



The Ruined Seascapes of the Wasteocene

On the Lives of Fishers and Gravid Fish in Coastal Ecuador

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Abstract Along the south-central coast of Ecuador, the shifting seascape and broader economic processes bind inhabitants with the unique sociomaterial qualities of fish and their commodified products, such as fishmeal. Based on ethnographic fieldwork, this article argues that the vitality contained within fish eggs is not located within the fish itself but rather within the relationship between fish bodies and the specific human knowledges that coproduce the subjective life of fish and its commodified forms. By examining the concealment of fish from industrial boats to fishers' households as a form of "marginal gain," this work connects hope and anxiety with fishers' notions of decline and indeterminacy. Fishers' reappropriation of fish forms a critique of fishmeal economies through shifting environmental histories of the sea that are sensed through nonhuman bodies and experienced simultaneously as beneficial and detrimental. Rather than viewing these human and nonhuman configurations as another example of human hubris in the Anthropocene, this article proposes that such relations are better understood within the Wasteocene, a logic that exposes the ways that human and nonhuman bodies are rendered physically and conceptually wasted through fishers and corporate instances of caring and killing.

Keywords multispecies studies, fishmeal, human-fish relationships, seascape, fisheries

Carlos stepped off the bus with a bright yellow bucket overflowing with fresh fish. The twenty-two days spent fishing each month as part of his work as a deckhand on the industrial boats of the fishmeal company had finally concluded. With a proud swagger and bucket in hand, he made his way to the palm thatch hut where the elderly conversed. Across the street from the gathering point, Carlos laid out different kinds of fish side-by-side on the sidewalk. The cue being the fish on the ground, the elderly folk rushed to grab the mackerel and sardines. Before returning to make himself comfortable at home, he first took some fish to his mother's household. Carlos took two plump black skipjacks wrapped in plastic bags out of his backpack: "There is no way I was sharing

these with the men on the highway. These fish are beautiful and also filled with life.” His mother Maria’s morning routine typically involves processing different kinds of fish: removing the guts, spine, and head, and draining the excess blood. On this occasion, she carefully removed the fish eggs and took them to the kitchen, where she would later use them in Carlos’s breakfast. Maria spread the fish guts in the chicken coop, where chickens quickly consumed the innards with much gusto. She also placed an additional portion of discards in a small plastic bin for the local pig breeder. Maria also burned the head, spine, and tail in the outdoor oven pit, later spreading the ashes around the plantain trees in her home garden.

Maria’s daughter-in-law usually burns the eggs with the rest of the guts instead of eating them. To feed her chickens, she uses a product known as *balanceado*, partly made of fishmeal and enriched with other supplements that made her “chickens grow faster, but taste different.” Maria’s husband Juan also reminded his daughter-in-law that the fishmeal company turns gravid fish into fishmeal and that purchasing feed supports continued fishmeal production. “The eggs have strength and vitality,” he added, emphasizing that nowadays, “people act like the factory, wasting away the good parts of the fish.” Fishers often criticized each other, comparing themselves and peers to the fishmeal factory, particularly during beach seining activities when they discarded fish such as catfish and other fish that have low commercial value but are locally appreciated. Juan also emphasized that fish are much savvier nowadays, less oily and skinnier, explaining how the stress and anxiety of witnessing their “family members” (other fish) die due to overfishing fundamentally changed fish.

During time spent on fishers’ boats, at dinner tables, in home gardens, and at the fishmeal factory, the terms *desperdicio* (waste) and *desperdiciado* (wasted) became common utterances. Two discourses of waste caught my attention because they referred to common but disparate realities embedded in fishmeal production. One reality signaled the waste from the factory in the form of sludge and pungent, nauseating odors expelled from the factory’s smokestacks. While fishmeal waste has a long history of interacting with people’s lungs and skin and instigating social protests in the region, overfishing and increased fishmeal production emerged as a greater cause for concern. This second reality tied to the capital accumulation of the fishmeal company pointed to the wasted lives of gravid fish sucked from industrial purse seine boats through pipelines, into the factory, and later pressed, churned, steamed, and dried. The way fishers experienced the loss of gravid fish as opposed to other fish helped me to situate their notions of the good life with the ever-increasing expansion of political economies of the sea and their internal contradictions, namely the critiques of fishmeal economies as predatory overfishing and the appreciation of these same economies as providers of fish, income, employment, and other material benefits.

In trying to understand both the trajectories of fish and fishers in expanding political economies of the sea, I have been drawn to Marco Armiero’s formulation of the Wasteocene, a concept and a logic that “unites humans and nonhumans in its production

of wasted lives and places.”¹ Thinking through the Wasteocene opens alternative curiosities about the lifeworld of fish and the ways that economies and ecologies become entangled with changing fishing practices. This article emphasizes the “wasting relationships” that render fish and fishers conceptually and physically wasted through the “destructive production” of industrial fishing and fishmeal production.² This work bridges the Wasteocene with the broader multispecies turn in humanities and social science research. Although Armiero notes the critical role nonhumans play in producing the Wasteocene, his concept remains tethered to an anthropocentric focus.³ In the case of fishers and the fish they seek to intersect, this all-too-human bent obscures the contrasting modes of relating to the seascape and the sociomaterial qualities of fish as they are increasingly caught in industrial purse seine nets. It is through the sociomaterial qualities of fish, both alive and dead, that it is possible to glean its wasted life, the indeterminacy of calculating its stocks amid an uncertain and volatile seascape, and its ontological status as a savvy and anxious subject and commodified object, or as non-human life that reshuffles the tenuous boundaries of legality and illegality. Thus I also place the Wasteocene in conversation with the concept of “economies of death” to highlight the necropower “governing life and death” on industrial boats and fishmeal factories and “how certain lives and bodies are made killable and disposable.”⁴ As Eben Kirksey and Stefan Helmreich state, the materiality of both the life and death of nonhumans give shape to the worlds we tend to label as strictly human.⁵ In this sense, fish bodies exert a gravitational pull or act as “affective catalysts”⁶ that attract fishers and company interests in sometimes competing ways.

While studies on human-fish relations have increased in response to the critique that anthropologists and human geographers are more inclined to study terrestrial warm-blooded animals than aquatic creatures, these works remain centered on small-scale fishing, Indigenous-state relations, and salmon aquaculture.⁷ One notable exception is Paula Satizabal and Wolfram Dressler’s work in the Colombian Pacific, which examines how institutional processes shape broader scale conservation and market forces that shift the meaning and value of fishers’ livelihoods, where fish are enacted as a resource, as a source of protein (or milk in local terms), and as an exotic item on restaurant menus.⁸ While the authors discuss the role of fish in forming particular assemblages, fish remain unchanged through the three different assemblages. This is a common symptom of

1. Armiero, *Wasteocene*, 29.

2. Armiero, *Wasteocene*, 2; Gordillo, “On the Destructive Production of Food.”

3. Armiero, *Wasteocene*, 3.

4. Gillespie and Lopez, “Introducing Economies of Death,” 1.

5. Kirksey and Helmreich, “Emergence of Multispecies Ethnography.”

6. Bennett, *Vibrant Matter*, xii.

7. Bear and Eden, “Thinking like a Fish?”; Duggan, Green, and Jarre, “Thinking like a Fish”; Todd, “Fish Pluralities”; Lien, *Becoming Salmon*.

8. Satizabal and Dressler, “Geographies of the Sea,” 1867.

maritime anthropology in general, where fish appear as a static economic resource, food, and symbol. In contrast I draw attention to the sites of flourishing multispecies anxiety where human-fish encounters revolve around the capture and death of gravid fish and the bittersweet contemplation of the economic benefits generated by the continued squandering of fish lives.

This article draws on one and a half years of ethnographic field research conducted in coastal Manabí Province, Ecuador, between 2014 and 2016, and six additional months between 2019 and 2020 in the communities of El Encuentro, which hosts the AZUL fishmeal company, and Esterito, ten kilometers away. I employed participant observation methods to learn how fishers generate ecological knowledge about the seascape and the role of livelihood diversification in the historical and socioecological transformations that have changed people's access to and control over fish. These activities included large-scale purse seine fishing, small-scale fishing practices such as foraging mollusks along the intertidal zone, and using fishnets and handlines. Further, I conducted semistructured interviews with fifty-five fishers from two communities who are either artisanal or industrial fishers or move between both sectors, as well as five marine biologists in Guayaquil and Manta, three company managers, and two technicians. The interview sessions focused on themes such as environmental change, El Niño, fishery regulations, fishing practices, fishmeal production, and human-fish relations. Historically, small-scale fishing was often one of several subsistence activities, including farming, foraging, and hunting. Today, industrial fishing is a full-time occupation for many fishers, especially those in communities closest to the fishmeal factory. However, small-scale fishing, foraging, and hunting are still vital for many fishers involved in industrial fishing operations. Indeed, out of fifty-five interviewees, forty-two identified as artisanal and industrial fishers.

In addition, walking became a crucial methodological approach, enabling observations of interactions that might have gone unnoticed and generating spontaneous encounters with fish and people. I traced paths and routes through the coastal landscape and seascape that locals found important in terms of history and environmental change. However, I also improvised my paths in the field, which led to a better sense of people's daily trajectories. In thinking about the tensions between gravid fish and fishers' livelihoods, I also followed fish on sea and land, often slowing down due to slippery boat decks and dangerous industrial fishing equipment. This forced slowing down at moments allowed me to take notice of deep-seated memories and fragmented histories that stirred hope and angst linked to seascapes subjected to socioecological changes of different magnitudes.⁹

The article first introduces a brief environmental history of fishmeal production in the area, drawing attention to how company personnel relate to fish and fish eggs. The article then weaves together stories from three different human-fish sensibilities:

9. Tsing, *Mushroom at the End of the World*.

(1) knowing fish as a savvy and anxious animal; (2) the wasted lives of gravid fish on board industrial boats; and (3) the marginal gains generated as fishers move between their households and industrial fishing boats, devising strategies to lessen wasting relationships. Together, these stories illustrate how fishmeal production, fisheries intensification, and shifting marine ecologies differentially implicate and affect fish and fishers.

Ruined Seascapes

Javiera Barandiaran and Casey Walsh argue that the historically contentious relationship between economic growth and the resulting adverse effects on the environment and local livelihoods are often referred to as “creative destruction,”¹⁰ a term that has influenced mainstream economic thinking and justified social and environmental injustices in the name of innovation, progress, and capital accumulation. Gaston Gordillo argues that the term makes the destruction associated with large-scale industrial projects an objective that is “acceptable and worth pursuing.”¹¹ Gordillo suggests replacing creative destruction with “destructive production” to rethink industries such as fishmeal production complicit in producing wasted ecologies through surplus capital accumulation and large-scale food production in Latin America and the Global North.¹² While replacing one term with another reveals social and environmental injustices, it also obscures the creativity in the destruction. Specifically, it may ignore the ways that fishing families have reinvested the economic benefits of stable employment to support their small-scale fishing livelihoods while also overlooking how the fishmeal company has deployed corporate social responsibility initiatives to gradually gain acceptance and receive praise for their social and economic contributions to the Ecuadorean economy. Additionally, it may also disregard the temporary care farmers show toward the animals that consume the feed in factory farms.

Surprisingly, fishmeal production has received little attention from anthropologists compared to the finalized marketable commodities of monoculture, aquaculture, and agri-food production. However, animal feed based on fishmeal was the critical ingredient that revolutionized poultry and swine production in the Global North after World War II.¹³ Following the use of fishmeal as agricultural fertilizer, scientists and industry leaders recognized the high levels of protein, nutrients, and minerals in fishmeal, which would promote faster growth in chickens and pigs. Feeding fishmeal to livestock allowed factories to restrict the movements of these animals as they did not need to forage anymore.¹⁴

10. Barandiaran and Walsh, “Production/Destruction in Latin America,” 718.

11. Gordillo, “On the Destructive Production of Food,” 798.

12. Gordillo, “On the Destructive Production of Food.” See also Longo and Clausen, “Tragedy of the Commodity.”

13. Wintersteen, *Fishmeal Revolution*, 2.

14. Wintersteen, “Smell of Money,” Haalboom, “Oceans and Landless Farms.”

The abundant anchoveta populations off the Peruvian coast due to the nutrient-rich upwelling process brought on by the Humboldt Current captured the attention of investors in the United States, Europe, and Peru.¹⁵ Once the Californian sardine fishery collapsed in the early 1940s, the epicenter of fishmeal production relocated south through a coalition of investors who acquired boats and technology from the extinct Californian fishery.¹⁶ The quiet seaside town of Chimbote transformed into an industrial site for fishmeal production, among other industries, and became known as the “Peruvian Pittsburgh” in the 1950s.¹⁷

With the eventual collapse of the Peruvian anchoveta after decades of overfishing, many operations relocated to Ecuador due to the confluence of both the Panama and Humboldt currents, which attracts a large population of pelagic fish species important for fishmeal production, such as sardines and mackerel. Southern Manabí, Ecuador, has historically been an economic backwater. While the Ecuadorean coast was not at the center of the Spanish conquest, their short-lived presence was enough to unleash significant changes in the area. By the beginning of the 1600s specific areas suffered a severe demographic collapse instigated by exposure to new diseases, acts of violence, and forced labor under onerous conditions.¹⁸ Over time, *montubios* (rural peasants whose identity is linked to farming more than fishing) and *cholo* fishers who fled from plantation labor inland, resettled along the coastal margins, fishing, farming, and taking sporadic advantage of the economic boom-and-bust cycles in timber, *tagua*, coffee, and cattle ranching.

During one of the first walkabouts through the factory’s main operations floor, the deafening noise of the machinery working nonstop overwhelmed my ability to hear clearly. The heat that emanated from the ovens and constantly spinning steel silos elevated the temperature significantly. Noting my discomfort, Manuel, the head manager, stated that none of those setbacks ever bothered him because the heat and sound of the machines smelled of money. In town, the smell of rotten fish mixed with a scent described as burnt engine oil generated similar comments such as “There is the money” or “The boats must have caught many fish last night.”

While walking between the silos I encountered auxiliary workers quickly taking buckets filled with discarded fish parts such as heads, guts, bones, and tails to the cooks. Several buckets contained fish eggs of different sizes still in the sac. One of the factory employees that accompanied us suddenly stated, “It is a shame that these eggs never became fish. So many lives lost.” Somewhat befuddled, Manuel responded, “Those eggs never contained life because they were never fertilized. The female first spawns at sea, then the males fertilize the eggs outside her body. Before that happens, there is no

15. Ueber and MacCall, “Rise and Fall of the California Sardine Empire.”

16. Wintersteen, “Protein from the Sea,” 9.

17. Wintersteen, “Smell of Money,” 38.

18. Newson, *Life and Death in Early Colonial Ecuador*, 254–55.

life, so it must be used. If not, it goes to waste.” He emphasized that the company paid a higher price for the eggs than the other waste because they contain additional nutrients and produce optimal fishmeal. Manuel also added that it was impossible to overfish pelagic fish nowadays because of improved scientific practices and technology. Indeed, the manager’s statements reflected how decades ago, investors viewed the abundant anchoveta off the Peruvian coast as wasted resources that offered a potential investment opportunity,¹⁹ an opening that cemented a relationship with nature premised on “extracting surplus from life.”²⁰

After pollution from the factory gained attention beyond the community, the company donated money to NGOs for conservation projects and became involved in public health campaigns and recycling initiatives, making invisible the black, gray, and brown sludge that gradually covered rocks, the seabed, and Isla Morada’s shores. Morada island is an ichthyological phenomenon that attracts migrating fish to certain sections around its craggy shores throughout the year. Archaeological evidence shows that Indigenous fishers routinely caught black skipjacks and other scombrids for thousands of years,²¹ and historical records from the defunct syndicate that once collectively governed the beach seine fishery from the 1920s to the 1950s show that the black skipjack was a highly prized fish.²² While fish such as snook, snapper, weakfish, and grouper live below its waters year-round, others such as bonito, frigate tuna, skipjack tuna, and black skipjack appear a handful of times, their presence lasting from four days to a couple of weeks.

In the discursive evocations of company managers and personnel, fish emerged as a global hope for resolving hunger and malnutrition. This mirrors the historical relationship and tension about the uses of anchoveta in Peru. Kristin Wintersteen mentions two competing visions for the use of pelagic fish in the 1950s and 1960s: using these fish to mitigate malnourishment within Peru, particularly among Andean groups with less access to fish, or using anchoveta to produce fishmeal for national and export markets.²³ Sixty years later, these visions converged on the grounds of the AZUL company as managers stressed that they formed part of a broader movement mitigating world hunger and even national issues of undernourishment by creating high-quality feed for animals consumed in Ecuador and abroad. They insisted that producing fishmeal to satisfy the international and national demand for feed for farm-raised shrimp and fish reflected a concern for both global and local communities, what Cymene Howe refers to as “anthropocenic ecoauthority,” where company personnel formulated “ethical claims on behalf of and in regards to the anthropogenically altered future of the biosphere,

19. Probyn, *Eating the Ocean*.

20. Asdal, Druglito, and Hinchcliffe, “Introduction,” 10.

21. Bearez, Gay, and Lunniss, “Sea Fishing at Salango.”

22. Southon, “Competition and Conflict.”

23. Wintersteen, “Protein from the Sea.”

human and nonhuman.”²⁴ For AZUL, fishmeal production has several potential trajectories in terms of local economic well-being, world hunger, and the national economy. The ambitious claims of the fishmeal company readjusted their extraction of fish and production of fishmeal to serve the noble cause of mitigating world hunger. This concern transcended what managers considered the mundane worries of small coastal communities, where calls for redefining bycatch laws to protect gravid fish clashed with the company’s ecoauthority over fish.

The Savvy yet Anxious Fish

For several evenings Arturo, his son Luis, and I had been fishing near Isla Morada without much success. Arturo and Luis’s strategy shifted from night to night, presenting the fish with dead and live bait. I noted Arturo’s inclination to ponder the abilities of his favorite target species, snook. One evening Arturo used a piece of a plastic bag he diligently shaped with his knife and scissors to resemble a medium-sized jellyfish. Surprisingly the plastic jellyfish attracted more fish than the other baits; perhaps, as Arturo explained, “they were curious, not accustomed to seeing such a strange bait. I have used this before, and I always catch plenty of fish, but I try not to use it too often because they will get accustomed; they become savvy.”

After an hour in which he landed seven snook, Arturo submerged a long bamboo stick in the water, except for the last few centimeters. He began listening intently to the activity underwater, describing the sounds as electricity and “popcorn.” Instead of turning on his small twenty-five-horsepower engine, he rowed slowly to where he suspected the fish congregated. Using a flashlight, Arturo scanned the water’s surface. Noticing the bright patchy lights that flickered near the surface when fish swam under the light, Arturo and Luis quickly began preparing three lines. Arturo suspected there was a school of black skipjacks, describing their dorsal markings as a mix of iridescent blue with black composed of three to five horizontal stripes. Suddenly he felt several tugs on each line. As he tried to control the lines with the help of Luis, he exclaimed that the fish seemed savvier than usual because instead of swimming to deeper waters where the line would become tense and secure the hook, they swam near the boat, loosening the tension of the line. Finally, after tiring the fish, the men hauled two large skipjacks into the boat, both fish flapping uncontrollably until tiring after a few minutes. As Luis grabbed a wooden stick, Arturo stopped him before he could hit one of the fish on the side of the head: “Why so hasty?” “You act like the factory, ready to kill anything without thinking!” He grabbed the fish using an old shirt and cradled the fish near his lower abdomen. As he applied pressure on its underbelly, some eggs and a shiny, dense liquid oozed out. “They are gravid, no wonder they were so savvy, they are desperate to live out their life. You know, they are savvier when they have life inside them.” To Luis’s disappointment, Arturo grabbed both fish and tossed them into the water.

24. Howe, “Anthropocenic Ecoauthority,” 383.

From a Deleuzian perspective, Christopher Bear and Sally Eden argue that recreational anglers attempt to become fish when seeking encounters with fish. Engaging with fish and their watery world requires relating to individuals and groups of fish as well as making sense of water color, movement, and other “rhythmicities” that allow them to engage with animals that are hard to detect.²⁵ Yet becoming fish only illustrates one possible relation without considering at least speculatively what fish may become and what fish gain from these encounters. Thus, conversations with fishers about fish revolved around the uncertain speculation that went beyond the physical qualities of water and fish to imaginaries about how they learn, develop meaning, and change in response to shifting circumstances such as overfishing. In this case, more so than becoming fish, fishers and fish attempted to become as savvy as each other. Both could become savvy and exhibit a *viveza*, which Broad and Orlove describe in the Peruvian context as a “specific sort of alertness that combines sharpness, wit, and a refusal to be tricked or fooled.”²⁶ This human-fish closeness contrasts with taxonomic assumptions that fish are distant from humans because they are cold-blooded, live in aquatic environments, and lack language.²⁷

Savviness is not a given property of either fish or humans but instead is a result of the different ways in which artisanal and industrial fishing practices have come together and coproduced human-fish savviness. For instance, the lives of fish move within an environment influenced by currents, wind, swells, and water temperatures, as well as confront human and nonhuman predators, pollution, and a changing climate. Similarly, fishers grapple with opportunities and circumstances that often arrive sporadically, like waves or currents. They must grapple with economic hardship, political uncertainty, and insecurity at sea. Constant movement characterizes fishers’ lives, shifting in and out of different situations while linking the flow of knowledge concerning fishing activities in different locations along the coast. Thus, becoming savvy for fishers and fish involves short-term strategies and long-term resilience, maintaining a creative openness to particular situations that emerge from a socioecological milieu rife with uncertainty and perpetual movement at different velocities, one where it has increasingly become more challenging to secure fish and where, for fish, it has become increasingly harder to survive.

For most of their lives, Saul and Arturo have been artisanal fishers and have had short stints fishing aboard the larger purse seiners when they first appeared on the seascape in the early 1970s. During their short experience aboard the larger boats, Saul and Arturo noted that when the crew caught black skipjacks and other scombrids in the larger nets, they would die quicker, inferring that the sheer number of fish caught and the quickness of the mechanized systems to pull up the net caused the fish much stress

25. Bear and Eden, “Thinking like a Fish?,” 344.

26. Broad and Orlove, “Channeling Globality,” 290–91.

27. Palsson, “Idea of Fish,” 114.

and anxiety. The high levels of intelligence displayed by fish and their ability to learn has led to European legislative measures adopted to reduce the stress that salmon experience as they are fattened and killed for human consumption.²⁸ The Ecuadorean fishers' experience offers clues about the stressful lives of fish out at sea beyond the realm of domestication. While the many fish I observed alive and followed once dead are not enclosed in pens as salmon are, they have become increasingly encircled in nets. Thus, not only does a savvy fish emerge from fishers' practices and relational engagements with seascapes, but also anxious and stressed fish.

Fish are not only "nonhuman knowns" but are also active in producing knowledge about the watery worlds they inhabit.²⁹ Fish can share affective states with humans such as stress, anxiety, excitement, and joy. Despret asserts that Jakob von Uexküll's use of the *Umwelt* concept to "rebuild the world as the animal perceives it" did not mean that he tried to assume the "affected perspective" of animals, a move that requires a relationship of closeness and intimacy.³⁰ The intimate relationship between fish and coastal dwellers begins at an early age. Parents teach their children the word *espina* (fishbone) to prevent them from choking, even before teaching them the words *mother* and *father*. Throughout their early years, children will eat fish two to three times daily, prepared in various ways. As they grow older they will wake up to the loud calls of merchants selling fish. They will also assist other fishers in disentangling fish from nets and processing them with their mothers in the kitchen and home gardens. When they become old enough, they will catch fish with handlines, fishnets, and harpoons or head off to fish with other men aboard fiberglass boats or larger purse seiners.

Thus, fishers not only needed to remain attentive to changes in the seascape that fish perceive to be important such as water color and temperature, the direction of the current, tidal shifts, or the presence of humans, but they also needed to assume an affected perspective that drew them into the social (and underwater) worlds of fish subjects. As Tim Ingold states, animal intelligence is not a capacity to react to external effects, but instead, the subjective worlds of animals are "one trail of growth and development in a heterogeneous field of interests and affects."³¹ In this case, the death of many gravid fish and the technological shifts associated with the continued expansion of industrial fishing dictated the fields of interest that affected the mood, savviness, and anxiety levels of fish.

Understanding what makes fish tick does not usually lead to care or concern about fish pain or suffering, yet there were instances where care spontaneously emerged from practices centered on returning gravid fish to sea to complete their lives. However, caring, as shown in other human-animal assemblages, is never too far from killing, as today's

28. Law and Lien, "Practices of Fishy Sentience."

29. Hinchcliffe, "Sensory Biopolitics."

30. Despret, "Responding Bodies," 55–57.

31. Ingold, "Anthropology beyond Humanity," 20.

eggs can very well be tomorrow's fish being hooked, encircled, or speared.³² Fleeting yet relational forms of caring for gravid fish temporarily sustain the link between fishers and fish, and as shown in Arturo's example, care "requires attention and fine-tuning to the temporal rhythms of an 'other' and to the specific relations that are being woven together."³³ Arturo's and other fishers' care and concern for fish can be thought of as a practice that "connotes both affective concern (caring about) and practical action (caring for)."³⁴ Fishers cared about the future of fish tied to the well-being of coastal communities and cared for gravid fish, releasing them in hopes that they spawn before falling prey to other predators.

Wasted Lives

The materiality of large catches aboard purse seiners, such as fish flapping in the net, the fishy smell in the air, and the sound of engines working overtime generated excitement among the crew and captains due to increased profits for both fishers and the company. However, a latent anxiety could be instantly sensed when the catch consisted of gravid fish. In the case of fishers on board industrial purse seiners, the entanglement of affective states encompassed a "weirdly-weird moment" that Timothy Morton describes as "the uncanny, unexpected fallout from the myth of progress."³⁵ The voluminous catches mean a larger paycheck for everyone, but the capture of gravid fish signals a more indeterminate future: "a serpent in a loop, swallowing its own tail."³⁶ When catches exceeded several tons, a large hose that transported fish to a conveyor belt on the boat sucked the fish directly from the water. A degree of grief was palpable over the loss of so many eggs, evident in how many fishers "felt sorry" for the death of "so much life that would be burned by the factory." While some fishers aspired to return the gravid fish to sea, the screams of their supervisors and captains and the little time available to secure the fish silenced their hopes.

The increasing gap between fishers and fish on industrial boats begins with the echoes and images that flash on the sonar monitor (fish finders) as it sends cone-shaped sound pulses toward the sea to locate objects. While sonars aid captains in detecting fish quicker than ever and revealing aspects of the seabed that are important for deciding when to cast the net, these advanced gadgets cannot show the captain which fish are gravid and which are not. Arturo's close interaction with the black skipjacks revealed details about the fish that sonars as aggressive "capture machines"³⁷ fail to detect, such as the bulge on the underside of their bodies and their savvy reaction due to their gravid condition. Arturo's relation with fish and the expansive intrusions into

32. Bocci, "Tangles of Care."

33. Puig de la Bellacasa, "Making Time for Soil," 705.

34. Buch, "Anthropology of Aging," 279.

35. Morton, *Dark Ecology*, 7.

36. Morton, *Dark Ecology*, 19.

37. Johnsen et al., "Cyborgization of the Fisheries," 23.

their world to become savvy while contemplating life underwater and inside fish bodies were temporarily cast aside by industrial equipment, tonnage, and profit margins.

After every fishing trip concluded, company technicians filled out a standardized company form. They recorded numbers and species names, which were then input into databases and later shared with fisheries institutions. Scientists at the National Fisheries Institute also calculated the available fish stock and collected data from other companies to analyze maximum sustainable yield statistically. This helps fisheries scientists understand fishing effort and make predictions about the long-term viability of the fishery. Fishers' confidence in the company, much like in the state, is limited, and they often expressed concerns and suspicions about the company's ability to provide credible models and forecasts about the future of small and large-scale fishing. Consistent with Peter R. Sinclair, Jahn Petter Johnsen, and Paul Ripley's analysis, power relations present in fisheries institutions and private companies tend to influence knowledge production more so than the apparent objectivity of scientific practices used to assess pelagic fish populations.³⁸ This was not as evident inside the factory's walls as "weirdly-weird moments" were absent when conversing with managers who spoke with certainty about the sustainability of the fishmeal industry. However, fishers critiqued the unwanted dumping of fish, fishing within protected areas or zones reserved for artisanal fishers, underreporting total catches, and the wanton killing of all kinds of fish.

Beyond the mistrust in the company's recordkeeping and modeling, what was also evident was that these scientific practices and managerial discourses enacted fish as stocks, as governable and stable objects, and as faceless beings devoid of individuality, isolated from the broader relations assembled with fishers and other fish along the seascape.³⁹ Fudge argues that an animal's inability to "look back" and to exhibit a degree of self-awareness inhibits a more sensitive politics and ethics of the nonhuman: "Lack of reason means lack of face, means lack of individuality, lack of home, which in turn means that these beings are outside full ethical consideration."⁴⁰ Much as fishers critiqued technocrats and state biologists for not knowing what a fish is, employees inside the factory (who are or were fishers) often reflected that it was easier for the company to recognize fish as a bag of fishmeal than as an actual animal. In contrast, divers often described coming face-to-face with fish, noting their curious facial expressions when the fish stared back at them. Other fishers detailed the face of the fish once dead, pointing to their eyes, teeth, and color patterns. Thus, for fishers, there are no fish in general or faceless populations of fish but a multiplicity of fish with unique ways of interacting with humans and communicating with fish and other nonhumans.

On some evenings while the crew rested, some fishers formulated calculations, writing down notes on half-torn pieces of paper. Marlon, for example, would calculate

38. Sinclair, Johnsen, and Ripley, "Power and the Production of Science."

39. Telesca, "Accounting for Loss in Fish Stocks."

40. Fudge, "Animal Face," 180–81.

how many eggs a fish could carry and how many potential fish they killed if there were x number of fish. Deckhands repeated this mathematical problem when they noted the clear liquid was oozing from fish bellies as the conveyor belt forcefully squished the fish against one another. Both fishers and company management transformed fish into numbers, but the numbers used to set up the math problem differed. While fishers calculated the approximate amount of fish wasted inside the bodies of female fish, record-keepers on board calculated approximate tonnage and profit, a loss of life versus a gain in profit. Fishers' claims that there is something wrong with killing gravid fish are incongruent with the biological realities and economic logics the company and its personnel assembled. Since gravid fish cannot be released once caught and cannot be detected using sonar technology or do not fit institutional definitions of bycatch, they are "designated expendable,"⁴¹ left to die with the rest of the fish caught.

Navigating Marginal Gains

Due to declining fish populations in coastal waters and the increasing number of boats, fishers felt the only way to secure fish was on board the industrial boats. During interviews, industrial fishing revolved around themes associated with pollution, overfishing, corruption, and predatory capitalism. Yet, in practice, fishing households brought industrial fishing into the rhythms of everyday life, becoming intertwined with other livelihood strategies with a longer trajectory, such as hunting, farming, foraging, and animal rearing. Many fishers now consider the once contested fishmeal factory to be an integral component of daily life. One of these opportunities includes the "mountains of fish," as Antonio described, dying on the private boats that they labor on and that momentarily lie in a transition zone between the public sea and the private factory, allowing for opportunities to redirect their trajectory to households and local markets.

In general fish are viewed as common property accessible to whoever catches the fish first. Fish become privatized once they are secured onboard industrial boats, as company policy prohibits fishers from taking or unloading fish to other boats. However on certain evenings, fish would be referred to as *chancha* (female pig), a portion of the catch that fishers covertly funneled out of the boats using collaborative strategies between deckhands, captains, and law enforcement. When catches consisted of gravid fish, deck supervisors often guarded the fish to deter fishers from funneling fish out of the boat. Company managers and technicians considered gravid fish to be of high quality, and the fatter fish increased the catch weight to fulfill monthly quotas the company established according to profit margins. Regardless of the warnings and the gaze of the supervisors, amid the darkness, high winds, and Pacific swells, fishers found ways to take gravid fish, often leaving behind nongravid fish. Here, I return to Carlos, who, at the beginning of the article, shared nongravid fish with townsfolk while secretly keeping the gravid fish as a prized marginal gain to share in the intimacy of household ecologies.

41. Nixon, *Slow Violence*, 151.

Jane I. Guyer highlights how people in West Africa generate “marginal gains” by creatively navigating economic opportunities that emerge from the “disjunctures between scales”⁴² embedded in both capitalist and noncapitalist economic practices and forms of value. Marginal in the coastal Ecuadorean context does not mean that these clandestine acts are insignificant; instead, marginal refers to the minimal, virtually unnoticeable practices that take place in the shadows of fishmeal production, allowing fish and fishers to seep through the cracks of industrial fishing infrastructure. Like the savvy fish seeking opportunities to escape from nets, the savvy fishers sought weak points in the fishmeal company’s enforcement practices.

While Guyer mainly focuses on economic benefits, I found that the gains from these clandestine practices exceeded economic considerations. Marginal gains reverberated around town, injecting liveliness into streets and households as fishers shared and circulated fish between friends and kin. Marginal gains are socially accepted, even desirable, but condemned by company personnel as the illegal behavior of “fishers that never learn and enjoy stealing.” However, sharing fish intersects with local moral economies that have a long history in the area, such as in times of crisis during intense El Niño events or economic downturns associated with boom-and-bust cycles, but also for the pleasure of doing so. Thus, marginal gains contrasted different forms of value at the household scale with more capitalistic forms of extracting value from fish bodies.

The prolonged absence and short-term presence of fish produced a seesawing of affects that led to questions about the extinction of fish and the livelihoods they help weave. When Carlos caught five mullets along the intertidal zone, three of which were gravid, he returned the three fish. He mentioned the ongoing crisis and lack of fish in coastal waters: “What will our children eat? Will they ever see the abundance of fish we used to enjoy? What if fish disappear?” Fishers’ acts of fleeting care for gravid fish were not recent shifts emerging amid increased fishing efforts but instead considered dying practices. The reduced frequency of fishers returning fish to the sea resulted from increased profits and markets that had driven fishers to “kill every last fish,” as Pedro stated when he carefully released two gravid fish from the beach seine. What is a recent shift, however, is the concern about the inevitable extinction of coastal lifeways linked to the lives and movements of diverse fish.

In the acute absence of fish in coastal waters, the ability to coordinate allegiances with captains, deckhands, and enforcement to funnel fish out of company boats maintains a world that fishers feel is disappearing. Instead of irrational and illegal acts, returning gravid fish to sea and clandestinely taking them from company boats are practices of “maintenance and repair”⁴³ that create “livable and lively worlds”⁴⁴ within an otherwise bleak outlook of the future.

42. Guyer, *Marginal Gains*, 95.

43. Krøijer and Rubow, “Introduction,” 379.

44. Puig de la Bellacasa, “Making Time for Soil,” 705.

What Future for Fish and Fishers?

In the opening pages of *Wasteocene*, Armiero argues that to produce alternatives to the wasting relationships that characterize the expansion of capitalist-intensive industries, nothing less than a “multispecies liberation alliance”⁴⁵ is necessary. This article has sought to show how the wasting relationships in fishmeal production generate more than just the residue of processed fish, the toxic and pungent scents expelled from factory smokestacks, or the sludge discharged underwater. There are also notable changes in human and nonhuman lives, such as the technological innovations, recordkeeping, and scientific practices that objectify and commodify fish, the behavioral changes and affective shifts that fish have undergone, the dying practices of returning fish to sea, and the covert strategies that fishers devise to redirect fish from industrial boats to their households. Additionally, the analytical specificity the Wasteocene provides beyond waste as garbage or as a dumping site makes a valuable contribution (and alternative) to the broader narratives the Anthropocene puts forward.

Considering the entanglement between households, small-scale fishing, and industrial orderings, what does this show about caring for gravid fish when confronted with the inevitable need to catch them for the company? Unexpectedly for fishers, the stability provided by abundant fish in the not-so-recent past and the moral economies tied to coastal livelihoods increasingly rely on the marginal gains generated on industrial boats from fishers who maintain a mobile life between ecological and industrial zones. In an adverse Wasteocene marked by increased uncertainty, Carlos and others find value in their industrial fishing lifestyles despite their implication in simultaneously killing and caring for gravid fish. They prefer this lifestyle to other alternatives distant from fishing because it allows them to merge seemingly contradictory moral norms associated with an artisanal fishing identity and the labor demands of industrial fishmeal production, thereby generating a sense of stability through varied forms of relatedness with fish that, in the increasingly commodified fishing economy of coastal Ecuador, can no longer be sustained by small-scale fishing livelihoods.

Walking along the beach with fishers raised “ghostly presences”⁴⁶ of intertidal zones once teeming with life and movement. The looming fear of a life without fish can be as anxiety-inducing as extinction itself, what Samuels refers to as “haunting uncertainties”⁴⁷ that exert much affective power in an already volatile climate where a sense of control has become unfastened in small-scale fishing spheres tied to the challenges of securing fish in coastal waters. Taking and sharing fish momentarily conceals the anxiety accompanying rapid socioecological change. These hopeful possibilities for repair are akin to “commoning practices” that simultaneously “produce wellbeing through care and inclusion”⁴⁸ and challenge the othering of human and nonhuman

45. Armiero, *Wasteocene*, 3.

46. Mathews, “Ghostly Forms and Forest Histories,” 146.

47. Samuels, “Narratives of Uncertainty,” 229.

48. Armiero, *Wasteocene*, 3.

bodies, revealing how sharing affective states with fish and sharing and eating fish and their eggs with fellow humans might come to matter in wasted conditions.

Sharing fish may not obliterate the Wasteocene or fishmeal production, but taking, circulating, and sharing fish will continue to provide yearnings and coherence amid incoherent futures, as it has previously done. There is always a possibility that fishmeal production will come and go similarly to the other boom-and-bust cycles that have left their mark on the coastal history of fishing communities in Ecuador. However, one question remains unanswered for fishers: When or if fishmeal busts, will fish still be around? The answer depends on how savvy fish can become to outwit the fishmeal company's rapacious tendencies, as well as transformations in the human realm. Changes in by-catch laws, as one example, require subverting existing "toxic narratives"⁴⁹ of economic growth and colonization of marine environments while developing new modes of more-than-human relating. Modeling in terms of catch rates and profit margins silences particular definitions of nonhuman life that could lead to better bycatch laws that benefit gravid fish. What if fishery scientists assume an affected perspective and produced models using the calculations that fishers formulated when gravid fish flapped hopelessly in the net? That is, the models would reflect not only how much profit the company generates, but also how much life is wasted. These are more sensitive models that consider the changing histories of fish and fishers in the fraught contemporary juncture that is the Wasteocene.

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49. Armiero, *Wasteocene*, 21.

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