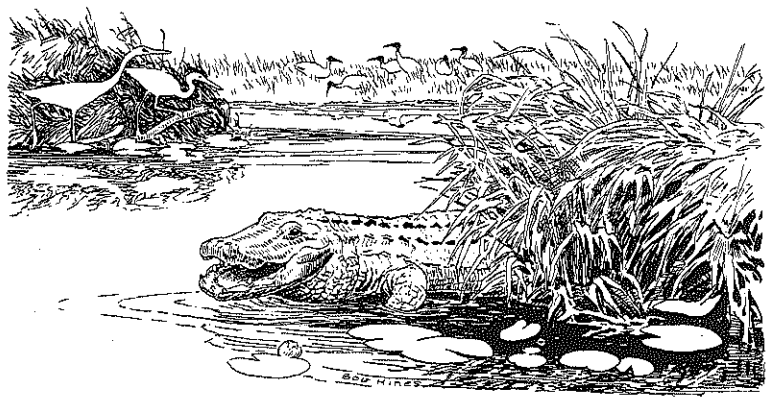


The sight . . . is a pleasure not able to be expressed with tonge . . . full of herons, corleux, bitters, mallardes, egertes, woodcockes, and of all other kinde of smale birdes, with hartes, hyndes, buckes, wild swyne, and sondery other wild beastes as we perceved well both then by there foteing there and also afterwardes in other places by ther crye and brayeng which we herde in the night tyme. . . .
—Jean Ribaut (1563).

2 : The Tropical Border

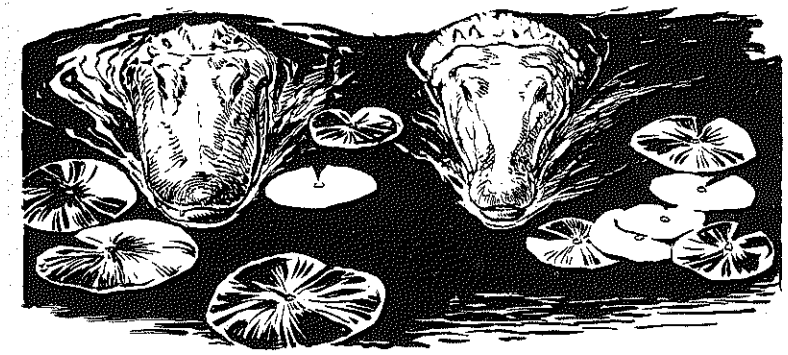
The Spaniards who extended the explorations of Columbus to the mainland were greeted by a variety of wildlife which will not be seen on this continent again. In addition to the animals of temperate America, they found an array of tropical species which had established in south Florida and along the Mexican border the northern outposts of their distribution. The latter were the first mainland species to give way to the white man's extension of his own range to the New World, and it may be that southern creatures now thought of as rare vagrants were once native, and that others have come and died away, entirely unrecorded.

Unhappily we know little of what the Spaniards saw, so intent were they on gold. Ponce de León, an adventurer of advancing years, was anxious as

well to locate a fountain of youth, and his impatience allowed him little time to reflect on the natural scene. The accounts of the conquistadors who came after him were likewise few and imprecise. During three centuries of Spanish reign, the world was none the wiser for the existence in Florida of numerous animals not remarked upon until after 1819, when the Spanish left. An almost immediate discovery was the American crocodile, attaining an impressive length of no less than twenty-three feet; since it formerly ranged far up the east coast of Florida, as well as on the southwest coast and in the Keys, one wonders how so noteworthy a beast could have gone for so long undetected.

Three possibilities seem likely, the most obvious being that the American crocodile was never prosperous in Florida. Also, it is an unsociable inhabitant of mangrove archipelagos and other salt wastes of limited attraction to the Spanish then and to Americans now. Finally, there is every likelihood that the animal was confused with its more common kin, the freshwater alligator, which is smaller, browner, and broader through the nose, and does not expose an evil-looking tooth, a habit of the crocodile even when its capacious mouth is closed. The alligator, though pursued for its hide and much reduced in numbers, is not in present danger of extinction. Current laws for its protection do not always deter small boys and other assailants (in one part of Florida, not long ago, the alligators were virtually extirpated by an outraged citizenry when the badly chewed body of one small boy was discovered in the local swamp; as it happened, the child was naked, and it apparently occurred to no one to inquire by what unholy devices these man-eaters first removed his clothes). Nonetheless it has

ALLIGATOR CROCODILE



reproduced itself sparingly from Texas to the Carolinas. The crocodile, which is thought to have come to Florida by way of the Gulf of Mexico—an Asian relative is known to have completed an ocean journey of over five hundred miles, from Java or Sumatra to the Cocos Islands—has withdrawn to the keys and mudbanks of the wild Cape Sable area.

The verb "withdraw" is used advisedly here. We are apt to think of wild animals as retreating from civilization in the same way that they might flee before a forest fire or flood. Actually, such retreat is ordinarily impossible, since any suitable habitat they might withdraw to is filled to capacity already by the same species. In other words, when one speaks of a species "withdrawing" or "retreating," one really means that it has been exterminated in certain units of its range, or that the habitats of the species within these units have been destroyed. It is the limits of the range which have retreated, for the affected animals themselves are dead.

The reptiles and amphibians of the world began a general withdrawal from existence many millions of years ago. The amphibians—newts, salamanders, caecilians, frogs, and toads—no longer play a significant role in the animal kingdom, serving chiefly as incidental food for other creatures, including man. In their great days, certain forms attained a size of fifteen feet or more, and might be said to have ruled the earth. Similarly, the huge reptiles which dominated the land, sea, and even the air of the Cretaceous are all gone. Of their numerous orders only four survive today, and one of these may vanish in our time, since its sole living representative, the lizard-like tuatara of New Zealand, is said to be on the threshold of extinction. The remaining reptilian orders—the turtles and tortoises, the crocodilians, and the snakes and lizards—are widespread in temperate and tropical regions, but their species are for the most part small, and a number of these, losing the use of limbs and sight as they seek shelter underground, become more and more degenerate as the centuries pass. Certain species are still prospering, but as a class the reptiles are slowly trailing the amphibians into obscurity.

In North America, only a few reptiles are large or impressive enough to attract man's attention. The poisonous snakes invite a certain deference, and the rattlesnake is even canned occasionally for human consumption. Small turtles and lizards are conscripted commonly as pets—the baby red-eared turtle, the green anole or "chameleon," and the horned lizard or "horned toad" are perhaps the most in demand. The diamond-back terrapin

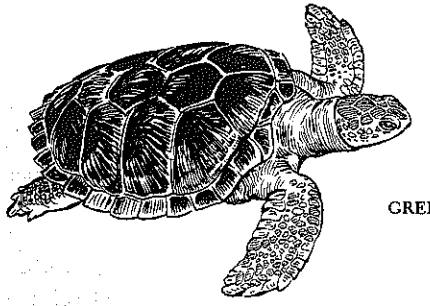
of Atlantic and Gulf Coast estuaries and salt marshes was at one time a popular delicacy, although the New York *Morning-Telegraph*, for May 7, 1912, was of the opinion that the terrapin "was never intended for vulgar palates." Nevertheless, the terrapin catch in the Chesapeake Bay area alone amounted to nearly 90,000 pounds in profitable years, and it was only a waning of interest in this expensive little animal which saved the species from extinction.

Since the alligator is generally protected, the last North American reptiles of economic significance are the sea turtles. The hawksbill turtle furnishes the "tortoise shell" of commerce, now largely replaced by plastics, but it is the green turtle, named for the hue of its edible fat, which has been referred to as the most valuable reptile in the world.

As early as 1620, "in regard that such waste and abuse hath been offered and yet is by sundrye lewd and impvident psons inhabitinge within these Islands who . . . snatch & catch up indifferentlye all kinds of Tortoyses both yonge and old . . . to the much decay of the breed of so excellent a fishe . . . ," the Bermuda Assembly passed "An Act Agaynst The Killinge Of Ouer Yonge Tortoyses," which protected any green turtle, as this fishe is now known, less than eighteen inches in breadth, within a fifteen-mile radius of the islands. Offenders were fined fifteen pounds of tobacco, half of which was put to public use and half presented to the informer.

These measures were finally in vain. The green turtle no longer breeds in Bermuda, nor anywhere in North America. So abundant in colonial times, from Massachusetts to Florida, that a man might catch one hundred off Cape Hatteras in a single day, it declined with the addition of the white man to its long list of predators. On the Florida coast, according to Audubon, both adults and egg nests were preyed upon by turtlers, bears, cougars, and bobcats, and, if the latter two enemies seem implausible, the fact remains that no nest has been found in Florida for over fifty years. Reaching a weight of five hundred pounds or more, the green turtle frequents the algae beds of shallow waters and buries its eggs in the sand of open beaches, two habits which, increasing its vulnerability, have helped to reduce it to its present low estate. A market is still operative at Key West for green turtles taken anywhere in the Caribbean, and a point may be reached where individuals become so scattered along the countless tropic coasts as to fail to form an effective breeding population. The last green turtle, one of the few large species to survive the Age of Reptiles, will

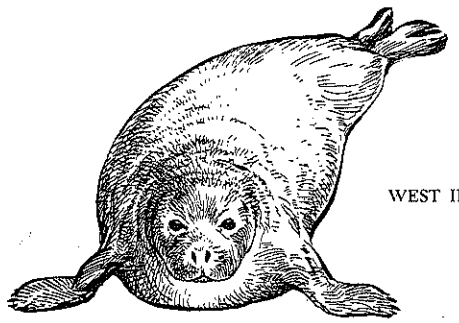
probably live its life out undetected. Seeking a mate, it may glide for many years over remote lagoon bottoms, its heavy shell crusting with marine creatures, until it comes to rest on some final sand, too ancient to stir ever again.



GREEN TURTLE

The land Ponce de León named Florida in 1513 contains today the last true wilderness in the nation. The Everglades, a trackless waste of swamp and hammock, sawgrass and palmetto, of orchids and strangler figs and poisonous manchineel, rolls south a hundred miles from Lake Okeechobee to the mangrove estuaries and shallow flats of Cape Sable, Florida Bay, and the inner Keys. The Cape Sable area is also vast and virtually uninhabited, and Okeechobee itself is twenty miles across. To the north of the lake lies a different wilderness, broad distances of long-grass prairie, the Kissimmee, some wild birds of which are not again encountered anywhere east of the coastal plains of Texas. Cypress swamps and limestone springs provide other distinct habitats, and far out in the Gulf the Dry Tortugas, named for the green turtles that once abounded there, support tropical sea birds seen nowhere else in North America.

A good deal of Florida's flora and fauna is peculiar to this four-hundred-mile peninsula, a fact not surprising when one considers that much of it is tropic, remote biologically from the temperate land mass to the north and remote geographically from other areas in the same latitudes. Its waters, fresh and salt, still swarm with fish, and its wildernesses, resistant to man, shelter a variety of life unmatched elsewhere on the continent. Florida can claim today almost all its original land mammals, including significant populations of the bobcat, river otter, black bear, and cougar, or mountain lion.



WEST INDIAN MONK SEAL

Though a number of its species are uncommon, comparatively few are presently in danger. Among wild creatures rarity is a relative condition, not always determined on the basis of actual numbers. Creatures uncommon in Florida are often abundant in the lands and islands to the south; similarly, what might be an endangered population for a widespread, gregarious, and economically significant species would be very healthy indeed for one by nature localized or solitary. In point of fact, the only endangered Florida creatures not found elsewhere in the tropics—the miniature key deer and the greenish Cape Sable sparrow—are probably no more than isolated races of the white-tailed deer and seaside sparrow, two very widespread forms.

The species which most concern us, therefore, are those which were once common on the southern boundaries but are now in various stages of disappearance, as well as those which, everywhere scarce, include this continent among their last retreats. They are not many, but as a group they are unusually interesting and picturesque, and their loss, in a few cases already consummated, will be a serious one to North American wildlife.

The obscure West Indian monk seal was once widespread in the Caribbean, but vanished first as early as 1835. A small herd discovered in the Triangle Islands, off Yucatán, a half-century later, was promptly set upon by zoo collectors and other enthusiasts, with the result that, over the years, at least four became residents of the New York Aquarium. A second result, compounded by West Indian natives who pursue the species for food and oil, was the virtual certainty of its eventual extinction: the last seal seen in Florida appeared at Key West in 1922, and though a few persist in the Yucatán islands, they are vulnerable to passing fishermen, and will probably disappear in the near future.

Ponce de León, who landed first north of St. Augustine, then rounded Florida to the west coast, and touched at the Dry Tortugas, very likely came upon this animal; coursing the coastal waterways, he must also have seen the manatee. A Spaniard named Hernández was subsequently impressed by the manatee's mental acumen, but actually the species could not even be called alert. A large, phlegmatic browser of submerged herbage, it is best known for its breasts, rude appendages which formed the apparent basis of the mermaid legends, since the manatee, cleft-faced, wrinkled, and bristled, qualifies in no other respect. Once common enough on the coasts of the Gulf States, the West Indies, and northern South America, with a few individuals summering as far north as Virginia, the hapless manatee continues to be shot, not only as incidental food by local people but by nautical tourists seeking target practice. Others are killed by recurrent cold waves, by boat propellers, and infrequently by crocodiles and sharks. A few persist in southern Florida, where, literally and figuratively, they appear to be treading water.

The Spanish may never have consumed this beast, for history shows that, even in emergencies, they were slow to take advantage of natural provender. Their early attempts to colonize southern coasts were marked by chronic famine, and the transient French colonists in Florida in 1564

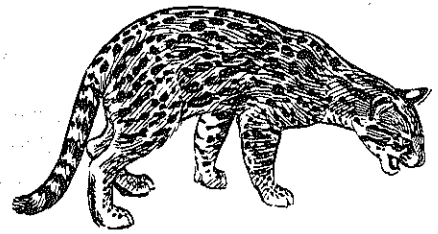
MANATEE

fared no better. Soldiers and gentlemen, the European adventurers disdained agriculture, and when their supplies were gone they made bread from old fish bones, and begged food of the same red men for whom they had shown contempt.

By this time, the "Christians," as the Indians knew them, were renowned for brutality in all the native villages of the Southeast. Unlike Columbus, who was touched by the simplicity of the aborigines and forbade unfair trade with them, these ungentle men had their hearts set on plunder. Ponce de León, the victim of an arrow, perished for his pains, as did Vázquez de Ayllón, five years later in Carolina, and Pánfilo de Narváez, who once appeased his frustrated zeal with the slaughter of two thousand peaceful savages. (Though the latter incident should assure Narváez's place in history, his fame stems chiefly from the fact that Cabeza de Vaca, whose fantastic wanderings on foot from the Gulf Coast through Texas and New Mexico became one of the great sagas of early America, was a survivor of the Narváez expedition.) Not surprisingly, the Indians were hostile when the redoubtable de Soto, between 1539 and 1542, struggled north and west from the swamps of Florida to the Carolinas, Arkansas, and Texas, leading a full complement of armored cavalry and foot soldiers and, more remarkable still, one thousand-odd balky swine.

The few contributions to American natural history made by these strong men were largely inadvertent. The American wild mustang and burro are Spanish fugitives, and de Soto's swine, which escaped in numbers, are said to be ancestors of the modern wild razorback hogs of southern swamplands; his expedition also discovered the Mississippi paddlefish, a primitive spade-snouted relative of the sturgeons found in large inland waters. Coronado, journeying north out of Mexico in the same period and wandering as far as Kansas in search of the elusive gold, returned with the first full reports of prairie dogs and bison. "During May," he remarked of the latter, "they shed the hair on the rear half of their body and look exactly like lions." [1]

More important, Coronado saw, somewhere in New Mexico, a predator which once prowled north to central California and east to Louisiana. The jaguar is the greatest cat of the Americas, resembling a very large, heavy-set leopard. Like the much smaller ocelot (and unlike the margay and jaguarundi cats, which, in company with the coati, some tropical bats, and smaller mammals, wander infrequently as far north as extreme south Texas and southeast Arizona), "el tigre" was formerly an established species north to the Red River in Arkansas, and a number of debatable early

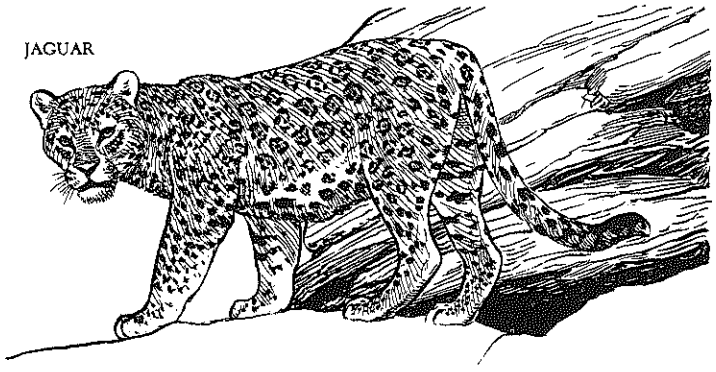


OCELOT

records place it as far east as the Appalachians. An account of the coastal Carolinas in 1711 notes that "Tygers . . . are more to the Westward. . . . I once saw one that was larger than a Panther [i.e. cougar], and seemed to be a very bold Creature. . . . It seems to differ from the Tyger of Asia and Africa." [2] Another writer subsequently stated that they were found in the mountains of North Carolina as late as 1737. Audubon's contemporary, Richard Harlan, claimed the jaguar was still seen east of the Mississippi in the beginning of the nineteenth century, though this seems quite unlikely. The short, explosive roar of this fierce creature was silenced early, at least partly as a consequence of bounties imposed by early Spanish authorities in the Southwest. It was last recorded in California in 1860, and in New Mexico about 1903, and although an occasional animal still prowls the Texas and Arizona border the jaguar must now be considered extirpated from North America. The ocelot, though it frequents three counties in south Texas, will probably follow close behind.

The most frequent southern visitors are, of course, the birds, and species new to North America are still recorded periodically. These include a scattering of West Indian wanderers as well as the parrots, trogons, chachalacas, and other jungle criers which cross the lower Rio Grande and the border of southeast Arizona. Such strong-winged birds as pigeons and hawks stray north in considerable variety, and some of these remain to nest. But most tropic species are transient, however numerous, and seldom become truly established; the brilliant scarlet ibis and the flamingo, for example, while considered quite common until a century ago, were never shown to have bred on our southern coasts, and probably were always more noticeable than abundant.

The species which remain established in North America over a significant range are usually members of three orders: the wading birds, the pigeons,

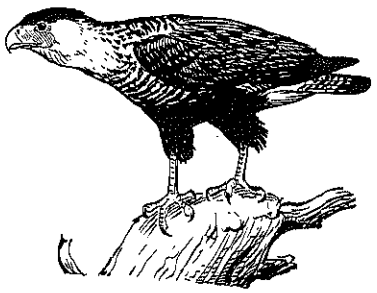


JAGUAR

and the hawks. Some waders—herons and egrets, ibises, and the roseate spoonbill—are here in numbers, and their bright, noisy rookeries are a striking facet of the southern coasts and swamps; though not all of them are common, their peril as a group came about through special circumstance (see Chapter 8), and is largely past. Most southern doves and pigeons are so local in their distribution here as to be of small importance; three exceptions of wider range—the band-tailed pigeon, and the ground and white-winged doves—are, like the waders, in no present danger of extirpation. The southern hawks, solitary symbols of the passing wilderness in the dead trees of defeated landscapes, are, on the other hand, vanishing one by one.

The birds of prey peculiar to the South include kites, buteos, a falcon, and a curious falcon relative of vulturish appetites, the caracara, which is found locally in south Texas and Arizona, and on the Kissimmee Prairie of central Florida.

Of these, the best known is the Everglade kite, which escaped attention even longer than the crocodile. Though it once bred commonly all through the southern Everglades, it has never occurred north of Tallahassee Bay, and its first nest was not located until 1896. The white man has since made vain attempts to domesticate the Everglades through drainage, a project which, in company with drought, has largely eradicated the only known food of this black, red-beaked, and sadly over-specialized hawk, the freshwater moon snail, *Pomacea caliginosus*. The Everglade kite, confined in recent years to remote corners of Okeechobee, is shot at consistently by restless duck hunters—as many as five have been found floating in front of a



CARACARA

single blind—and, as of this moment, is the rarest bird in North America. It is also increasingly scarce in Cuba, though a southern race occurs quite commonly from Veracruz and Campeche in Mexico south through the Americas. As a species, indeed, it may be in less danger than three other kites which also occur on this continent.

The kites are among the most graceful of hawks, and the swallow-tailed kite, which resembles a great black and white swallow, is perhaps the most striking of all North American birds. It once turned and slipped through the air of two continents, from Canada to the Argentine, and has been glimpsed as far east as New Hampshire, as far west as Colorado. One bird even engineered the difficult west-east crossing of the North Atlantic, and appeared in the British Isles. Sharing the tameness of all kites, however, it has remained innocent in the ways of man, and his firearms have reduced it to a pitiful remnant in the remote swamps of Florida, South Carolina, and Louisiana.

The white-tailed kite, in turn, has withdrawn westward, and, though once native to Florida and the Gulf States, is now rarely seen east of California, where by 1927 there were thought to be less than one hundred remaining. Its abundance appears to be controlled by the plenitude of field mice, to which these birds are addicted to the point of specialization, and its chief peril lies in the destruction of mice pasture by modern farm machinery and overgrazing. It is uncommon throughout its range, which extends to Guatemala, and may be the rarest of the kites. Sometimes it nests in orange groves, and the spectacle of this delicate gray-mantled bird, head and tail a vivid white against the bright green and orange of a sunny orchard, is not easily forgotten.

The Mississippi kite, blue-gray and black-tailed, has perhaps fared better, though it, too, has withdrawn southward from a range which once included

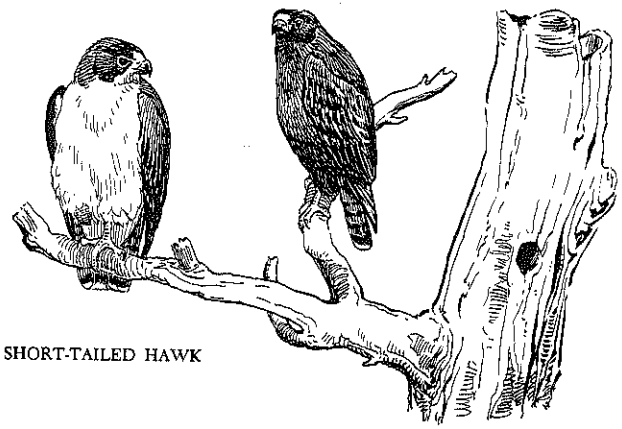
MISSISSIPPI KITE

WHITE-TAILED KITE

SWALLOW-TAILED KITE

EVERGLADE KITE (female)

EVERGLADE KITE (male)



SHORT-TAILED HAWK

the Central States; unlike its relatives, it is not native to the tropics, and it drifts south of the border only in winter.

The buteos or buzzard hawks include those familiar to most of us, the ones that circle to black pinpoints on blue seas of summer sky. They are also known, quite inaccurately, as "chicken hawks," and are severely persecuted for the depredations of foxes, raccoons, and the great horned owl. Nevertheless, though much reduced, the northern buteos have managed to maintain safe numbers: it is the southern visitors, never firmly established, that will be the first to go.

The small short-tailed hawk, which maintains an uneasy foothold in the Cape Sable jungles, is one that might be mentioned here since, unlike the tropical buteos frequenting the Mexican border country, it is rare throughout its Central and South American range. Among its relatives in the Southwest, three barely penetrate the United States, and a fourth, the handsome Harris's hawk, is still readily seen in the southern parts of all the border states. However, the white-tailed hawk, a pale soarer once widespread in the Great Plains country of south Texas, is dying out with the invasion of this grassland by mesquite and brush, which make its open-country hunting difficult.

The Great Plains, extending to the Texas coast, have traditionally been a mighty sea of grass. Over the years, however, the country has been fenced and broken, while its cattle ranching has grown ever more intensive. One result, by no means inevitable, has been overgrazing, which stamps out the food grasses, encourages flash floods and erosion, and, followed by drought,

WHITE-TAILED HAWK

can turn the land at last to sand and gravel. The bare land cannot carry prairie fires, which formerly served to kill back or eradicate the stubborn brush, and the thrifty mesquite and opuntia cactus invade quickly. Meanwhile, the draining of the small rivers for irrigation has lowered the water table in the region. The shallow ponds and oxbow swales dry out and crack, and valley woodlands of mulberry, huge live oak, and the raspy-leafed anacua—dense groves which sheltered jaguar and the small red wolf —shrink and wither away. Great areas of grass and woodland thus give way to mesquite desert, at an awesome economic loss to man. In the case of the white-tailed hawk and other forms of wildlife, this destruction of suitable habitat may prove fatal.

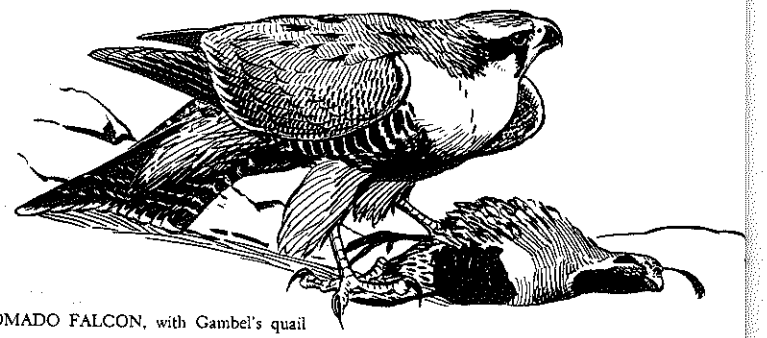
Though man is the usual catalyst, the causes of scarcity are rarely identical for any two species, and the hawks are no exception. All hawks, however, have been heavily reduced by that body of American gunners which regards the passing bird of prey as a fair target, and the danger is particularly grave when the species in question, like the beautiful, black-bellied Aplomado falcon, has never been a common bird. This swift, sharp-winged hawk flew north formerly to the deserts and dry canyons of the Southwest, and remained in certain areas to nest. Because of its rarity it also fell victim to oölogists, and especially to that avid breed of amateurs which, in its curious need to possess an uncommon egg, has too often presided at the extinction of a species. The Aplomado falcon is no longer a breeding bird of the United States, and is not often seen even in Mexico.

Though somewhat foreshortened, the Florida wilderness has so far survived man's best efforts to destroy it, if not to deface it, and to a lesser

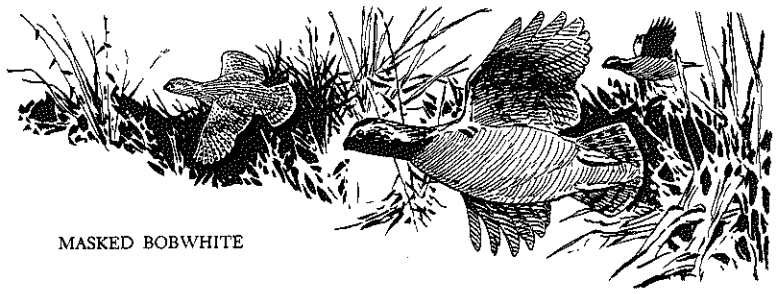
degree the same might be said of much of the swamp-tangled Gulf Coast. Increasing populations and industrialization in these regions, with accompanying development and drainage of marshes by omnivorous earth-moving equipment like the drag line, now present a serious threat to the coastal lowlands and their wildlife, the wading birds in particular, but it is in south Texas that the destruction of habitat has been most alarming. Not only are the grassland environments deteriorating, but the north bank of the lower Rio Grande, an area unique in the United States, is succumbing swiftly to development and drought. This small wedge of valley between the border and Rio Hondo, extending upriver a scant sixty-five miles, supports the last virgin red elm, hackberry, huisache, and ebony jungle in the nation, and an array of tropical birds and other creatures found nowhere else above the border.

The Rio Grande road, north and west, crosses a parched arroyo, Tigre Grande, named in memory of some historic jaguar. Beyond Laredo, the traveler encounters a mesquite-and-gravel badland which may well be the most oppressive landscape in the country, and it is only at the junction of the Rio Grande with the Pecos that a certain monumental quality offsets the desolation. The western mountains appear in the form of brown foothills, and the plateaus, high-flowered with yucca and prickly pear, take on a pale, fierce beauty. Seen across the desert washes from the north, the canyons and dark, cluttered peaks of the Big Bend are especially stirring. From here the Rio Grande, narrow and slow, curls north into New Mexico, and Old Mexico, a dust-misted world ever visible to the southward, suggests a limitless extension of brown barren.

The mountains of southeast Arizona rise from the desert floor like islands



APLOMADO FALCON, with Gambel's quail



MASKED BOBWHITE

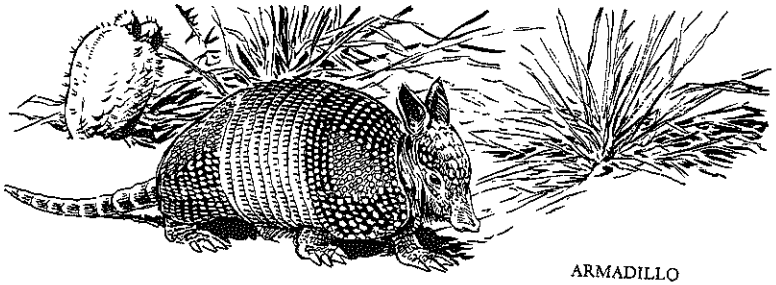
from the sea, and here one finds an odd oasis. High desert valleys, like deep river beds among the mountain masses, climb to sage foothills and painted canyons, chaparral slopes and sharp-shadowed, grassy ravines; higher still, cool deciduous woods turn to northern evergreen—ponderosa pine and Douglas fir and Engelmann spruce—and finally to snow peaks. The wide range of habitats to be found within a few thousand perpendicular feet shelter everything from cactus wrens to chickadees, including such rare visitors as the rose-throated becard, but here, too, overgrazing of the spare grassland has encouraged blight and a serious decline of the game birds of the border region. The first to suffer, predictably, were those more at home below the border.

The masked bobwhite, a speckled, rich-hued race of the common quail, was native in the nineteenth century to this part of the country, and was even abundant in the Altar Valley foothills. With the introduction of cattle, its narrow grassland habitat was devoured, and the last United States bird was reported killed in the Baboquivari Mountains in 1912. Within a few years it was also presumed extinct in Mexico, but in the late twenties it returned from the dead in a most dramatic fashion. An American tourist familiar with birds stopped for dinner at a Mexican inn, and ordered quail. Since the order was to take a little while, he walked around outside, and, happening into the back yard, discovered forty-odd masked bobwhite in a cage, including the bird intended for his dinner. He purchased the entire flock and carried them over the border, and these birds became the nucleus for the captive stock now found in the United States. Though a few wild birds are still thought to exist in remote areas of the state of Sonora, the survival of the breed may yet depend on the fact that an informed traveler ordered quail at a certain wayside *cantina*.

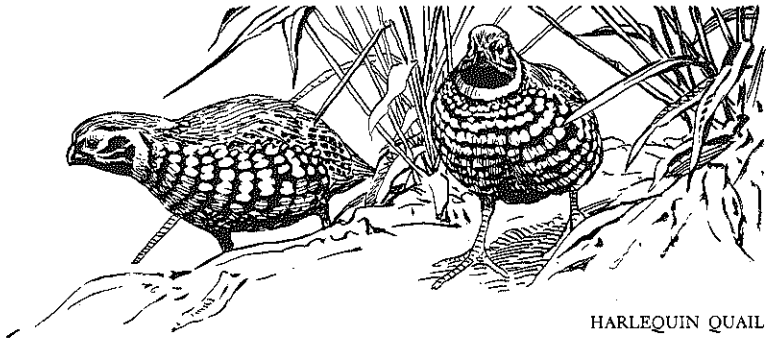
The bobwhite's relative, the harlequin-faced "fool quail," earned its common name as a consequence of its trusting nature, which has contributed importantly to its decline. The harlequin quail, in recent years, has become uncommon to very rare throughout its American range, from west Texas to southern Arizona, and though it has been called "one of Arizona's rarer vanishing birds," [3] it has not yet gotten its proper share of attention. The other desert quails and the Merriam's turkey, a western race once in serious peril, are of interest to sportsmen and therefore receive a good deal more encouragement.

The border westward from southeastern Arizona, across the Sonoran and Colorado Deserts to the green slopes of coastal California, traverses an arid, stony land on which man has had little effect. The region attracts few tropical vagrants, since that part of Sonora lying south of this stretch of boundary is largely the *Gran Desierto*, an awesome waste of black volcanic rock and blinding sand which spreads to the sterile salt shores of the Gulf of California; the north part of the Baja California peninsula, cut off by salt water and desert from the Mexican mainland, shelters a fauna related closely to that of adjoining areas in the United States.

As a group, then, the tropical species have withdrawn southward, but it should be noted that a few of them have reversed the process and continue to extend their northern range. The bizarre, armor-plated armadillo, an obscure border mammal only a quarter-century ago, has burrowed its way north to Oklahoma and Arkansas and east to Louisiana and west Florida, and in its near-sighted fashion gives every indication of intending to push onward. A much more extravagant example is that of the cattle egret, long an inhabitant of Africa and southern Asia, which apparently crossed the



ARMADILLO



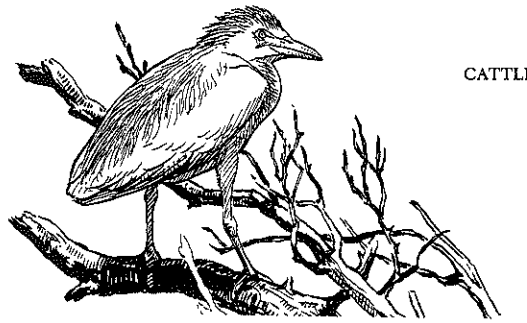
HARLEQUIN QUAIL

South Atlantic to South America some thirty years ago, and first appeared in Florida in 1948, the same year it traveled to Australia. In the past decade, far from behaving in the reticent manner of the usual exotic, it has established itself in several states and has visited widely on this continent. The first Canadian specimen alighted on a Grand Banks trawler in 1952, and three of these enterprising birds have since contrived, by some incredible hook or crook, to find Bermuda in the open ocean.

Ornithologists were startled by this explosion of egrets, for which no satisfactory explanation has been found, but they agree that the main reason for the bird's success, once it arrived, was the lack of native competition. Feeding chiefly on insects disturbed by browsing cattle, they fill an unoccupied "ecological niche"; no native species had yet learned to adjust its habits so precisely to the white man's livestock.

The concept of ecology—the relationships of living things to their environments—is important to an understanding of wildlife abundance. In nature, each creature has a niche or environment in which it finds the conditions necessary for survival and reproduction. The dimensions of this niche vary considerably with the range of conditions which the species in question can tolerate: certain salamanders, for example, cannot exist outside of subterranean caves, while the sperm whale finds matters to its liking throughout the oceans of the world.

In addition, a creature is more or less "adaptable" according to its ability to adjust to alterations in its environment. As a general rule, the younger genera still evolving, less specialized than more ancient forms, can adapt more readily and therefore tend to be more abundant throughout a wider



CATTLE EGRET

range. The range of a specialized creature may be extensive, but it is usually controlled by one or more precise factors. The Everglade kite, as we have seen, is restricted to certain types of marsh. Amphibians, which cannot tolerate salt water, never spread to oceanic islands, as reptiles, birds, and even small mammals, drifting on floating trees, have been known to do. Both amphibians and reptiles are paralyzed by cold, and are therefore confined to the temperate zones and tropics. Crows, bears, and man, on the other hand, not only are omnivorous but are able to adjust to wide limits of temperature and climate. Adaptable or not, however, no animal can survive the destruction of its environment. A poisoning of the earth's atmosphere, for example, would prove fatal even to that most adaptable of all creatures, man.

Man the predator, as a sudden and violent new factor in the animal ecologies of North America, was to overwhelm the great auk and other species. But his indirect effects, and primarily the mutilation of his surroundings which accompanied his settlement, would prove most harmful to wildlife at large. In the course of his invasion of the New World, the forests and rivers, plains and prairies suffered changes more drastic than those undergone in all the hundred centuries since the last glacier, and even creatures never preyed upon directly declined rapidly in his wake.

The course of man's march across the continent has generally been north and west. In the time of Coronado, the Spanish were already probing northward on the new ocean discovered by Balboa. Though they settled Santa Fe by 1610, they were not to colonize California for two centuries, despite the fact that one Juan Cabrillo may have sailed as far as Oregon as early as 1542. Nor were the English far behind him. In 1579 Sir Francis

Drake, the distinguished gentleman pirate, ventured north through the "vile, thick, and stinking fogs",[4] of this verdant coast, seeking the western exit of a Northwest Passage to India. Across the silent continent, the vastness of which had yet to be imagined, other Europeans sought an eastern entrance, touching at Baffin Land and Hudson Strait. Their countrymen, in the next decades, would settle the east coast, where the first explorers at Roanoke had "found such plenty, as well there as in all places else, both on the sand and on the green soil of the hills, as in the plains, as well as on every little shrub . . . that . . . in all the world the like abundance is not to be found. . . ."[5]