

IN THE LONG ASSOCIATION between man and birds, few species have aroused more controversy than the Midway Islands' famous albatrosses. Coleridge's Ancient Mariner ascribed supernatural power to the albatross, but the modern mariner of the United States Navy respects it for more tangible reasons—particularly if he has served at the Midway Naval Station in the North Pacific.

He knows the two species that nest there by the thousands as gooney birds, or just gooneys. The gray-and-white Laysan albatross (*Diomedea immutabilis*) he calls "white gooney," and the sooty-colored black-footed albatross (*Diomedea nigripes*) "black gooney." And he has mixed emotions about these marvelous creatures with their seven-foot wingspread.

Gooneys Imperil Planes

On the positive side, the gooneys are a morale builder on one of the key military bases in the Pacific area. Playful Laysan albatrosses, resembling overgrown sea gulls engaged in ritualistic dances, provide more genuine amusement than the double feature at the Midway movie house.

Pro-gooney sentiment runs high in the Navy homes along Midway's iron-wood-shaded streets, where these magnificent sea birds build their shallow nests all over front lawns and back yards, in utter confidence. They are as much a part of the household as the family dog or cat, and anyone seeking to harm them would have an irate housewife to contend with.

Pilots and operations officers in Midway's control tower, however, see another side. These men sweat it out while the great radar-equipped picket planes, the Lockheed Super Constel-

lations of the Pacific Fleet's Barrier Forces, roar down the runway and take off through hundreds of soaring gooneys. Even before clearing the runway, a plane may hit a goose-size gooney and have to return for repairs, leaving a gap in the radar barrier of our national defense. It is only by great good fortune that so far there have been no crashes or loss of lives.

Two decades of battle between the U. S. Navy and the albatross have seen the use of just about every weapon short of the atomic bomb: clubs and flares and rocket-launching bazookas, smoke and ultrahigh-frequency sound waves. Since 1954 the Fish and Wildlife Service of the U. S. Department of the Interior has kept a team of scientists assigned to seek an agreeable solution to the problem. Agreeable, that is, both to conservation-minded citizens, who wish to see the birds preserved, and to the Navy, concerned about safety of personnel. As the man in charge of this project, I have become closely acquainted with Midway and its beloved but troublesome gooneys.

Midway's gooneys did not become widely known until Pan American Airways built a base for its trans-pacific clippers on the mid-Pacific atoll in 1935. A hotel on Sand Island was appropriately called Gooneyville Lodge, and a golf course received world-wide billing as the only one with gooney birds nesting on fairways.

The Navy's airfield, constructed shortly before World War II, played a vital part in turning the tide of the war in the Pacific. The gooneys took in stride the Japanese bombings during the Battle of Midway, as well as the elimination of many thousands of their kind by defenders striving to

The Gooney Birds of Midway

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PLANE AND ALBATROSS
*compete for airspace above
the Pacific's Midway Islands.*

Soaring gooneys cannot turn fast enough to evade craft over the naval airfield, and planes at take-off or landing also lack maneuverability. Result: collisions at closing speeds up to 200 miles an hour, often crippling the plane as well as killing the gooney. Collisions have cost the U.S. Government some \$250,000 a year. By coincidence, this plane is a Grumman amphibian called Albatross.

reduce hazards to aircraft. As Midway's postwar air traffic grew, the rate of bird-plane collisions became alarming.

When I arrived at Midway eight years ago, our plane hit two Laysan albatrosses. In the passenger cabin, I was unaware of the birds' impact until we landed and I heard of it from the flight crew. As unmistakable proof

they showed me the dents in the plane's wings.

I had landed in mid-November, when birds arriving on the nesting grounds swarmed in great numbers over the runways. During this season four out of ten planes operating in daylight hours struck birds. And about one in 15 collisions caused damage: broken windshields or antennas, dented radomes and cowlings; torn leading edges of wings and stabilizers; and bent propellers. Some seriously damaged planes came close to shooting off the runway and into the lagoon.

Albatross Families Refuse to Move

Nobody wanted to slaughter the albatross. We simply hoped to annoy the gooneys enough so that they would go away. But how? A report about a series of experiments conducted by Philip A. DuMont and Johnson A. Neff of our team made discouraging reading.

First they had tried smoke: Daylight flares drifted orange clouds over some 130 black-footed albatrosses that had not yet started to lay eggs. "No birds moved."

840 Next, a burning truck tire was placed near

five black gooneys sitting on eggs. All the birds were within six feet of the flame, which produced a dense, black cloud and an acrid stench. "One bird moved because of the heat but returned to its egg within a few minutes. None of the birds left the area."

Marines fired a mortar. "Birds no more than 200 feet from the mortar continued to sleep, and none of those nearer were seen to move away."

Bazookas did no better. "Birds on eggs within range of the backflash had feathers ruffled, but none moved."

Loudspeakers sent sound waves of varying lengths toward the gooneys. "No birds left the area," said the report, which indicated that gooneys are undisturbed by ultrahigh frequencies, though sonic research continues.

On the target range, gooneys nested in the line of fire. "One black gooney continued to sit on its egg 3½ feet in front of, and a foot below, a rifle muzzle."

Why do gooneys seem not to fear man or machine—at least not enough to be scared away permanently? Perhaps because they



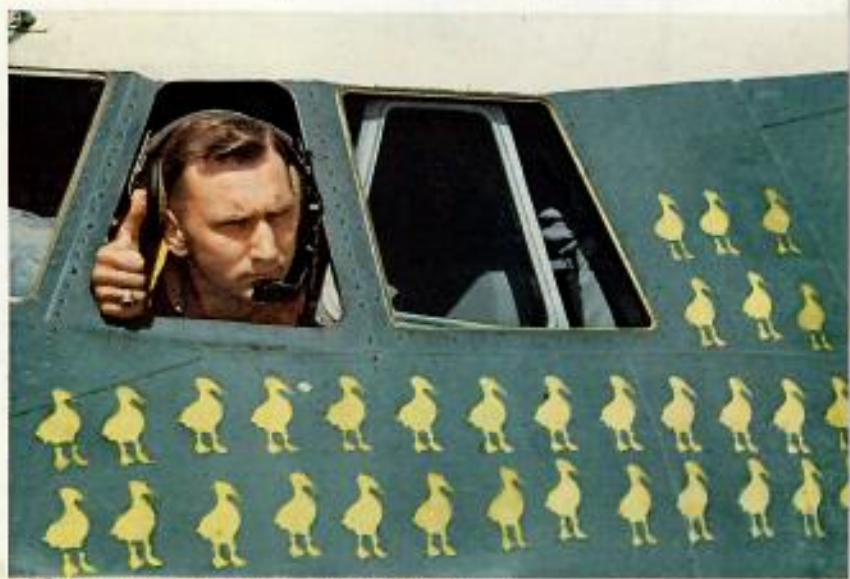


Effortless wings stretching seven feet from tip to tip, a Laysan albatross, or "white gooney," soars above Midway atoll. Graceful in flight but awkward on land, the albatross becomes an undignified gooney bird when it arrives at its nesting grounds.

Ignoring a four-engine neighbor, black-footed albatrosses, or "black gooneys," colonize a strip of sand near a Navy radar picket plane. Heads of chicks protrude above nests—shallow holes scooped in the sand.

Scratch 32 gooneys, says the tally outside the cockpit of a Navy plane. Though collisions have cost no planes or lives, they have canceled missions. On take-off, crewmen station themselves at windows to watch out for the wheeling birds. The more numerous Laysans constitute the major hazard. Antenna guy wires on Eastern Island also take a toll of birds—up to 50 a week in nesting season.

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ROSECHROMES BY ROBERT E. EGOSMAN © NATIONAL GEOGRAPHIC SOCIETY



ETHNOGRAPHERS BY ROBERT S. GOODMAN © N.S.P.



have had no enemies on the oceanic islands until relatively recent times. Man's first serious impact on the gooneys probably came with the Japanese plume hunters at the turn of this century, when the trade in feathers for ladies' hats was at its peak.

Feather hunters completely wiped out albatrosses on several North Pacific islands, but U. S. authorities stepped in before they could finish them off on Midway and other islands of the Hawaiian chain.*

At the end of World War II, a survey estimated Midway's Laysan albatrosses at 110,000 and the black-footed species at 53,000. A more recent estimate reported 200,000 Laysan and 17,000 black-footed gooneys, making Midway second only to Laysan Island—about 390 miles to the east—as a gooney nesting ground.

In view of this history, we knew that we were confronted with two species of wildlife lacking the usual nervous, or fear, responses. Before we could hope to propose ways to control the gooneys, we would have to find their Achilles' heel. This could only be done by a thorough study of the birds' life history and behavior. We realized that the task would take years and would require banding and observation of thousands of birds.

And so, soon after our arrival, biologists on bicycles were exploring every part of the great bird city. We grasped nesting birds by the neck—firmly, for gooney beaks can inflict painful wounds—and clamped numbered aluminum bands on their legs. Others we ran down before they could gain enough headway into the wind to take off (page 848).

Housewife Tips Off Scientist

Now, after ten years of study, we must list some experiments that looked promising at first but then failed to produce satisfactory answers.

For example, Hubert W. Frings, a professor of zoology at the University of Hawaii who investigated gooney behavior for the Office of Naval Research, heard from a sailor's wife that when she hung out her laundry the birds were frightened. Thereupon Dr. Frings kept walking toward gooneys

*See "Bird Life Among Lava Rock and Coral Sand," by Alexander Wetmore, NATIONAL GEOGRAPHIC, July, 1925.

Black-footed albatross (top) raises bill high and utters a cowlike moo during ritual dancing at the start of the breeding season. Gooneys also bleat like sheep, squeal like pigs, cackle like hens, twitter like songbirds, and shriek like children. Wings akimbo, the couple in center does a Midway mambo. Bill to bill, the partners at left bob heads in mutual admiration. Ornithologists believe that courtship inspires the displays, though the performances continue for months. Sexes look identical; hence bird watchers are unsure who is dancing with whom. Both species engage in such dances.



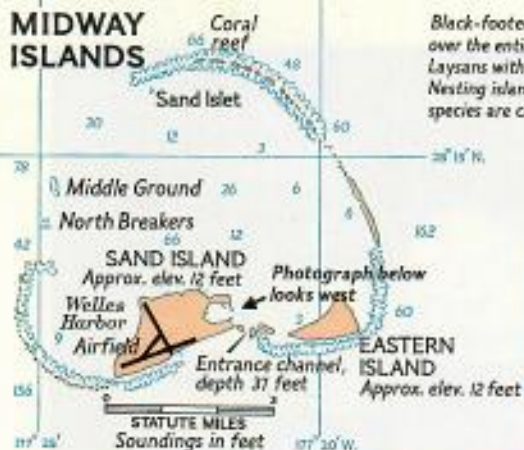
Flapping bed sheets, Navy men advance like bullfighters against nesting gooneys. Midway's naval commander ordered Operation Bed Sheet after ornithologist Hubert Frings found that the birds retreated before any large surface such as a coat, sheet, or cardboard. The orders sanctioned "any procedure which does not injure or kill the birds. Gooneys can bite hard, so beware of their snapping beaks." Like everything else, the sheets failed. After beating a strategic retreat, the birds quickly returned.

Refusing to budge from a grader's path, young gooneys force rescuers to carry them to safety. Grading levels dunes that create updrafts on which the albatrosses soar. 843

KODACHROME (BELOW) AND PENTACHROME BY ROBERT E. GOODMAN © U.S.S.



MIDWAY ISLANDS



Black-footed albatrosses occur over the entire flight range. Laysans within dashed lines. Nesting islands of both species are circled.



Downy chick peers from its nest. Albatrosses mate for life and lay one egg a year.

Site of battle between man and bird lies 3,200 miles west of California, 2,500 miles east of Japan. Coral Midway consists of a reef-sheltered lagoon, Eastern Island, and 1,055-acre Sand Island (below). It is one of several leeward islands of the Hawaiian chain that comprise virtually the entire nesting range of Laysan and black-footed albatrosses. Map shows present nesting and flight ranges.

The airfield serves as a steppingstone for transpacific flights and berths Navy picket planes, part of a radar early-warning system. In 1942 the atoll gave its name to the decisive Battle of Midway, in which Navy flyers destroyed four Japanese aircraft carriers.



KODACHROME BY ROBERT B. GODDARD © N.C.S.



while holding up large squares of colored cloth or cardboard. "Any flat surface moving toward them seems to make them panic," he reported, "especially red surfaces." But once the panic was over, the birds were back.

Next Dr. Frings tried a grid of electrically charged wires, ten feet apart and six inches off the ground. He found that no birds would nest in that grid, even after the electricity was turned off. But the grid was judged to be

more hazardous to humans than to the birds.

We tried two more noise-making schemes. First, carbide exploders. These are metal cans containing lumps of calcium carbide on which water drips, to produce a highly explosive gas. Every few minutes, automatically, a spark ignited the gas. The noise was like cannon, and it bothered lots of people on Midway. The gooneys just shook their heads.

And then there were taped distress calls, which received much attention from Dr. Frings. He had recorded sounds of birds in trouble and discovered that by playing his recordings he could scare away other birds of the same species. This technique had often worked with starlings. But the recordings to date have proved only mildly disturbing to Midway's black gooneys. To white gooneys, not at all.

Birds Forget How to Land

But we were not discouraged. We felt sure that continued banding and surveillance of gooneys would reveal the facts needed to control them.

We do not yet know at what age our two species begin to breed, but evidence points to seven years, more or less. Parents spend nine months of the year incubating their single egg and rearing their offspring. They spend the other three months at sea, gliding close to waves and occasionally alighting on the water as ducks do. They range the North Pacific from America to Asia and north into the Bering Sea, catching fish and squid, and sometimes following ships for refuse (map, page 844).

The gooneys start coming back to Midway late in October. This is a great event for the people on the island. After several months at sea, the birds apparently cannot remember how to alight on land. They have to learn all over again, the hard way.

In they glide from the blue Pacific, over the line of breakers on the barrier reef. Across the pale-green lagoon and the brush-covered dunes they come, along the beach, down the main street of the residential section.

Each heads unferringly toward the spot it has used for years for nesting. We have recaptured several of the first birds banded on nests near former Gooneyville Lodge—still laying eggs on the same site 26 years later.



Will mortars rout gooneys? Helmeted sailors prepare to fire smoke bombs against a large concentration. When the smoke blew away, the birds still held their ground.

Red smoke rolls from a hand-placed bomb among nests of black gooneys. The billowing stream turned some chicks red but caused no visible signs of annoyance. The troops retired from the field.

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EXTRACHROME BY ROBERT B. GOODMAN © NATIONAL GEOGRAPHIC SOCIETY

Rockets' red glare shows the gooneys still there. This experiment with flares fired by Very pistols proved the birds no easier to scare by night than by day. 847

The gooneys approach in a long, flat glide on motionless wings. Down go the wing and tail flaps, and the broad webbed feet.

But brakes aren't set soon enough. Touch-down speed is far too great. The landing gear collapses. The exquisite gliding mechanism becomes a disorganized spectacle of gyrating wings and disheveled feathers sprawling across the ground. New arrivals seem embarrassed as they pick themselves up to the noisy accompaniment of neighbors' squeals, groans, and clapping bills.

Both species of bird nest in colonies, but the black-footed albatross prefers the open beaches, while the much more numerous Lay-

san, or white, favors the shelter found at the edge of a clump of bushes or in the shade of an ironwood tree. Areas near runways offer many such protected sites, with the result that the Laysan suffers the heaviest toll from airplanes and is the chief menace to flyers.

Nest building differs, too. Both species scoop shallow depressions in the sand, but Laysans add weeds, sticks, and debris. The nest builds up as the incubating bird pulls in anything within reach. During storms the raised nests form little islands against the flood.

The egg is about four inches long, white or pale buff in color, and usually blotched with reddish brown. The parents sit on the egg by turns, one incubating while the other goes to sea to feed and drink, often for two weeks or more. The change-over is an amusing ceremony: The parent examines the egg closely and talks to it with a gentle cheeping sound before settling down over it.

The incubating parent never leaves the egg unattended, even though the bird may be buried up to the neck in windblown sand. It

Like a plane taking off, albatrosses need a running start upwind to get airborne.

White gooney wins a race with a leg bander, whose final lunge gets him a face full of sand instead of the bird. Navy men such as this young officer help ornithologists band albatrosses in a long-range study. Resulting knowledge about the birds' movements may help control and protect them.



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may lose a quarter of its weight for lack of food and sea water. (Albatrosses cannot remain healthy by drinking fresh water; special glands at the base of their bills secrete the excess salt taken by drinking sea water.)

The off-duty parent roams far over the North Pacific. A Laysan albatross banded while incubating an egg on Sand Island was caught three weeks later, 2,300 miles away.

Gooney Tries to Hatch a Tin Can

One afternoon friends invited us to a cook-out. Nearby, gooney birds sat serenely on their eggs, gabbling and going about their normal gooney business. They accepted us as

part of the colony. Even the family dog received no more attention than an occasional thrust of a bill, which he respectfully avoided.

We put gooney behavior to the test by substituting briefly a tin can for an egg. The patient parent sat on it with the same solicitude it had shown for its own egg, simply shifting about more than usual in quest of comfort.

Albatross chicks appear in January, after about nine weeks of incubation. For the first two or three weeks of its life, each chick is continually attended by its parents, one of which forages for food far out over the sea while the other takes its turn at the nest. The young albatrosses are fed by regurgitation,

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KEOALOHONE BY ROBERT E. GOERMAN © NATIONAL GEOGRAPHIC SOCIETY



placing their bills inside those of their elders.

In summer the fuzzy chicks reach full size. The parents' feeding visits tend to become fewer and finally stop, and the young, having exercised and tested their wings in the wind for weeks, take off alone over the ocean.

Probably at least two years will elapse before the young again set foot on dry land, and another four to six years before they nest.

Albatrosses possess an extraordinary homing ability. Two of our team members, Dale Rice and Karl Kenyon, banded 18 Laysan albatrosses and shipped them by air to distant points in the North Pacific. Fourteen returned to their nests on Midway. One, which had been released in Puget Sound in Washington State, covered 3,200 miles in 10 days. The

long-distance record was a 4,120-mile flight from the Philippines, in 32 days. We abandoned all idea of exiling nesting albatrosses from Midway to other islands.

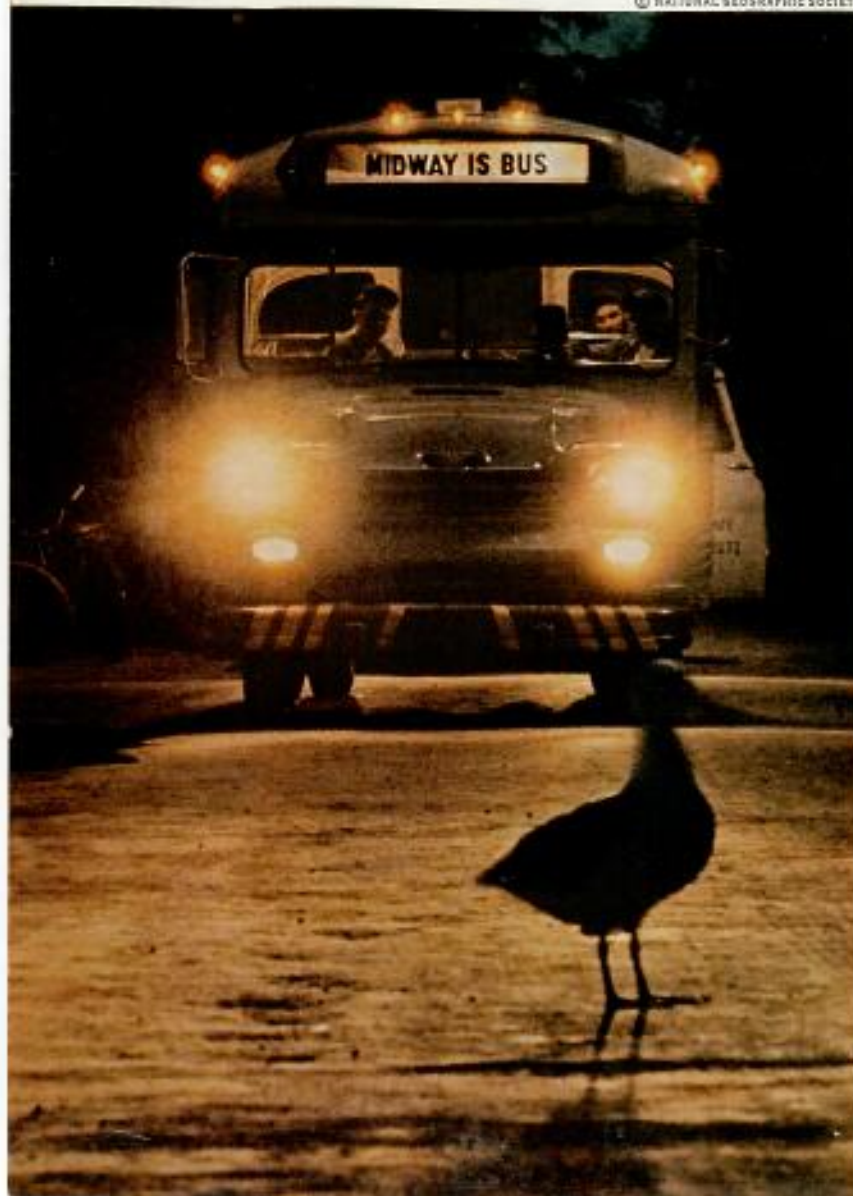
As a step toward control, we determined to find out which segments of the white gooney population presented the most danger by soaring over the runways. We zoned the Laysan albatrosses on Sand Island according to the distance of their nest from the runways. One of us held the birds while another painted aniline dye on their breasts.

Gooneys nesting within 750 feet of the runway we dyed violet; those at a greater distance, green; birds from the still farther distant residential section, yellow. Those two miles away on Eastern Island, we dyed red.

Gooney brings bus to a halt. Birds get in the way of everything on Midway. While coming in for landings, they sometimes spill and injure cyclists. But the islanders enjoy their antics.

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We discovered that two-thirds of the dyed birds above the runways came from nests within 750 feet. Half of one percent came from the residential area. Only one red-marked bird came from Eastern Island.

We found, too, that albatrosses whose eggs had been destroyed now appeared far more frequently over runways than before. Deprived of their eggs, they made no effort to reneest. They simply cruised aimlessly about. We calculated that these unemployed gooneys constituted a hazard to aircraft five times greater than nesting birds.

At one stage we considered reducing the nesting population, or at least eliminating the group shown by our color marking to be the greatest hazard to the planes. In an experiment, albatrosses were eliminated from a zone on each side of the most frequently used runway. But to our surprise, the number over the runway *increased*.

The explanation seems to be that non-nesting birds, seeking homesites, were attracted by the depopulated strip of land in

a thriving gooney colony. And since they were not yet tied down to nests or young, they spent most of their time cruising about over the area. We abandoned this reducing plan.

We kept looking for exploitable characteristics of the albatross. At last we found the clue.

Gooneys seemed to concentrate over portions of runways bordering uneven terrain. Level areas had relatively few gooneys overhead. When the significance of this dawned on us, we intensified our surveillance.

For several years, team members Karl Kenyon, Dale Rice, and Chandler Robbins observed patiently. The conclusion was inescapable: Albatrosses tend to soar over dunes and old wartime revetments. These deflect the nearly continual winds upward, producing air currents ideal for gliding.

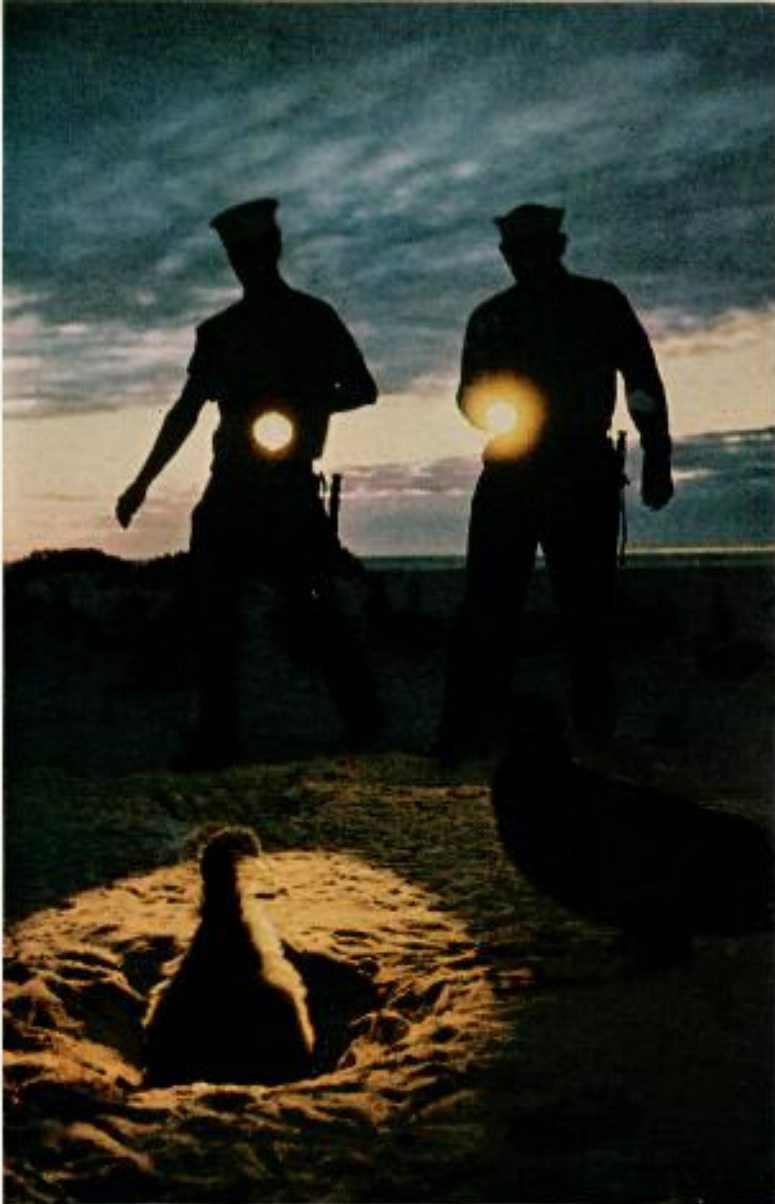
If all the land adjoining the runways could be leveled, we reasoned, the hazard to aircraft caused by flying gooneys would be very much reduced. Furthermore, if we prevented nesting for some distance from the runways—by hard-topping the surface—we would decrease bird flights over those areas.

Seabees leveled and black-topped a stretch alongside the most frequently used runway, where soaring gooneys were numerous. Studies by Chandler Robbins immediately showed fewer bird-plane collisions over that runway.

Thus the Navy arrived at its answer to the problem: Level and pave broad strips within 750 feet of the center of each runway. Unfortunately, birds nesting beside the runways would have to be eliminated; otherwise the homeless gooneys would soar aimlessly over the traffic zone, increasing the hazard.

In January of this year some 17,000 birds—mostly Laysans—were eliminated from strips near runways. Seabees began leveling and paving, a task that should be finished this fall. Only then can we evaluate results.

Carl W. Buchheister, President of the National Audubon Society, observed the bird-strike problem on Midway at first hand as a guest of the Navy.



EXTRACTED BY ROBERT B. BOGGMAN © NATIONAL GEOGRAPHIC SOCIETY

Bed check by gooney patrol finds birds nesting peacefully. Not everyone loves gooneys, so the Navy tries to curb vandals.

"Continued research is needed if Midway is to remain a nesting site," he said. "And the Hawaiian Islands National Wildlife Refuge, four islands of which could accommodate half a million birds, must be held absolutely inviolate [map, page 844]. The future of these two species depends on it."

The Navy's measures affected about 7 percent of Midway's Laysan and 11 percent of its black-footed albatrosses—less than 1 percent of the world population. Midway's other birds are welcome to their accustomed nests.

Thus Navy families along Nimitz Avenue will enjoy seeing their gooney birds return each autumn. And the airmen appear to have won, at least temporarily, in the Navy's war with the gooneys.

THE END 851

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