



One of 1,500 left, a shy Hawaiian monk seal flashes through a coral

Last Refuge of

By DIANE ACKERMAN



sea in the Northwestern Hawaiian Islands, its only sanctuary.

the Monk Seal

Photographs by BILL CURTSINGER

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IN DAYDREAMS I have seen the monk seal's face: a bulbous head covered in silvery fur, with black buttonhook-shaped eyes, a snout on which springy nostrils open full like quotation marks, tiny slot-shaped ears, a spray of cat's whiskers, and many doughy chins. On land, it drags itself with excruciating effort, or ripple-gallops like a 400-pound slug. But the water sets it free to swivel and race. Powered by twin flippers at the rear, its torpedo body can outmaneuver a shark. Books say it grows as long as seven and a half feet, but the photographs show distant and indistinct creatures. There are no cozy details—the touch, the smell, the sound, the expressions.

Monk seals, which once swarmed through the Pacific, Caribbean, and Mediterranean, now teeter on the edge of extinction. One of their last havens, French Frigate Shoals, is a horseshoe spill of islets and sandspits in the Hawaiian Islands National Wildlife Refuge.

To discover what these seals look and feel like and to record their ways, I'm flying there in a small plane with William "Gil" Gilmarin, leader of the National Marine Fisheries Service monk seal project, and Bill Curt-singer, a NATIONAL GEOGRAPHIC photographer. For a week we'll be a team, tagging new pups and checking the health of adults.

French Frigate Shoals drifts below us. Behind the thin white petticoat of its surf line, a long comet of aqua stretches into the Pacific. Most of the ocean corralled by the atoll is shallow with a sandy bottom. A few islands seem large enough to house a small building, but others are tiny as sandboxes, and from time to time they actually disappear.

This is the fragile world of the monk seal—a "living fossil," as some have called it, a seal so ancient, rare, and shy that it seems almost mythic. It was the first pinniped ("fin-foot," for members of the seal, walrus, and sea lion order) recorded by Aristotle, the first seal spotted by Columbus in the New World. Shore loving and exploitable, monk seals soon were slaughtered in droves. The process of their extinction continues right now. The last recorded Caribbean monk seal was seen in 1952. I was four years old, growing up in a small town in Illinois, playing in the plum orchard across from my house, learning to count. I didn't know that an animal that had survived for 15 million years was at that moment becoming extinct.

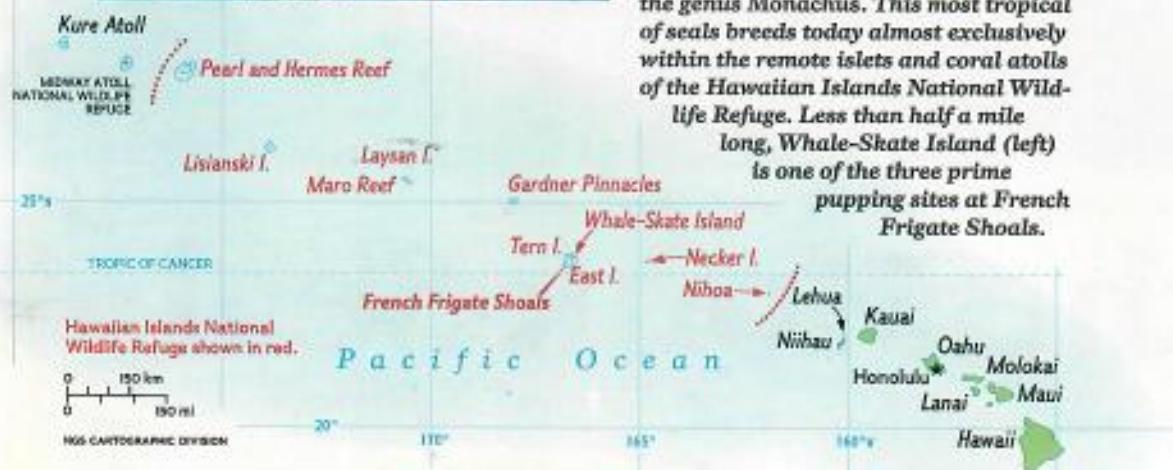
We touch down, and in a cyclone of birds we come to rest at last before a long barracks. Outside it a plaque reads: "Tern Island, French Frigate Shoals. Population 4."

Soon after, Bill, Gil, and I rendezvous at the boat dock, where we use an electric crane



The monk seal's shrinking world

Undaunted in its home waters, a male monk seal (right) races after a potential mate near an undersea pinnacle at French Frigate Shoals. With the Caribbean monk seal almost certainly extinct and the Mediterranean species reduced to fewer than 500 animals, the Hawaiian population represents the best chance for the genus Monachus. This most tropical of seals breeds today almost exclusively within the remote islets and coral atolls of the Hawaiian Islands National Wildlife Refuge. Less than half a mile long, Whale-Skate Island (left) is one of the three prime pupping sites at French Frigate Shoals.







A furious face-off erupts when a male intrudes on a mother and pup near shore. Bellowing and biting, the mother repelled the advances. Pups often lose contact

to lower an orange Boston Whaler into the water. Our first stop today will be slipper-shaped East Island, seven miles southeast of Tern, which once held a U. S. Coast Guard station. The ocean heaves and rolls. After a bone-jarring, wave-leaping ride of 30 minutes, we see a bright doily on the horizon. Composed entirely of coarse coral sand and pulverized shells, East Island is only about 2,000 feet long, 300 feet wide, and it doesn't rise more than eight or ten feet above the sea. A brisk storm could dash waves right over it. Masked boobies, sooty terns, and Laysan

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albatrosses fly out to greet us as we pick our way among the coral heads, at last settling for a spot on the lagoon side of the island.

A tall pole once used as a radio antenna stands near the middle of the island, and I follow its hour-hand shadow down to the beach, where it falls across the flanks of a large monk seal.

Browner than I imagined and molting in patches, the seal looks a little like an old horsehair couch someone has left by the curb. Its belly glows a pale chamois color, and its chest is green from algae. Lying placidly with its muzzle half-buried in sand, the seal snoozes as incoming waves swirl around its face, sudsing its whiskers. After the seal inhales and exhales three times in a row, its chest stays motionless for ten minutes. Then, lifting its heavy head, it sneezes loudly with a



with their mothers during adult fights and end up in the care of other females. A pup may nurse from two or three different females before weaning.

wild twisting of the neck and settles back on the sand with a loud *harrumph*. Monk seals suffer from nose mites, which seem to give them terrible sinus problems. So they sneeze often and loudly.

Two pups appear in the surf and start playing rough-and-tumble. I assume that such play teaches them skills needed for mating or fighting. Gil isn't sure. Little is known about the courtship of monk seals. The actual mating takes place offshore and is rarely seen. In fact, the first documented instance occurred as recently as 1978.

Strolling past a low dune, we come upon six large seals lying parallel in the sand, sleeping. Their sheer size and mass are surprising.

Now a smaller seal, sleeping in the middle of the island, takes a few breaths, wakes up, and steam shovels its way closer to the water,

digging a long trench as it goes. Because they feed at night, monk seals bask in the blistering heat of the day, but they do like to dig down to a cool, damp layer of sand. In many places we find "tractor paths" left by seals that have dragged themselves to the water.

GIL BENDS HIS KNEES, rounds his shoulders, and sneaks up closer to the sleeping monk seals, checking to see if any are pups in need of flipper tags. The information researchers glean from tagging helps to chart the life cycle and movements of the animals and the progress of the rehabilitation program. Turning back toward me, he points to a small dark seal right at the end of the row. Monk seals molt each year, and for a while their new fur looks slate black: This is



most likely a pup that's gone through its first molt. Opening the white tagging bucket, I remove a leather belt punch, two fraying kneepads, paper and pencil, a tape measure, and two numbered yellow plastic flipper tags. The color stands for French Frigate Shoals, the letter code tells which year the pup was tagged, the number identifies the individual. An open jaw about an inch long, each tag has a small knob at one end. Holding a tag in the air, I rehearse the best wrist action for forcing the knob through the punched hole in the seal's skin and tugging the device into place.

OK, I nod to Gil and creep up behind him. Stealthy and alert, he hunkers down like a predator and sneaks right up behind the seal, climbs decisively onto its back and grips its cheeks in both hands. Waking with a loud gargling *Baah!* the seal begins rolling and squirming as I rush in, fall to my knees behind its tail, and try to catch the twin flippers flailing around in such confusion that it's hard to tell left from right. I grab one out of midair, press it flat on the sand, while the other smacks my face. Sliding the tagging punch along the webbing between the first and second finger-like digits of the flipper, I find a good spot, press hard, and nothing happens. The seal struggles and complains. Then, leaning all of my weight into my

hands, I push again and this time hear the click of metal on metal and know the punch has gone through. I remove it. The seal smacks me full across the face with its flipper, raking blood from my forehead down to my mouth. Quickly, I grab the left flipper, press it flat on the sand to get my bearings, find the inside digit's webbing, slide the punch in about an inch and a half, and bear down again with my full body weight, straining from the effort. At last, metal clicks against metal.

"How ya' doin'?" Gil calls from in front. Straddling the seal's back, he's not actually sitting on it but bracing it with his long legs, pinning its front flippers with his knees. Gripping its chins, he holds its sharp teeth away from him, which also keeps the seal oriented belly-down.

"Done!" I call to Gil. Its wet fur smells chalky sweet, as the seal complains in a loud steady basso gargle. It eyes me warily. What big black eyes and long stiff whiskers. It has a cleft in its nose just like a cat and a soft cream-colored overbite. *BAAAH!* Its resonant gargle seems to come from a great distance by way of an echo chamber.

"Under the flippers!" Gil urges.

Watching out for the teeth, I slide the tape measure under the seal's chin, under the



Beneath the notice of passing rudderfish, a seal uses a coral cave to hide from its worst nightmare—sharks. Researchers have witnessed attacks by both gray reef sharks (above) and tiger sharks. Seals are thought to rest in reef caverns after feeding at night on lobster, octopus, and fish. If pinned down by a cruising shark, a monk seal may wait out the menace by drawing air from bubbles it has exhaled inside the cave.

chest, and over the back behind the flippers.

"109.5 centimeters."

"That's it," Gil says, climbing off. The seal rolls onto one side, facing us, and paws the air with a flipper. As it does, we see four tiny nipples halfway down its fawn-colored belly, and a vaginal slit right under the tail.

Female. A precious pup. A grave threat to monk seals is how few females remain—too few for the species to flourish. This imbalance has so upset the workings of nature that males are resorting to a bizarre and ruinous behavior. On two of the main breeding islands, where the number of females is unusually low, a grisly phenomenon called "mobbing" takes place. More than 25 males may attack and try to mate with one female. This may take several hours, during which time they gore the female's back, slashing the skin off, ripping the blubber right down to the muscle, in some cases even exposing the spinal column. Savaged, the female often dies from her injuries or from shark attack.

Of all the hazards facing monk seals, the toughest to outwit may be their own rash

instincts. Female monk seals would not normally be slaughtered during mating; it's only because so few are left that the species is being sabotaged by frenzied males. Therefore every female monk seal must be protected. Mobbing is so acute a problem that the monk seal project has begun testing a treatment program to calm the males. The idea is to reduce aggressiveness in the most violent offenders by injecting them with a testosterone-suppressing drug. If the experiment at Sea Life Park near Honolulu works, it could hold promise for curbing the deadliest males long enough to bring the ratio of males and females back into equilibrium.

Moving to a polite distance, we watch the newly tagged pup roll over in the sand and return to basking as if nothing very special had happened. Gil is pleased to find a female pup that's fat and healthy and full of spunk.

"How do you know which males to treat?" I ask, as we put the tagging gear back into the white bucket.

"It's important that we don't treat the dominant breeding males," he explains.



"The breeding males probably give the females some protection from the groups of attacking younger males. The program seems to be working on the test animals. The next step is to go into the field with the drug and treat about 50 males at Laysan, one of the two islands where mobbing is the worst."

FROM A DISTANCE East Island had appeared flat as a sand dollar, but its gentle dunes rise high enough to hide sleeping monk seals, and, as we continue our walk, we chance upon many more of them lying peacefully in the surf, always facing out to sea.

Are they being watchful, I wonder? Are they oriented toward incoming sharks? Or do they just relish the feel of the waves, lapping at the whiskers, skirling around the muzzle, sudsing the nose? Unlike other seals, which tend to crowd, monk seals don't form large groups. They're more solitary, and they haul out alone. Today the seals occupy all the beaches, but in the spring the mothers nurse mainly on the south side of the island, where waters are too shallow for sharks. Ten- to sixteen-foot tiger sharks patrol the waist-deep water of the north side, on the lookout for wayward pups or birds.

We approach the antenna mast, which stands like a lightning rod. On it, a sign reads National Wildlife Refuge. What is it exactly that the seals, turtles, and birds need refuge from? Predators? A changing environment? Us?

A few monk seals still inhabit the Mediterranean, but vanishingly few, and they're rarely glimpsed. Too many governments have divided up the waters of the Mediterranean monk seal to make organized research feasible. And, in any case, monk seals are rattled by human doings—motorboats, airplanes, fishing, tourists. The best hope for the entire genus *Monachus* lies with the remaining Hawaiian monk seals, which have found a remote hiding place. But even these seals are vexed by problems.

All the monk seal wants is to continue

living in the ancient seas for which it's designed. But those waters are gone now. Pollutants, plastics, and fishing lines ride the waves, and hominids stomp along the beaches or race across the reefs. Occasionally a pregnant monk seal does haul up onto a fashionable beach on one of the main Hawaiian islands. Ironically, although tourists may lie happily for hours, broiling in the sun, when they see a monk seal doing the same thing they assume it's stranded or in trouble, and they chase it back into the ocean. That simple act—hazing it back to sea—may kill it and its young.

Monk seals choose a beach carefully, judging terrain and shallow water. Frightened by humans, a seal will look for another pupping spot, one with fewer people, even if it means a less ideal landscape. A female monk seal needs a shallow crib for her youngster right offshore, where she can protect and nurse it.

The islands of French Frigate Shoals do not look like a refuge. In fact, they themselves seem in need of dredging and bolstering. The refuge sign identifies not a place but



Powerless to help, biologist William Gilmartin, director of the Monk Seal Recovery Project, looks sadly at a pup certain to die after a shark attack (facing page). On a brighter mission, Gilmartin and the author tag a newly weaned pup at French Frigate Shoals. Because of nursing monk seals' extreme sensitivity to human disturbance, admission to the refuge is strictly limited.



a willingness, a stubborn protectiveness.

Below the refuge sign sits a white wooden box with a latch door. I open it. Someone has tacked up a poem—"Walk Softly"—to celebrate the sacredness of the place. Inside the door, photographs show the original Coast Guard base. Small beetles scuttle over the photographs, and for a moment the base seems to be bustling with life. The white skeleton of a spider blows across the hinge.

A MASKED BOOBY flies over, and the ocean reflects pale blue across its chest as it glides low and lands near two mother seals with their three-week-old pups.

Waiting in the shallows, another mother calls to her snoozy pup, and the baby *baahs* back in a slightly higher register, then waddles into the water and darts to her, otter fast. Monk seals make quirky sounds—from stuttering grunts to high foghorns—with mothers and pups sharing the greatest range of calls. Some seals have one or more tiny patches of blond fur, which glisten in the sunlight. Such

curious markings help identify individuals. Could there once have been blond or even spotted monk seals?

"Oh, look at that," Gil says, wincing. I follow his gaze to a pup that has lost one rear flipper. A shark has chewed it clean away, leaving only a thick red stump.

"God, I hope it's not a female," Gil says. "If it is, we'll have to catch her, carry her to the boat, take her back to Tern, and fly her to Honolulu. Maybe she could be treated there and used for breeding." As it turns out, the animal is a male, which vanishes silently into the sea again.

In 1991 Sea Life Park had six females in the rehabilitation program. In the late 1970s, researchers discovered that monk seals practice "fostering." When nursing mothers come too close to one another, a fight may break out, and it's likely that the mothers will exchange pups. They either can't tell whose pup is whose, or they don't care. At first glance this altruism may seem helpful. If there are few members of a population, isn't it smart for everyone to look after the young?



Shallow, shark-proof waters allow a mother and black-furred pup to swim safely as they cool off from the tropical sun. Before returning to its basking beach, the youngster investigates the engine casing of a boat. Once the mother leaves, after five to six weeks of nursing, a pup is thrown upon the sea's mercy without knowing how to feed itself. It may drop a third of its weight before learning to catch fish.



Last Refuge of the Monk Seal

But mother monk seals can't continue nursing forever. When a swap occurs, a younger pup may end up with a mother that has been raising an older pup. That mother would already have been nursing for some time and may not have enough milk left to raise the young pup. Weaned too soon, the undersized pup would not be able to feed itself. Those are the animals the monk seal project takes to Honolulu to fatten up. Then they're released on Kure Atoll where the population is low and there are too few females. Twenty females have been rehabilitated and returned to the wild since 1984, and 15 are still alive.

"A few other small seals we collected died—primarily of heart problems of unknown origins," Gil explains as he sits down on a large blue fishing float. "In the beginning we assumed all they needed was fattening up, but some have health problems we can't deal with. In a wild population you always find some animals with health abnormalities." In a large herd, sick animals would not be missed, but in a dwindling herd, they're obvious and daunting.

When Dale Rice and Karl Kenyon counted the seals in the late 1950s, they found approximately 1,200 on the beaches of the Northwestern Hawaiian Islands, and it's believed that the total population size was two and a half times that, since all the seals don't use

the beaches at the same time. By 1976, when the monk seal was listed as endangered, the beach counts had dropped by 50 percent. The French Frigate Shoals population, stable during the 1980s, has suffered a catastrophic decline in the last two years: Beach counts are down by 25 percent.

PERHAPS THERE never were many monk seals in the Pacific. This is not true of the Caribbean, where Columbus encountered tawny brown monk seals in 1494 on his second voyage and called them sea wolves. In 1707 a West Indian traveler wrote: "The Bahama Islands are filled with seals. Sometimes fishers will catch a hundred in a night." The Mediterranean monk seal gave its name to an ancient city, Phocaea, in Asia Minor, and, as late as the 15th century, was plentiful enough to fuel a commercial fishery. But how many monk seals did the Hawaiian waters support? Were there great rookeries of them or only small strongholds? Did their extinction begin many millions of years ago, when they failed to adopt the harem-keeping that other seals find so successful? We may never know.

What could be more serene than sitting on coral sand while the sun mounts the sky, the monk seals bask, and the breeze blows the



surf into a gentle lather? For a moment there's no sign of all the commotion taking place to save these last few seals.

At Sea Life Park, every day, handlers drain the water from the orphan seals' pool, hold them down on special pads, and force-feed them whole fish. Orphan pups are too young to feed themselves. We think of hunger as a universal drive and teacher, but the pups don't even understand that they must eat, and sometimes they starve.

At Kure Atoll, a constellation of sandspits to the west of the refuge, there is an enclosure where pups are fattened up and taught to feed on live fish before being turned loose.

Part of what makes monk seals so challenging to the people who work with them is how many different problems they pose. There is the mobbing, the fostering, the human interference, the entanglement in fishing nets, the reluctance of pups to feed, the dwindling populations in some islands but not in others. This morning alone, we have tagged three pups, been ready to transport a shark-bitten animal, kept a sharp eye for pups inadvertently orphaned by fostering, seen a victim of mobbing. It's animal by animal that a species is saved.

Only 16 years ago, Hawaiian monk seals were considered disposable by some officials in the National Marine Fisheries Service.



On shore leave near Honolulu, an orphaned female pup relaxes at Sea Life Park, where she fattens up. Too young to feed on her own, the pup is force-fed herring (above). Six female pups a year are airlifted here for emergency help. Most are returned to the wild with the urgent hope—in some cases already fulfilled—that they will breed pups of their own.

Last Refuge of the Monk Seal

They insisted that the seals were a "relict species," as they put it, unsavable, a waste of time and resources. Outraged and saddened, John Twiss, executive director of the Marine Mammal Commission, argued hard for the protection of these animals and for their listing as endangered. When NMFS refused to undertake conservation programs, he pleaded directly with Congress, which gave the commission money for research and required NMFS to carry out a program to preserve the monk seal.

"It's possible that we will be successful," Twiss told me, "it's just possible."

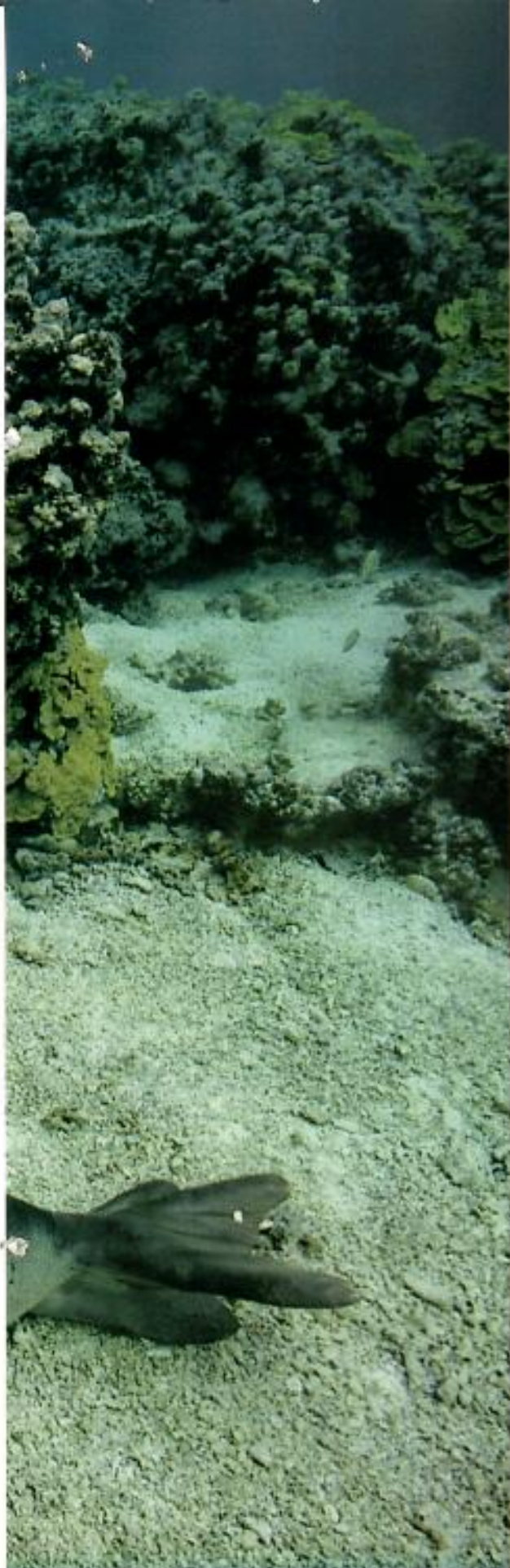
ALARGE MALE MONK lifts its head, cocks an eye at us, snuffles, puts its head back on the damp sand, and closes its eyes. I wonder what they make of us shy humans strolling along the dunes, taking care not to disturb their slumber.

Collecting our gear, we return to the whaler and set out for Whale-Skate Island. Actually it's composed of two islands: plump, curving Whale and tiny, semidetached Skate.

As we inch our way to shore, a pup swims out to greet the orange whaler. So much shimmery orange must intrigue it. Slipping over the bow, I carry the anchor ashore, plant it, and wade back to the boat. The pup paddles toward me, and I sit down in the water, shoulder deep, to look smaller and less threatening, as it sneaks in close, twitching its nose and having a good look-see. For long seconds it stares hard, and I talk to it in a high voice (I've noticed that most animals are more threatened by low voices). Casting a few more glances over its shoulder, it turns to grab an empty bottle in the waves, tosses it in the air, nudges it with its nose. This pup doesn't need to feed itself yet, but it's never too early to practice. What feeding monk seals usually do is dive down 25 to 150 feet on the reef, find a spiny lobster, and slap it on the surface to break it, then eat just the succulent tail. Their diet also includes eels, octopuses, and some reef fishes. Popping its head up in the periscope-like way that seals do, the pup watches us, then has a rollicking good sneeze.

A mother monk *baahs* to her black pup, which *baahs* back. For 40 days she will tend her pup without eating. During that time the pup will gain from 125 to 175 pounds, but the





mother may lose 300 pounds. At last, scrawny and famished, she'll go out on a feeding binge, then find a mate, and begin the cycle again. Next she'll spend seven to ten days molting, during which time she'll fast once more. We discover several slender nursing mothers on Whale-Skate, and a few fat new pups to tag.

Afternoon begins rouging toward sunset as we pack up and start back. Reflecting the shallow water, green-bottomed clouds float above us. But all the horizons are thick with clouds, wrapping around us and straggling high to where gauzier clouds stretch. It's like sailing through a planetarium. Soon Tern Island appears, and we put the whaler away for the night.

OUTSIDE MY bedroom window, four monk seals laze in the shade of bushes clotted with brown noddies. One seal twiddles its rear flippers. Another lifts its head and splutters a baritone phrase that sounds like *Bogs on Bogs on Bogs*. A third rolls over, stretches its cream belly longer and longer. The fourth, vexed by a bird, nips at it, then crawls under a tree heliotrope. A male booby whistles, as if through badly fitting dentures. All of a sudden the wedge-tailed shearwaters, or "wedgies," begin moaning—just a few at first—then urgent throngs of them as night pours its India ink into the shoals.

As the days pass, we rise in darkness, dress by moonlight, and set sail as the sun begins bluing up the atoll. Few things are sweeter than the cool damp morning of a scorching day on the ocean. We return often to East Island and Whale-Skate, two prime pupping islands, and always find new pups to tag, new adults to inspect at Gin Island, Trig Island, Shark Island, Round Island. It's only with the greatest reluctance that we pack our gear and leave French Frigate Shoals.

A healthy young monk seal makes a stand in the outer Hawaiian Islands. Just as the numbers at French Frigate Shoals were stabilizing, disaster struck: Long-liners in search of swordfish have injured and possibly killed seals with their hooks. Pupping rates have also fallen. Says Gilmartin, "The Hawaiian monk seal needs our constant attention."

Islands bloom on the horizon as we fly in a small plane straight toward the heart of the Hawaiian archipelago. We pass over Niihau, a large privately owned cattle ranch. Monk seals haul out on the island's beaches, but its owners won't allow researchers to step ashore to monitor the seals; no one knows how many use the island, what sex they are, or if they're healthy. A little later we land in Honolulu.

Bidding farewell to Gil, Bill Curtsinger and I fly to Kauai and rent a boat to take us out to Niihau. Even if we can't land on its beaches, we might be able to glimpse monk seals from offshore.

ACROSS THE CHANNEL from Niihau, the towering crescent of Lehua looms smooth and brown, with white specklings of guano. Long ropy fingers of frozen lava stretch down its sides to the sea. Only one cloud haunts the Wedgwood-blue sky—a large oval hanging directly over the island looks like a scar left by a knife wound. We head for the crescent's shallow reefs, to snorkel in one of several spots favored by divers. Seabirds work the thermals, and the ocean pours metallic blue and green as we drop anchor on the south side about a hundred yards from shore. Here we find an oystershell-shaped cave, partly above water, with a small lagoon in front of it. Sunlight dances like flame across the roof of the cave. Putting on a mask and fins, I slide over the side into 20 feet of water.

Heading for the lagoon, I enter into a small commotion of water and light. The surf frets the entrance. Ahead of me, through a curtain of bubbles, a long gray shape maneuvers, just out of range.

Suddenly it turns, comes closer, and stops six feet in front of me. Staring me straight in the face is a large monk seal with black eyes and thick whiskers. Eyeing me carefully, it pauses, then dives under me, rolling over as it does, comes up in back, eyes me again, and swings to my right. It doesn't seem to be using its flippers at all, and barely moves its body, and yet it darts around effortlessly.

Two more seals appear from the bubbles, rolling tightly together. Then another monk seal swims underneath me, looking up at me the whole time by turning its neck around like a ball turret, swimming forward but

looking backward. Then it turns slowly and swims toward the cave. Now the tussling couple reappears, biting and chasing each other. If I could rub my astonished eyes, I would, as five adult monk seals swim around the lagoon, in front of me, in back of me, at the surface, below me.

By now I am able to identify the couple as male and female. Occasionally they surface and *bark* loudly at one another; then the female slips away and the male joins her in a swirling subterranean dance. Bubbles trail from them like comet tails as they glide and spin, occasionally swiveling their necks to nip and bite. Before I have time to think, a new drama unfolds. The female dives to a jagged corridor of rock at the bottom, which is just wide enough to hold a seal. The male follows her at speed, bites her flank, her tail, then tries to reach over the sharp rock. Huddled tight as a letter in a slot, the female pulls in her head and tail. At last, the male sees an opening, grabs her back below the neck and drags her out, forcing her belly-down on the sandy bottom as he mounts her. She goes suddenly passive. It lasts only a minute, but to me it seems ages, as I float above them, frozen in amazement.

I am watching monk seals mate, I tell myself twice, as a complete sentence, because it is an astoundingly rare event to behold. Most likely the pups I saw wrestling in the surf at French Frigate Shoals, tumbling and nipping like this adult couple, were practicing courtship. When the male releases his grip, the female bolts, and he chases her. They surface and one of them barks a short gargling protest to which the other answers with a loud foggy bleat.

After watching them for a good long spell, I fin back to the boat. Darkness is falling. When we hoist anchor and set sail for Kauai, we salute the sea cave. Two monks are still swimming somewhere inside it. One large adult, hauled up onto the rocks rimming the lagoon, dozes peacefully near a pup. The courting couple continues swiveling tightly together among the coral heads. Over and over they roll, spiraling gracefully through the water. Standing at the stern as the boat gathers speed, I watch until the crescent island grows shorter, the shining monk seals become indistinguishable from smooth wet stones, and all that's left are the indecipherable gestures of the sea. □



NATIONAL GEOGRAPHIC

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Search for Columbus

By Eugene Lyon
Photographs by Bob Sacha



What forces shaped Columbus and spurred him to brave treacherous seas to seek the Indies? Old manuscripts hold a key to the mystery of the great mariner.

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La Isabela, Foothold in the New World

By Kathleen A. Deagan
Photographs by James A. Sugar
Paintings by Arthur Shilstone



Columbus's first New World town was abandoned after only five years—doomed by dissension, disease, and famine.

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Africa's Skeleton Coast

Article and photographs by Des and Jen Bartlett



Sustained by desert springs and Atlantic fog, an unlikely group of plants and animals cling to a thin line of survival in Namibia.

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Miami

By Charles E. Cobb, Jr.
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U.S.S. Macon: Lost and Found

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In 1935 a 785-foot Navy dirigible crashed off California. A fisherman's catch leads sleuths to the Macon's murky resting-place.

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Last Refuge of the Monk Seal

By Diane Ackerman
Photographs by Bill Curtsinger



Counting success one animal at a time, wildlife biologists on distant Hawaiian atolls work to save the rare and reclusive monk seal from extinction.

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COVER: Maneuvering off the Spanish coast, reproductions of the Pinta, Santa María, and Niña prepare to sail in the transatlantic wake of Christopher Columbus. Photograph by Bob Sacha.

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