At restaurants, Asian shore crabs — an invasive species known to curb the populations of lobster and other shellfish — are sometimes served deep-fried. Kyoko Hamada

FOOD MATTERS

When Invasive Species Become the Meal

Is dining on nature's predators an act of environmentalism — or just a new way for humans to bend the world to our will?

By Ligaya Mishan Photographs by Kyoko Hamada

Oct. 2, 2020

ON THE PLATE, the red lionfish looks benign, denuded of its grand mohawk of venomous spines, cut down into neat fillets, floured and flopped in a hot pan with white wine and capers, then brought to the table leaking butter. Its flesh is as white as a snapper's, delicate and faintly sweet. To eat it seems more like decadence than righteousness. But the same fish is considered a menace in the Atlantic. Up to 20 inches long when fully grown and striated in cream and rust, it wobbles underwater with that dorsal mohawk and gauzy pectoral fins fanned out on either side, suggesting a feathered headdress set adrift, dreaming its way through life, until it backs its prey up against the reef and snaps. Its hunger is legend: The predator has been known to graze on more than 50 species, and its stomach can inflate to 30 times its natural size to accommodate its feasts, which sometimes equal 90 percent of its body weight.

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Appetite alone is not a crime, of course. What makes the red lionfish ruinous in the eyes of conservationists is not its efficiency as a hunter, nor its toxic, needlelike spines. Those characteristics are unremarkable in its home hunting grounds of the South Pacific and the Indian Ocean; there, the red lionfish was just a fish among fish, a known enemy that the smarter, smaller creatures avoided, and food itself for larger predators. Then, in 1985, one was spotted off the coast of Florida, the species' first recorded appearance in the western Atlantic. Scientists theorize that specimens imported to the United States as part of the aquarium trade were let loose in the ocean when they proved more troublesome than pretty, perhaps because they devoured all their tank mates. Equally at ease in the shallows or 1,000 feet below the surface, they appear to have adapted quickly to the change in scenery, thriving throughout the Gulf of Mexico and the Caribbean Sea, and traveling north to Rhode Island by 2001 and south to Brazil by 2014.

As a newcomer — what marine biologists have labeled an "invasive species," a term of mid-20th-century vintage — the red lionfish has a crucial advantage: In an evolutionary blind spot called prey naïveté, native crustaceans and fish don't recognize the frilly, candy-striped stranger as a killer-in-waiting. Larger predators like sharks and goliath groupers have been equally befuddled and tend to steer clear. Lionfish in turn don't seem to know when to stop eating to allow their food supply to replenish itself. Researchers have observed that the presence of a single red lionfish in a small patch of reef can lead, in just five weeks, to an 80-percent decrease in the number of native fish that survive from larvae to adulthood. The damage goes beyond the decimation of biodiversity to the habitat itself; lionfish victims include baby parrotfish, whose mature counterparts would otherwise feed on the algae that, unchecked, can smother coral reefs. Worse still, lionfish breed at a startling rate: Females are capable of producing eggs every three to four days, roughly two million a year.

How to defeat such multitudes? There are costly high-tech solutions in the works, including traps that lure lionfish using recordings of their own burbling sounds. Meanwhile, in a more analog effort, divers hunt the intruders for cash rewards at annual lionfish derbies in Florida and the Bahamas, some run by the nonprofit Reef Environmental Education Foundation (REEF), others by the Florida Fish and Wildlife Conservation Commission. One weekend event last year yielded a catch of over 14,000 lionfish, nearly 7,000 pounds of which were sold to a seafood distributor as food.

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For in the past decade, another front has opened up in the fight: restaurants and home kitchens, where we are slowly learning to defeat the enemy bite by bite. In Florida, the National Oceanic and Atmospheric Administration (NOAA) in partnership with REEF has enlisted chefs to make a case for lionfish as a delicacy: pan-seared, skewered on its own spines (provided that the spines have been baked first, to denature the venom) or diced into ceviche. To the south, in Colombia, where the government has declared the lionfish a "national security threat," an ad agency persuaded local priests to exhort their congregations to eat lionfish during Lent, as a good deed, to help restore equilibrium to the sea.

These campaigns are part of a broader movement to reduce, if not eradicate, invasive species — Burmese pythons up to 20 feet long swallowing bobcats whole in the Florida Everglades; sea lampreys sucking the blood out of fish in the Great Lakes; wild boars uprooting crops and wreaking havoc in city streets from Berlin to Hong Kong — by cooking them for dinner. Educational websites such as Eat the Invaders, founded in 2011 by Joe Roman, a conservation biologist at the University of Vermont, and slogans like "If you can't beat 'em, eat 'em" frame what might otherwise be merely an epicurean decision as a civic duty, a heroic act, even a declaration of war.

For around a century, Japanese beetles have destroyed grasses, leaves and other plant life throughout the United States. Kyoko Hamada

BEFORE THE 19th century, scientists rarely distinguished between indigenous and alien species. Even then, the language used for such a dichotomy was generally observational rather than judgmental. This shifted during World War II, when the British ecologist Charles Elton warned of "a violent struggle against the spread of undesirable plants and animals," taking a militaristic tone in keeping with the time, as if such intruders were the Nazis of the ecosystem. His 1958 treatise "The Ecology of Invasions by Animals and Plants" established invasion biology — the study of the detrimental impact of species introduced by humans to areas outside their native range — as a discipline, one that gained influence in the 1990s as globalization accelerated the transportation, witting or otherwise, of plants and animals across borders, ushering in a new era of radically diminished biodiversity: the Homogenocene, in which ecosystems lost their abundance and uniqueness, and everywhere began to look the same.

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Some of the worst offenders, in terms of killing off other forms of life, are plants: Kudzu, an Asian vine intentionally spread to combat erosion through the American South by the Civilian Conservation Corps during the Great Depression, strangles trees and blocks out the sunlight that lower-lying plants need to thrive; garlic mustard, from Europe, has roots that leach a toxic chemical, making the soil uninhabitable by its rivals. Japanese knotweed, which in its home country is held in check by local grasses and insects, elsewhere burrows deep and wide — one plant's rhizomes were reported to extend 32,000 square feet — and is almost unmatched in the botanical world in its sheer capacity for destruction, strong enough to break through asphalt, concrete and the floors and walls of houses. Knotweed must be dug out by the roots and smothered, for if you leave as much as a half-inch fragment behind, the battle is lost. In Britain, it's classified as controlled waste, to be disposed of only by licensed specialists, and those who fail to contain knotweed infestations on their property may be charged under the 2014 Anti-Social Behaviour, Crime and Policing Act. (Its hollow stems are tart and crunchy, akin to rhubarb and common in Japanese cuisine.)

To combat the specter of a monocultural future, universities and ecologically minded organizations from Oregon to Georgia now host annual invasive-species-themed cook-offs, fund-raisers and feral-hog roasts, where diners might sample salads laced with weeds and smash a piñata shaped like the iridescent Japanese beetle, which arrived on our shores a century ago in a shipment of iris bulbs and has chomped its way across the lawns of America ever since. At least one state, Maryland, has started putting the blue catfish, indigenous to the Mississippi River and Gulf of Mexico and now gobbling up blue crabs in the Chesapeake Bay, on menus at state institutions, including schools, hospitals and prisons.

The theory goes that the more people eat invasive species, the more incentive there is to hunt and harvest them — a classic free-market approach, except that the point is to boost demand until there is no supply. Should diners in fact grow fond of these novelties, the plan could backfire, recasting the species as a valued commodity. (In 1902, the French colonial government in Hanoi, Vietnam, hellbent on slaughtering the city's rats, offered a bounty for each rodent tail delivered as proof of execution; cunning entrepreneurs simply chopped off the tails and released the rats, leaving them free to breed and produce more rats, hence more tails and more bounties.)

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The challenge is to convince consumers that something labeled bad is also good: pernicious but delicious. Another rodent, the nutria, is a particularly tough sell. A 14-pound creature with long orange teeth, it lurks in swamps. It was brought to Louisiana from Argentina in the 1930s to be bred for its plush pelt, which once adorned the shoulders of Greta Garbo and Elizabeth Taylor. Since the late 1980s, when the fur industry started to shrink under pressure from animal-rights activists, the giant rats — long gone feral in the Louisiana wetlands — have multiplied, gnawing at plant roots in the marshes and leaving a wake of razed vegetation equal to 10 times the amount of each mouthful they take. Robert A. Thomas, a biologist and director of the Center for Environmental Communication at Loyola University New Orleans, was among the first to offer a culinary solution to the problem. In 1993, he recruited the chef Paul Prudhomme to transform the erstwhile pest into gumbo and étouffée for what would become, for a few years, an annual Nutriafest. (The Louisiana Department of Wildlife and Fisheries later joined the fight, posting online recipes for nutria chili and jambalaya.)

Black tiger shrimp, found in the waters off Texas, are half the length of a human arm and as plump and sweet as lobster. Kyoko Hamada

Prudhomme has described nutria meat as "a light lamb," while others liken it to rabbit or turkey thigh. Still, the animal's reputation as roadkill remains a barrier to its acceptance, however adorned with cayenne and allspice.

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WE EAT FOR survival first, then for pleasure. It's a luxury to be able to choose — and reject — food. (According to the World Health Organization, more than 820 million people went hungry in 2018.) Even once basic needs are met, we don't just descend into gluttony: Although biologically we are built to be omnivorous, there have always been those among us who accept limits on our diets, eating only what our ethical or religious dictates allow. Historically, the ability to control our appetites has been framed as virtue, from the fasting of saints to celebrity-endorsed veganism. The Greek philosopher Pythagoras is said to have refused meat (with occasional exceptions) because he believed in the transmigration of souls after death, among humans and animals alike; adherents of the ancient Indian religion of Jainism go further, following a principle of nonviolence that forbids not only harming but oppressing and enslaving other living beings, which includes the harvesting of honey from bees; vegetarians of today cite the environmental costs of raising livestock.

Often the emphasis is on what's absent from the plate, as if morality lay entirely in sacrifice. If you eat local, you give up strawberries in winter; if you confine yourself to raw food, it's the end of bread (unless you can engineer a dupe out of flaxseeds in a dehydrator). For invasivores — a coinage circa 2010 — the injunction is the opposite: to consume rather than abstain, granting what you eat an almost sacramental aura. It is no longer simply food. When you attack a lionfish on the plate, you are striking a blow for all the helpless native fishes who might otherwise go extinct. You don't eat it because it tastes good or because it's good for you in a nutritional sense. You eat it to *be* good. How convenient that in this case, duty aligns with pleasure.

The motive is honorable, although it's motivated by a capitalistic exchange. After all, it's easier to promote doing good deeds if no suffering or deep behavioral change is required, and chefs have worked hard to prove that these species are delightful, if not quite effortless to prepare. (Among other issues, federal regulations on trafficking wild-caught game across state lines can make it tricky to procure such ingredients in the first place.) One recipe posted to Eat the Invaders, for spaghetti with periwinkles — a type of whelk that has been turning New England's salt marshes into mud flats since the mid-19th century — notes that extracting the periwinkles from their shells is a laborious process, advising would-be cooks to "find an assistant if you can."

For both professionals and amateurs, invasive ingredients continue to multiply, with some becoming prized for their vivid flavor, like wild fennel from the Mediterranean that proliferates in abandoned lots, and black tiger shrimp in the waters off Texas, half the length of a human arm and as plump and sweet as lobster. At Miya's Sushi in New Haven, Conn., the chef Bun Lai deep-fries tiny Asian shore crabs, presenting them as a kind of clawed popcorn, and slices Burmese python gossamer-thin (the flesh is notoriously tough) before tossing it in a wok with sesame oil and ginger. The lyrical-sounding Silverfin is the Louisiana chef Philippe Parola's rebranding of the formidable silver carp, capable of growing four feet long and known to leap out of waterways and slap boaters on the head hard enough to cause a concussion. This troublemaker now quietly inhabits the frozen-food aisle, in the innocent form of breaded fish cakes, safely free of the carp's many annoying intramuscular bones.

A pie made with wild fennel, kudzu, Japanese beetles, tiger shrimp and Asian shore crabs. Kyoko Hamada

THE DAMAGE WROUGHT by certain nonnative species is real — not only in the radical transformation of habitats but in the risk of unfamiliar pathogens borne by introduced species, like the Ceratocystis fungus shed by wood-boring ambrosia beetles in Hawaii, identified in 2014 as the killer of hundreds of thousands of ohia trees, which make up 80 percent of the islands' forests, its branches home to honeycreepers (a critically endangered species), its spiky red lehua blossoms gathered for centuries to make lei. Some biologists fear that pathogens are increasingly making the leap from one species to another, especially in new environments where no immunity exists; three-quarters of the diseases that have emerged in the past decade, including the novel coronavirus, are zoonotic, passed to us from animals.

At the same time, the word "invasive" has metaphorical freight, encouraging, as the American biologist Matthew K. Chew has written, the "monstering" of flora and fauna, which can make killing them seem like the central mission, diverting attention from the more difficult and demanding task of redressing environmental harm. The language of battle summoned to the cause, however tongue-in-cheek ("be the predator," one credo goes), suggests an element of vengeance, as in ancient traditions when a warrior would eat the heart of a defeated opponent to claim dominance.

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The division of native and nonnative had a different resonance when Elton was writing in the 1950s, as colonialism was collapsing and Indigenous rights were finally being recognized. But today, there's an uncomfortable analogue to the derogatory language used to describe immigrants. Chew was among 19 ecologists to publish a 2011 paper in Nature titled "Don't Judge Species on Their Origins," pointing out that "most human and natural communities now consist both of long-term residents and of new arrivals." From the long view of evolution, it's not clear what it means to be native. The ancestors of modern camels, which we think of as indigenous to Asia and the Middle East, spent several geologic epochs — millions of years — in North America before going extinct there around 12,000 years ago, a comparative blip in natural history. The British lineage of Eurasian beavers came to an end in the 16th century, thanks to overzealous fur trappers, but when the government reintroduced the species to Scotland in 2009, some farmers protested that their dams blocked culverts and caused flooding, and a number of beavers were shot.

Even a disruptive species may become beloved. In the United States, the invader responsible for the deaths of up to four billion birds and 22 billion mammals each year is the domestic house cat. Recent DNA research has found a link between the pigs brought by Polynesian voyagers to Hawaii in the first millennium A.D. and the wild boars that ravage the island today; hunting them has become tradition, and no luau is complete without a pig roasting in the *imu* (underground oven). And kudzu, creeping up telephone poles and threatening to devour porches, is now emblematic of the South.

Some might say that given the scope of the environmental threat we face, there's no point in quibbling over such nuances. Arguably the great feat of the invasivore movement has been raising awareness of the crisis — although there's a step further that we have yet to take, to confront what the British ecologist Ken Thompson has called "the most dangerous species of all": humans. "To argue in the 21st century that any contraction, expansion or shift in the range of any species is independent of human agency is to make an assertion that, almost by definition, can rarely be literally true," Thompson has written. Our fingerprints are everywhere. We, too, have brought devastation to new lands, plundering natural resources, stealing from and killing those who lived there first, even spreading our own lethal diseases. We are the meddlers, the apex predators, the survivors at all costs who have taken over every corner of the planet, its seas and skies, its icy and desert wastes, and dared reshape it in our image. We are the invaders. Who will come for us?

Food styling by Young Gun Lee. Prop styling by Marci Leiseth.

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