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Caterina Scaramelli

"THE WETLAND IS DISAPPEARING": CONSERVATION AND CARE ON TURKEY'S KIZILIRMAK DELTA

Abstract
This article analyzes the transformation of the Kızılırmak Delta on the Black Sea coast of Turkey into a Turkish wetland. This production involved the transformation of international categories of wetlands into national imaginaries, as well as the material remaking of landscapes themselves. Population and agro-economic shifts concurrent to the formation of the Turkish nation-state transformed the delta into an agricultural landscape, and subsequently into a contested conservation area whose use is informed by changing Turkish and international notions of wetlands. I focus on the situated, local processes and practices through which wetlands are produced and become relevant to different social groups as subjects of scientific knowledge and environmental imaginations. These, I argue, have rendered the wetland an open-air laboratory and an object of care for environmental advocates, scientists, and residents.

Keywords: anthropology; care; conservation; environment; Turkey; water

One September afternoon in 2014, Ali Kemal Ayan, a professor of agricultural engineering, convenes a group of college students in the Kızılırmak Delta wetland conservation area on Turkey's Black Sea coast. Climbing on the squeaky wooden steps of the visitor center's birdwatching tower, one can gaze across the delta's expanse of wet meadows and shallow lakes and lagoons, and see the reed beds, swamp forests, and sand dunes stretching out to the Black Sea coast. Herds of water buffaloes, sheep, and horses graze in the common pastures, guarded by lone shepherds riding their horses or motorcycles on the meadows. Beyond the boundaries of the conservation area, marked only by official signs positioned on the one main road, fields of rice and corn are almost ripe for harvesting. Beyond Lake Cernek, the largest wetland in the delta, hills and mountains are obscured by light grey clouds. Closer to the tower, canals and a water pump station suggest the presence of the extensive network of irrigation that wets the rice fields, and the drainage canals that, in the late 20th century, turned the coastal delta into productive agricultural land. Not visible from this tower, though central agents in the making and remaking of the delta's form and ecology, are the dams upstream on the Kızılırmak River and, downstream, the bustling town of Bafra.

Caterina Scaramelli is a Robert' 57 Keiter Postdoctoral Fellow in the Department of Anthropology and in the Centre for Humanistic Inquiry, Amherst College, Amherst, Mass.; e-mail: cscaramelli@amherst.edu

"Take your shoes off," Ali Kemal commands, gesturing towards the water ahead. Thirty young men and women and I start off barefoot towards the soft shores of Lake Cernek. Thorny plants prick our feet until the slippery mud grows deeper. One student falls into the mud but trudges forward gamely, her jeans now caked in grey. Water buffaloes turn apprehensively towards us: some lumber away from the pools of mud, water trickling off their furry bodies, while others seem indifferent to our presence. As we circle back towards the fenced lawn of the visitors' center, the students relax, chatting animatedly on firmer soil. "Now," Ali Kemal says with a smile, "you have all learned to be water buffaloes—to feel the wetland."

Later in the evening, sipping glasses of tea back in Bafra, I speak with Ali Kemal Ayan about the exercise. A well-liked local specialist in organic agriculture and wetland management, Ali Kemal has been leading a wetland education camp for university students. This undertaking, funded by Turkey's Scientific and Technological Research Council, is coordinated by local university professors, and I have joined the wetland school as a volunteer assistant. Ali Kemal, I have seen, is working to instill in his students similar questions to the ones that brought me to the Kızılırmak Delta two years prior: how are wetlands produced, discursively and materially, as *wetlands*?[1] Over the course of the long 20th century, the swamps and marshes of the lower Kızılırmak Delta have seen two major transformations. First, they emerged as a productive agricultural region, and then, they came to be seen as a contested wetland conservation area. Like Ali Kemal, I understand these two transformations as entangled. Unlike me, Ali Kemal has also tasked himself with *producing* the Kızılırmak Delta as a valuable wetland, through the exercise of scientific knowledge making: a process that takes place in scientific papers, political advocacy, or asking students to step into a lake.

Leaning back, Ali Kemal reflects on the importance of "feeling" the wetland landscape—of identifying sensorially with mud, buffaloes, water, plants and thorns. Yet, sensing, or feeling (*hissetmek*), is not enough. After students come to feel part of the delta, he explains, they begin to pay attention to the wider processes impacting it: from conservation policy, to pollution, climate, infrastructure, cultural practices, and farming practices. He describes this work as *fark ettirmek*, meaning to raise awareness, or to make someone notice, which he connects explicitly to physically being in place. Ali Kemal understands the delta as a valuable yet threatened ecology, and postulates that recent changes in infrastructure, water flows, pollution levels, and agricultural practices are leading to the loss of wetland habitats and the possibilities for ecological life. Ali Kemal, his colleagues, and his students are crafting relationships of care—political, scientific, cultural, material—that create and sustain ecologies for humans and nonhumans to inhabit. These care relations are driven by emotional and ethical commitments, overriding utilitarian concerns, and do not pre-exist these social, bodily, and sensorial knowledge practices.[2]

In the following sections, I analyze the production of the Kızılırmak Delta as a Turkish wetland. Population and agro-economic shifts concurrent to the formation of the Turkish nation-state in the 20th century turned the delta into a lived landscape of fields, pastures, and canals, and then into a contested conservation area, a transformation informed by changing Turkish and international notions of the wetland itself. Then, drawing upon twenty-two months of ethnographic fieldwork that I conducted between 2012 and 2017, ten of which were in the Kızılırmak Delta, I interrogate the ways in which

advocates of the Kızılırmak Delta care for degrading ecologies—and how, in so doing, they construe the delta as a scientific object.[3] The wetland has to be produced over and over as a wetland through particular knowledge practices.

Contestations over the meaning of conservation and the nature of the delta remain central to this transformation. Foregrounding the centrality of water and infrastructure not only to the formation of delta landscapes but also to contemporary contestations over their fundamental nature, I highlight the uneven quality of knowledge exchange between scientists and farmers in the delta. These contestations center around a set of key questions. What kind of ecology should the delta-as-wetland be, and for whom? Who is excluded in such a configuration? Wetland advocates' own efforts to answer these questions evince not only the resonance of wetland conservation, research, and education, but also an emergent category of lived ecology. At a time when Turkey has become known for widespread social turmoil, political repression, and environmental degradation, work of wetland advocates in places such as the Kızılırmak Delta demonstrates the ongoing and widespread salience of ecology as a proxy for imaginations of livability.

In this analysis, I propose that we attend to the care practices of wetland advocates. Anthropologists of Turkey have already situated practices of care at the heart of notions of morality, kinship, belief, and modernity.[4] More broadly, the analytic of care in anthropology has been widely employed to theorize kinship relations, notions of morality, and power asymmetries.[5] Environmental conservationists would agree with political scientist Joan Tronto, who defines care expansively as "everything that we do to maintain, continue and repair 'our world' so that we can live in it as well as possible."[6] Imagination of livelihoods and speculation about possible futures (and value) are central to people who care for ecologies.[7] But care is both productive and destructive: while it creates and sustains some relationships, it simultaneously damages others.[8] This is no less axiomatic, I contend, in the Turkish context. In this article, I focus on care of the wetland to emphasize the daily practices, ethics, and relationships that inform the work of scientists such as Ali Kemal, foregrounding their sense of affective commitment that undergirds an "expert" concern for degrading environments.[9] These environments are more than scientists' "open-air" laboratories of ecological care. In bringing historical and ethnographic approaches in conversation, I propose that such care practices must be understood in the context of historical and current remakings of environments.

Less critical is the question of whether conservation in the Kızılırmak Delta fails or succeeds, because the answer to this is necessarily perspectival and relational. Scholarship on the shortcomings of environmental policy in contemporary Turkey has often provided structural answers to overdetermined concerns of environmental degradation and policy failure. In a polemical and much-discussed 2011 article in *Biological Conservation*, Turkish scientists called attention to the nation's purported "biodiversity crisis," identifying interconnected cultural, socioeconomic, and institutional reasons for the failure of environmental conservation.[10] Political scientists have argued that environmental policy in Turkey has been characterized by centralized state rule and developmentalist ideology, and that citizens have prioritized issues of economic disparity and identity politics over environmental concerns.[11] These analyses, however, remain couched within modernist narratives: Turkish environmentalism is cast as either a global import, or a reflex of dissent responding primarily to Turkey's failure to adopt modern

standards of governance, such as ecological protection.[12] Rather than proposing new metrics for defining the success or failure of conservation policy, it is essential to shift the focus from policy outcomes to the situated, local processes through which wetlands are produced and become relevant to different social groups as subjects of care practices.

In doing so, this work also reinstates the importance of regional specificity. Environmental conservation projects are entangled in the violence of colonial histories: nature conservation areas were established by colonial governments and postcolonial national elites, displacing subsistence populations and indigenous communities.[13] Conservation projects often materialize nationalist and colonial historical narratives, whether by reconstructing ancient wildlife species or unearthing archeological remains.[14] Scholars of contemporary Turkey have recently shown that concerns with environmental destruction and ecological loss are intimately tied to contestations over livelihood and democracy.[15] A renewed ethnographic interest in the contested ecologies of Turkey focuses on cultural narratives of environmental degradation, the micropolitics of irrigation infrastructure, resistance to neoliberal valuations of water and energy, the temporality of large-scale dam projects, activist mobilizations against nuclear energy, and responses to neoliberal development paradigms and authoritarian governance.[16]

Anthropological analyses of environmental relations, ethics, conflict, and change are transformed through an engagement with environmental history, together with Science and Technology Studies (STS) of the Middle East.[17] In bridging these fields, I interpret scientific categories, such as the wetland, as historically produced and contested objects, and tie them to longer environmental histories. Rather than implicitly asserting an abrupt shift from wetland reclamation (the production of new land through drainage) to conservation, attention to the making and remaking of the delta's environments in the 20th and 21st centuries demonstrates institutional, material, and ideological continuities between them.

MAKING TURKISH ECOLOGY IN THE KIZILIRMAK DELTA

Wetlands were formed as scientific categories to describe what scientists saw in the mid-20th century as rapidly degrading water ecologies. Turkish scientists and planners put these categories to work as descriptors of both ecological value and degradation. Scholarly accounts of the rise of wetlands as global objects of environmentalism have often focused on institutional histories and debates around conflicting scientific and legal categories of the wetland.[18] These have too often disregarded regional contexts. Turkey's participation in international wetland conservation science since the 1960s must be positioned within national (and nationalist) political and agricultural histories. To understand wetland conservation in the 20th and 21st centuries, I turn to earlier imperial and national histories of landscape and demographic remakings tied to projects of wetland drainage, showing how the delta exemplifies the broader national transformation of wetlands into sites of forced migration and resettlement.

Pontic geographer Strabo (63 BCE–23 CE) described Gazelonitis, the delta of the river Halys (today's Kızılırmak), near his natal city of present-day Amasya, as a "fertile country, wholly consisting of plains, that produces every kind of fruit. It also affords pasture for flocks of sheep, which are covered with skins, and produce a soft wool."[19] At the turn of the 19th century, the delta was still a coastal landscape of swamps,

meadows, and shallow lakes. People grazed sheep and water buffaloes, hunted, fished, and gathered reeds for thatching and weaving. Yet littoral transformations have meant that this coastal region is no longer the land described in Strabo's *Geography*: geographers estimate that since the turn of the Common Era, the delta has expanded towards the sea at a rate of ten meters each year.[20]

The lower coastal lands were occupied seasonally, for hunting, grazing, fishing, and wood and reed harvesting. Circassians escaping from persecution in the Russian Empire in 1864 were offered the marshes of the Kızılırmak Delta instead of the higher mountainous lands they had desired; almost all perished from malaria during the first summer. On the higher land surrounding the lower delta, people grew hazelnuts and a New World crop: tobacco. First encountering the crop in the 16th century, the Ottoman Empire became the foremost exporter to Europe by the 18th century. The growth of tobacco transformed markets and populations: after the formation of the Public Debt Administration in 1881, tobacco production in the Kızılırmak Delta came under the purview of the French Tobacco Company, the Regie.[21] Pontic Greeks and Armenians controlled production and trade. After 1923, tobacco became a state monopoly, and newly resettled Muslim Greeks took over the work of tobacco growing, together with Roma communities. Through crops such as tobacco, the delta grew more closely embedded in global cash crop markets.[22]

Environmental advocates often talk about the delta's population as ancient and traditionally connected to the land. However, the delta was thoroughly resettled in the 20th century, meaning there is little demographic continuity. During the Committee of Union and Progress government preceding the 1923 founding of the Turkish Republic, thousands of Armenian and Greek Orthodox men and women were killed and deported. Their deaths were due not to the effects of then widespread malaria, but to Ottoman-Turkish nationalist uprising and war. Beginning in 1915, Ottoman authorities conscripted Armenian men in labor battalions, subsequently deporting Armenian populations from Anatolia to concentration camps in the Syrian desert via harrowing death marches. Similarly, starting in 1914 and culminating in 1919–21, Ottoman communities of Orthodox Greeks were forcibly conscripted, deported, and attacked. In Bafra, Sinop, Samsun, and surrounding areas, a series of armed operations in the winter of 1916, and an intensification of executions and deportations in 1919–21, resulted in the violent suppression of Pontic Greek and Armenian civilians.[23] Local memories of the communities of Pontic Greeks and Armenians, and their material traces in the land—houses, fields, churches, schools, fountains, cemeteries—have been elided.[24]

Even before the Turkish war of independence, the Kızılırmak Delta's marshes had been used to accommodate incoming populations, particularly after the war of 1877–78 and the Balkan Wars of 1912–13. In the wake of the Conference of Lausanne in 1923, the remaining Orthodox Greek residents of Anatolia were forced to leave, and Muslims from Greece were resettled in their place, resulting in about two million people resettled on both sides, with about 300,000 non-Muslim minorities remaining in Turkey—constituting 2 percent of the population. By 1926, the delta had 56,000 residents, 6,000 of them Muslim Greeks resettled since 1923. From the 1940s onwards, more populations were resettled, especially from Albania and Bulgaria. The resettlement of Muslim populations from former Ottoman provinces to the delta prompted the first large-scale efforts of wetland drainage.[25]

Imperatives of wetland drainage and reclamation grew closely sutured to projects of Turkish nation formation in the 20th century. For instance, wetland drainage intertwined visions of national development with concerns over public health and political stability. Like their European and North American counterparts, Turkish officials viewed water-saturated places (*batak*) as areas to be drained and transformed into agricultural land.[26] Prevailing questions of livability in the postwar period of the 1920s and 1930s deepened conceptions of marshes as unhealthy places. This sentiment was amplified by a new strain of malaria entrenched, throughout Turkey, by the expansion of rice cultivation. In 1926, the Turkish government passed legislation to combat malaria; its approach was mostly predicated upon the drainage of uncultivated marshes and swamps.[27] Antimalarial efforts began on the marshes surrounding Turkey's new capital city, Ankara, and with public health initiatives targeting the rural poor.[28]

Yet, wetlands were drained not only to combat malaria or expand agricultural production. Rather, the creation of new settlements coincided with the remaking of national Turkish communities. Newly reclaimed coastal deltas and inland marshes transformed into new areas of agricultural production attracted landless peasants who joined exchanged Muslim populations. Peasants migrated from villages further east on the Black Sea to the Kızılırmak Delta, alongside these earlier state resettlements and population exchanges. These migrants worked as herders and sharecroppers for landowners who had acquired property in the delta in the 1930s. The lower delta population grew from 8,500 in 1930 to 43,500 in the 1990.[29] Thus, the lived delta landscapes of seasonal grazing, hunting, and fishing changed rapidly during the first decades of the Turkish Republic.

The passage of the 1950 Law of Drained Wetlands and Reclamation boosted state-led projects of drainage, delineating how newly drained land should be redistributed to farmers.[30] After the 1953 founding of the Turkish governmental State Hydraulic Works (Devlet Su Işleri, henceforth DSI), modeled upon the United States Army Corps of Engineers and its Reclamation Authority, this new agency became responsible for all water management and infrastructure projects, including wetlands. Canals built under the aegis of the DSI continued to drain the Kızılırmak wetlands, allowing for the expansion of agricultural areas and the irrigation of fields for year-round cultivation. These canals transformed ecologies and economies. Agricultural and urban wastewaters were redirected to the shallow wetland lakes near the coast, facilitating wet rice agriculture, which, by 2006, accounted for half of the delta's irrigated agricultural land.[31] Rice demands larger intakes of water, and its runoff rich with chemical pesticides, herbicides, and fertilizers, transforms wetland plants and animals in dramatic and varied ways.

Beginning in the 1990s, many other scientists, NGOs, residents, and bureaucrats in neighboring Samsun, a port city of half a million residents, came to reimagine the Kızılırmak Delta, a fertile alluvial plain home to tobacco, melon, pepper, and cabbage fields, rice paddies, and herds of livestock grazing in the lower plains. The coastal marshes of the delta, long cast as unproductive, treacherous, and unhealthy, were newly cast as a font of biological and cultural value, at risk of disappearing in the face of urban, industrial, and agricultural pressures.[32] As scientists, bureaucrats, and city dwellers have turned their gaze to the wetland, the 25,000 rural farmers living in the delta have simultaneously come to grapple with these new denominations of value. While they

have largely ignored the formal denomination of "wetland," farmers have occasionally appropriated it to their advantage—even as they remain marginal to others' imaginaries of ecological value and care. Thus the delta has become a locus of varied and conflicting nationalist, international, and civic claims about ecology.

BUREAUCRACIES OF WETLAND CONSERVATION

While Ankara intensified national drainage efforts, government agencies were participating in a series of international initiatives to define wetlands and establish policies.[33] From their outset, Turkish projects of drainage and irrigation and the emerging interest in wetland conservation intersected. Rather than an abrupt shift, it is important to understand continuities in the centralized management of wetlands: first as marshes to be drained, and then wetlands to be conserved, with both visions underscoring ideas of improvement and national development.

The category of the wetland was initially produced in the early 20th century by Euro-American natural scientists, birders, and hunters concerned with the transnational loss of waterbird habitats. Towards the middle of the century, scientific and legal categories of the wetland expanded and proliferated, coming to encompass habitats as different as Irish peat bogs, Mediterranean river deltas, and Indonesian mangrove swamps. Several scientific conferences on the subject culminated in the Convention on Wetlands of International Importance ratified at Ramsar, Iran, in 1971. The Ramsar Convention continues to hold sway over national wetland conservation policies. A total of 168 countries have since joined the convention—including Turkey, which became a party in 1994—and many of them have implemented national legislation that regulates the conservation, preservation, and development of areas each recognizes as wetlands.[34]

Turkish scientists had participated in scientific wetland conferences predating the country's joining the Ramsar Convention. For example, in 1967, Turkey played host to a "Technical Meeting on Wetland Conservation" organized by the International Union for the Conservation of Nature.[35] Participants discussed large-scale wetland drainage, agricultural development, and ecology; foreign delegates commented on the ubiquity of drainage they had observed throughout Turkey. The representative of the DSI, then a department of the Ministry of Energy and Natural Resources, spoke at the conference about the Turkish government's twin objectives of drainage, specifically, malaria eradication and agricultural development.[36] He described the "typical and widespread wetlands" of Turkey, estimating that "150,000 hectares have been drained, and the remaining 50,000 are scheduled for drainage."[37] One-third of drained areas, he reported, had been transformed into agricultural fields. The rest had been planted with eucalyptus trees, or turned into rice paddies and reserves for fishing, grazing, and hunting.[38] Turkish and IUCN representatives disagreed as to whether wetland drainage would help mitigate soil erosion, as DSI experts argued, or further contribute to nutrient depletion in the soil. Tansu Gürpinar, representing the National Parks department, then part of the Ministry of Agriculture, emphasized the educational and scientific value of the country's first bird sanctuary on the wetlands of Lake Manyas.

This conference exemplified a broader tension between the accounting of wetlands as unproductive sites awaiting drainage, and wetlands as areas to be preserved for

scientific purposes. Both projects, however, were thoroughly national, and nationalist, even as they appropriated international categories and techniques. The Kızılırmak Delta was soon caught between imperatives of agricultural development and those of wetland conservation. In the late 1970s, state planning institutions and local environmental organizations began to plan for the creation of a nature park in the delta—coinciding with plans for drainage and irrigation expansion, and the construction of dams upstream on the Kızılırmak River.[39] Yet, responding to pressure from rural villagers, who had heard of restrictive measures at other newly established conservation areas, authorities decreased the extent of the newly established reserve.

In 1994, as Turkey joined the Ramsar Convention, the Kızılırmak Delta became a *SIT Alanı*—a status that protects natural or cultural areas from construction. Two years later, the Ministry of Agriculture and Settlement and the Ministry of Environment jointly developed a comprehensive plan to define conservation areas and regulate land use. Rural residents continued to resist conservation regimes, which prevented them from cultivating, selling land, and building in the conservation area. Conservationists were following a classic model of "participatory conservation" whereby academics and experts would teach rural residents about sustainable practices rather than making them equal parties in conversations about what conservation should entail.[40]

In 1998, the coastal areas of the Kızılırmak Delta became Turkey's eighth Ramsar site. According to a booklet published by the Ministry of Environment, the delta was an ideal "open laboratory for scientific studies." Its author noted the delta's contribution to "the economy of the region by its fisheries, reed cutting, and livestock grazing," with recreational activities as a side benefit.[41] This characterization drew from the new concept of ecosystem services—the benefits, in dollar terms, wrought of natural ecosystems.[42] Since the ratification of the Ramsar Convention, Turkey has increased the number of "Wetlands of International Importance" from four to fourteen sites, establishing a "Regulation for the Protection of Wetlands" in 2002 and revising it substantively in 2005 and 2014.[43] In 2009, Turkish universities, the government, and environmental NGOs collaborated to organize the first of a series of biannual national conferences on wetlands.[44]

A decade after the nomination of the Kızılırmak Delta's coast as a Ramsar wetland, a group of state officials, university scientists, and NGO staff prepared the first management plan for the delta. The document compiled research on the site's hydrology, vegetation, economy, water quality, land use, ecology, geology, geography, and sociology. In the preface, a biologist expressed the wish that management would be conducted with the "real owners of the Delta: the locals living in the surrounding villages."[45] As I will show, this would mostly remain wishful thinking. As the delta became a valuable wetland, it was simultaneously recast as a site of ecological degradation, of impending disappearance. Yet, there is no agreement among resident and expert communities over what exactly is degrading and disappearing, and what should be done. The creation of scientific knowledge about the delta's ecological and rural life is one of the ways in which wetlands are made meaningful categories of place for environmental advocates, bureaucrats, and scientists. In the following section, I show how the ways in which scientists' care for the wetland emerges from their everyday practices of ecological field research—such as bird counts—and, more broadly, to a model of residential science.

DISAPPEARANCES AND DISAGREEMENTS: CONTESTED PRACTICES OF CARE AND LIVELIHOOD

On an August afternoon in 2012, Dr. Kiraz Erciyas Yavuz and I are driving from her laboratory at the University in Samsun to the university's ornithological research station in the Kızılırmak Delta. Kiraz has been conducting research in the Kızılırmak Delta for many years, and participated in writing the Turkish government's management plan for the delta. From the bustle of Samsun, we follow the Black Sea coastline westward. Farmhouses are perched on the lush green hills. Tobacco fields yield to rice, peppers, tomatoes, leeks, sugar beets, and corn. We reach Engiz, formally renamed "Ondokuz Mayıs" in 1961, a dense settlement of tall apartment buildings punctuated by hardware and farm supplies stores. The main road continues towards the city of Bafra, but we take an unpaved road towards the conservation area, passing through forest swamps at the edge of the village of Yörükler.

Yörükler is a general term for nomadic people, and today's residents claim their origins in pastoral communities from the uplands who settled in the coastal plains with the transformation of "unproductive" marshes and swamps into agricultural fields of cash crops in the first half of the 20th century. Over the last decade, the swamp forest—*subasan* or *longoz*—has become a favorite destination for urban nature lovers and natural scientists.[46] In the winter, trees are submerged in water, and in the spring, nature photographers flock to snap the blossoming water lilies and ranunculus (*düğün çiçeği*) through telephoto lenses. Beyond its draw for photographers, the forest is an equally popular stop for nature education camps.

Scientists, environmental advocates, and the national parks officials with whom I visited the forest in subsequent years, would invariably point out small patches of melon fields planted within the conservation area. Environmentalists blamed the deforestation of the swamp, symbolized by the offending melons, on villagers, and the failure of local authorities to enforce conservation. When I interviewed them, farmers in Yörukler spoke of their clandestine planting as deriving variously from economic need, increasing land scarcity, complicated accounts of heredity, land tenure, and social mobility aspirations. Yet on a broader level, farmers are merely continuing a process begun in the 20th century: the transformation of coastal wetland and swamps from collective hunting and fishing grounds and grazing pastures into private agricultural lands. This continuity is also evinced in their continued gathering of wild species, sold to middlemen and distributed to national and international markets. Of particular use are reeds used for roof thatching, sharp-pointed rush (*goga*) for weaving and ornaments, and leeches for medical use.[47]

Kiraz and I pass by a sandy stretch of coast, and she points to a neighborhood of beach houses built as vacation residences. These houses, she explained, were sold by villagers holding customary rights to urban middle-class vacationers—a transition, she qualifies, without legal standing. Still, the new owners had successfully mobilized against a court order to tear the houses down. A few hung Turkish flags on their windows as a patriotic claim to legitimacy. State officials, farmers, scientists, and environmentalists repeatedly described the cluster of beach houses as an eyesore, a material manifestation of corruption, and a cause of ecological degradation.

Yörükler farmers would articulate different grievances. A relatively affluent returnee from Germany told me in 2012 that authorities had prevented residents from building wooden infrastructures for ecotourism, the result of a former mayor's efforts to develop the coast as a commercial beach. Other Yörükler farmers complained about the lack of action against the illegal beach houses, and about the construction of the park's visitors' center and other administrative buildings in stone and cement. Why, they asked, were they being prevented from construction in more sustainable materials, and benefiting from the influx of new visitors? In 2015, the beach houses would eventually be demolished. Yet rural residents remain caught between competing national mandates of agricultural expansion, of profitable tourist development, and of ecological conservation.

As we continue to drive towards the ornithology research center, I expect Kiraz to recount adventurous stories of rare bird sightings, or field encounters with hunters and dangerous wildlife. Instead, she begins to talk about water and infrastructure. She describes a complex landscape in movement, characterized by different kinds of water—open water, freshwater, and semisaline lakes, marsh vegetation, sand dunes, woodland, and irrigation. The construction of water dams upstream on the Kızılırmak River in the last decades, she explains, has stopped the flow of sediment in the river. As a consequence, the Black Sea has been eroding the deforested coastal strip: eventually, she says, the last remaining lakes will join with the sea.[48] Gesturing towards the lake on our left, and at the drainage canal on our right, Kiraz speaks worriedly about agricultural runoff that had previously been draining into one of the wetland lakes now being redirected into the Black Sea itself. The adverse ecological effects of the drainage canal in question, posed against its agricultural advantages, is and will remain a heated subject of disagreement among residents, conservationists, scientists, and state officials. It is a complicated matter, with supporters and detractors within each group.

We park in front of the ornithological research station, a wood and concrete building at the edge of the lake, unpacking groceries and field supplies. A small group of young men and women, clad in colorful cotton t-shirts and jeans and green rubber boots, greets us at the door. Twice a year, Kiraz and two colleagues move to the research station for nine weeks, bringing along student volunteers from all over Turkey. I joined the camp twice, in 2012 and in 2013, and visited subsequently while living with farmers in Doğanca. Some students are already amateur birders, and many join simply out of a desire to experience the outdoors. Students tell me they enjoy the camaraderie of the camp, the communal division of tasks, and working in the quiet landscapes at the edge of the lake. Most volunteers, I observe, leave the camp with an enhanced knowledge of local ecology and birds, and with new emotional ties to the Kızılırmak Delta's wetlands.

Ornithologists have set up around forty nets in the area. Starting before sunrise and ending at sunset, students take turns walking from net to net, gently disentangling captured birds from the nets, and placing them in the cloth bags, which they then mark with the net number. Kiraz or, depending on the week, one of her colleagues, sits at the lab desk and examines, measures, and places a thin and light metal ring marked with a unique code around each bird's leg. One student takes notes of measurements and other characteristics in the field book; the stunned birds are then released outside. Kiraz asks students to identify the birds, and they flip through ornithological guides,

aimlessly, until Kiraz shows them how to undertake the task, pointing out the correct species denomination.

Until 2011, the research station was lodged in the fishing cooperative's building, farther along the gravel road from its current location. Now, after a day's work, researchers still sometimes walk down the road to go and drink tea with the fishermen. The two different groups use essentially the same nets: fishers deploy them to catch carp, mullet, zander, and crayfish in the lake, and ornithologists use slightly modified versions to capture and study wetland birds. While ways of knowing the wetland through bird research and through fishing may seem opposed, the nets remind one where these activities overlap: both rely upon a knowledge of place emergent through practice, scientific and local knowledge, and national regulation—and for the fishers, market prices of fish. Fish and birds also become "sentinel" animals, through which both scientists and fishers can detect and assess the ongoing degradation of wetland environments.

With over 350 recorded bird species and millions of migratory and sedentary birds, the delta's local nickname of "bird paradise" (*Kuş Cenneti*) is unsurprising. Yet this term is not exclusive to the Kızılırmak Delta, but common to all conservation wetlands in Turkey. This shared denomination reflects, in fact, mid-20th century notions linking the value of wetlands to the provision of habitats for waterbirds. The Turkish term *Kuş Cenneti* is the legacy of the German zoologist and conservation scientist Kurt Cosswig, who worked in Turkey in the 1930s–50s. The term's popularity is to the chagrin of local scientists, who would rather wetland visitors consider holistically the ecological interconnectedness and biodiverse habitats in places like the Kızılırmak Delta.[49]

Kiraz and her colleagues' work in the Kızılırmak Delta is of the sort that historian of science Robert Kohler has called "residential": these are ecological research practices based on long-term residence in a place, whereby scientists come to know the specificities of environments, their human and nonhuman occupants, and the relations of different coexisting species. Kohler contrasts a residential model to field practices privileging breadth over depth. Place, he argues, shapes the practices, theories, and ethics of the field scientist.[50] I would argue, inversing his argument, that scientific care practices—such as those evidenced in a wetland laboratory—produce place. Kiraz and her colleagues are deeply involved in wetland advocacy initiatives such as drafting wetland management plans and reports, applying for international conservation statuses such as Ramsar and UNESCO sites, writing grant applications, and participating in local public meetings. In short, they leverage their scientific work and their care relations to enlist the delta in national and international conservation.

The pointed use of care here foregrounds vital cultural and affective commitments. Care practices are multiple: care for the birds, for ecology, for students, for landscapes, and for birders, colleagues, and friends overlap. But while care sustains relationships—for instance, those between birders and fishermen, and students and the migratory birds—others are destroyed: for instance, the implementation of environmental conservation boundaries and regulations in the delta generated new conflicts over rural residents' livelihoods. Scientists' notions of "good" and "bad" infrastructure are based on an understanding of the wetland ecology as centered on biodiversity, birds, and researchers. And often, these notions fail to account for the care practices of rural residents—for instance, care for market crops, for household economies, tied to care for kinship, community, and social mobility. But who, exactly, is invited to participate

in care of the delta as a wetland? The next section addresses the connection of conservation imperatives to varied notions of rural farmers' participation in the production of the delta wetlands.

IDIOMS OF PARTICIPATION, PRACTICES OF EXCLUSION

"Without accounting for the farmers' livelihood, we are bound to lose their support," Ali Kemal told a group of city officials and university professors at a 2016 planning meeting for a wetland conference in the Kızılırmak Delta. "And without their support, conservation initiatives will fail." Ali Kemal's warning invoked the category "local people" (*yerel halk*), identified through personal encounters with delta farmers as well as through pastoral ideals rooted in nationalist understandings of the connection between land and identity. This category has recently become central to Turkish wetland advocates' ecological imagination of the Kızılırmak Delta. Proponents of conservation recount conflict, sometimes violent, with delta residents in the 1980s and 1990s, as they worked to define the boundaries of the conservation area. Yet recently, many told me, local farmers have become more open to conservation initiatives.

Residential scientists develop deep personal attachments to the landscapes and waterscapes of the lower delta. They also cultivate these attachments outside of their research work, organizing field visits with their families, for instance, or taking and sharing nature photographs. Many, such as Ali Kemal, also work to sustain long-term relationships with delta farmers.[51] I situate participatory practices like these as central to knowledge formation processes that legitimize scientists to speak for the wetland, as they position themselves as authoritative intermediaries between farmers, Turkish state and scientific institutions, and scientific organizations such as Ramsar.

During the course of my research in the Kızılırmak delta, I frequently heard the phrase "the delta has many owners, but no one who takes responsibility for it" (*deltanın sahibi çok, sorumlusu yok*). The ubiquity of this idiom, I propose, owes to its ability to be interpreted in two contrasting ways, with each interpretation reflecting a different understanding of delta governance. For some, this expression conveyed the perceived need for a stronger state presence in overseeing and coordinating the work of different departments and associations in the delta. Yet others, by contrast, envisioned greater grassroots civil society (*sivil toplum*) participation in decision-making processes. Farmers are at the center of agricultural development plans for the region, but their perspectives remain marginal to conservation scientists and wetland advocates, even as they figure in imagination of the wetland as a site of valuable ecological livelihood and traditional practices.[52]

One elderly rice farmer recounted his grievances during a conversation in his farmhouse, in May 2015. "The state," he said, "came here and told us: 'you will grow this and this crop, in this and this way.' Now it comes in and tells us: 'this is a conservation area. You can't hunt. You can't grow rice here.' Soon they will prohibit grazing our water buffaloes. The state just comes in and tells us what to do." But Aladdin and Cemile, who hosted me for three months in 2014, had a different perspective. Aladdin enjoyed recounting how "Ankara" (by which he meant a state official working for a program for tourism expansion in the delta) had inspected and certified their house as appropriate for hosting tourists. Another small-scale farmer, Neriman, asked me if I could help her

apply for state support to start a cooperative for selling local products made by women. Many residents continued to perceive conservation as an extension of state authority, or as merely the interests of urban elites, which would invariably result in further marginalization. But other rural residents, already reliant on the state for pensions, health care, and disability subsidies, also had expectations that the "state" would protect and support them in wetland conservation, as it did in the context of agricultural subsidies.

In September 2014, as the "anthropologist-in-residence" in the delta village of Doğanca, I was asked on short notice to invite "local farmers" to speak to students at the wetland school. I tried, and failed, to find women who were available to participate. Some were reluctant, others were selling produce at the weekly town market, and still others were cooking for a funeral. But three male farmers, whose families had hosted me, agreed to come to the meeting. One, Avni Koparan, drove with me from the village to the wetland visitors' center, where he was to address the group of students and professors, to talk about his rice farming practices.

As Avni and I approached the village center, scattered farms surrounded by golden brown rice fields and pepper fields dotted in green and red gave way to denser settlement. Avni drove past the school, the mosque, and the old municipality building, now empty, the abandoned gas station, and an aspirational bus stop built for a route that never existed. Two-story houses in unpainted concrete hid behind low walls and metal gates alongside the road. Dogs ran out to the road to bark at cars and unfamiliar passersby. Pungent smells entered through the open windows: the sticky smell of manure, the bittersweet scent of silage, the warm aromas of hay, the pungent smell of gas. These were tempered with the residual fragrance of firewood and boiling milk, and the thickness of fried vegetables and meat stews.

This was the main road connecting Bafra to Doğanca and then to the wetland conservation area, where it became narrow and unpaved; visitors' experiences of the lower delta are invariably tied to the materiality and spatiality of this one road. We drove past the last rice fields, reaching the marshes. The road finally passed directly in front of the visitors' center. Many residents call it *kule* (tower) because of its tall wooden bird observation structure. In a cloud of dust, Avni turned to park between an excavator machine and a bus. The students sat down, in a semicircle, below the observation tower. "What is the relationship between rice fields and the wetland lakes?" students asked Avni and the other farmers. "Are farmers experiencing problems resulting from the overuse of pesticides and fertilizers? How do they introduce new crops and technology? What are the benefits and the drawbacks of letting the water buffaloes graze in the delta? Would it be possible to grow organic?" Avni and the other farmers replied with stories and examples from their own farms, prompting the students to ask new questions. Here is an example of participation at work, I thought to myself, jotting down, on my notebook: "farmers are performing expertise."

Soon, the professors began to argue amongst themselves about the students' questions. One said that the only possible future for the delta was in organic agriculture. Another replied that this course would be practically impossible; farmers should instead be educated in the proper use of pesticides and fertilizers. Avni sat back and listened politely, occasionally nodding. Later, we drove back together to Doğanca. He enjoyed the students' questions, he told me. But, he added, university professors consistently failed to address villagers' actual problems. A new disease had been destroying his and

others' rice crops, he noted, particularly in the less windy areas. The delta's soil and water, he believed, could no longer sustain the heavy use of fertilizers and herbicides. The university, he added emphatically, did not reach out to the farmers to address their real needs.

In contrast to approaches in participatory conservation that emphasize the involvement of different "stakeholders," I contend that the ways in which wetland advocates implicate farmers are themselves implicated in historical imaginations of the Turkish peasant—fundamentally attached to romanticized ideas of the rural village as the repository of Anatolian tradition. These ideas build upon a legacy of nationalist imaginaries positing farmers to be the spiritual center of the nation, even when politically and economically marginal. Since the delta settlements are heterogeneous—the result of shifting nationalist politics and economics—"locals" only exist when invoked as such, forming an imagined delta community. Similarly, farmers invoke "the state," or "the university" in general, as abstract and essential categories—abstractions made real, however, by the rapid transformation of land and water they inhabit. At the same time, the ways in which encounters between scientists and farmers take place reflects less abstract ideological notions and, rather, the idiosyncratic friendships and collaborations that have flourished through years of scientific and advocacy work in the field and sometimes shared, but often divergent, visions for the delta's futures.

KNOWING DELTA WATERS: IRRIGATION, DRAINAGE, AND THE MATERIAL REMAKING OF THE WETLAND LAKES

In the contemporary delta, residential scientists' care for the wetland arises from and is practiced through their material and scientific engagements with the multiple kinds of water and infrastructure that make and unmake the delta's ecology. The varied kinds of knowledge about and material engagement with water and infrastructure shed light on a multiplicity of visions of the delta as a scientific wetland. These days, however, farmers in Doğanca experience irrigation water as scarce. One day in the summer of 2015, Avni was teaching me how to count banknotes by holding them between my fingers, tabulating the amount needed to pay the energy bill for the water pumps used to irrigate rice. More money—a set amount per crop, field area, and type of canal—would go to the irrigation cooperative.

As I counted, we spoke about infrastructure. Avni believed that the irrigation project, years in the making, was lagging behind agricultural expansion. For rice growing, accurately regulated water flows are absolutely crucial. Yet access to scarce irrigation water, and securing the right provision of water at the right time, is mediated by personal relationships with irrigation authorities. Scarcity for some—for instance, farmers, water buffaloes, aquatic species—thus emerges as water is provided in abundance for water-thirsty market crops such as rice, which, according to many farmers, demand more water than the new irrigation system could provide.

At the wetland school of 2014, students walked alongside irrigation and drainage canals, and tested water quality in the wetland lakes. We learned about a newly built canal to fill the lake with "clean" river water—but which remained empty because, according to university scientists at the wetland school, different state agencies could not agree on the amount of water that was in fact needed to sustain a wetland ecology.

The question was not simply that of water quantity (and quality), but about when water would flow into the lake, and how the effects of "irrigating the wetland" would be monitored. Students were concerned about the effects of water scarcity on wetland ecologies rather than on agriculture, yet they also learned to see the two as connected, and to care about the effects of agricultural water flows on wetland ecology.

One afternoon, for instance, all the students were struggling to keep their eyes open in the semidark classroom in the visitors' center. We had spent the previous days in the muddy meadows, nets in hands, capturing and naming all the insects we could capture, and then bagging and drying plants for an herbarium. An irrigation expert was lecturing about the delta's irrigation infrastructures, with slides upon slides of maps glowing in the dark. At the back of the room, someone was softly snoring. The professor mentioned the newly built canal redirecting runoff, previously flowing to the wetland lakes, to the sea. Suddenly, a student raised her hand and exclaimed, emphatically: "but this just takes the pollutants somewhere else! We are not addressing the root of the problem here." Others woke up from their torpor and joined in, describing cans of pesticides and herbicides abandoned in the canals. They talked about the shallow lakes getting shallower and eutrophic, and debated ultimate responsibility for the wetland ecologies' futures. It was a heated conversation, and students were practicing their newly forged sense of care for this delta that they did not previously know, and which they had now come to know as an endangered ecology, calling for help.

The farmers' perspective on the canal, unsurprisingly, was connected to its effects on their farming practices. This was further complicated, however, by several overlapping projects of delta development—which often clashed in their material realization. Despite having initially agreed to the opening of the new drainage canal, farmers in Doğanca realized, after the fact, that the drying lake and the expansion of rice fields also meant less pasture for their water buffaloes. The number of water buffaloes had rapidly increased in the past decade thanks to a new program of state subsidies. Small-scale farmers like Cemile and Aladdin faced increasing costs for feeding their water buffaloes because they had to purchase hay and feed supplements beyond the corn they already grew in their small field. That the cultivated landscapes of the lower delta were rapidly changing and expanding also meant that the older common pastures, where many water buffaloes are left free to graze the entire summer, were now encroached by new rice and corn fields. And lower levels of lake waters greatly reduced the area of mud where water buffaloes could cool off from the summer's heat.

In the summer of 2014, delta residents took advantage of a technical "failure" in one of the cameras propped on the roof of the visitors' center. The cameras were used to perform bird counts and observe wildlife. They also served to control illegal hunting and fishing, and other potentially illegal activities occurring in the conservation area. One evening, as the broken cameras stopped recording, someone drove an excavator machine to crack the drainage canal open, letting water flow into the drying marshes at the lake's edge. This allowed the village's water buffaloes to graze and cool in the mud. It was in this water, thus produced through an act of "everyday resistance," that we later became water buffaloes and felt the wetland.

Driving to the lake one evening, a group of farmers and I came across the director of the conservation area just as he had discovered the newly opened stream of water. For state officials, top-down regulations and control against illegal resource use is central

to the preservation of the national and natural value of the wetland. "This is a crime!" he exclaimed, turning to me to explain what had happened and pointing at the flowing water. "Someone knew that the camera was not working and that I was not in the office—who did this?" He asked us. My companions feigned ignorance. The opening of the canal was an open secret in the nearby delta villages. While the newly created mud land would certainly not last long, the autumn rains would soon come, and then the buffaloes would be taken inside the barns for the winter.

CONCLUSION

In this article, I have brought ethnographic research in conversation with environmental histories to show that the making of Turkish wetlands involved creating and stabilizing scientific categories of the wetland, integrating them into national imaginaries, and intervening materially on landscapes. While Turkey is often imagined as merely responsive to global currents of environmental conservation, ethnographic analysis and histories of policies and environments demonstrate the specificity of Turkish experiences. We cannot understand what it means to live in, and care for, wetlands, without analyzing landscape transformations, nationalist politics, histories of science, and everyday practices of knowledge formation.

In the last century, the Kızılırmak Delta was reshaped through state-led displacement and relocation of ethnic and religious minorities from and into wetland landscapes, programs of malarial control, drainage and reclamation, agricultural expansion, water infrastructure, and top-down conservation measures. Its coastal marshes, in the process, were transformed into productive Turkish agro-economies. In the wake of these environmental, infrastructural, and demographic transformations, Turkish scientists participated in the international production of wetland science and conservation policy. These shifts were concurrent with the appropriation of the international category of wetland into Turkish national imaginaries, as well as to the material remakings of landscapes. The delta emerged as a valuable wetland ecology, suitable for conservation, at the very peak of agricultural expansion in the delta.

In places like the Kızılırmak Delta, scientists have formed varied senses of care and commitment to wetlands as valuable, fragile places. Their care practices are varied and multiple: care for birds, for teaching, for friendship, for leisure time, for nonhuman forms of life, for differentially imagined futures, for the past, for knowledge and science, for national development, for local governance. This work of care has rendered the delta the subject of imaginaries of ecological value. These imaginaries are predicated upon the continuing production of scientific knowledge. The wetland school I examined in this article was one site of this ongoing production.[53]

These senses of care contrast with the livable natures of rural residents, for whom the delta is also a site of production: of crops, animals, kinship ties, economy, identity, and social mobility. And yet, wetland conservation in the current moment is actuated through situated encounters and collaborations between delta residents and scientists—invoking each other as stewards of each other's projects. For both groups, the delta is a place of care and work. In this sense, I approach wetlands as *vernaculars*: the language of wetland conservation is not to be taken as a given, but, rather, should be seen as reflective of social and cultural positionings, relations, and practices.[54]

Foregrounding competing productions of place brings to the fore the political stakes of ecology. The poignant social and cultural meanings that wetland categories have acquired for different social groups in contemporary Turkey are rooted in the valuation of ecology. At a historical moment of increasing authoritarian rule and repression, wetland conservation provides a venue in which residents of Turkey advance the values of community formation, democratic scientific processes, and hope for shared futures.

NOTES

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[1]On the making of natural resources, see Tanja Richardson and Gina Weszkalnys, "Introduction: Resource Materialities," *Anthropological Quarterly* 87 (2014): 5–30; and Paul Robbins, *Political Ecology: A Critical Introduction* (West Sussex, UK: Wiley-Blackwell, 2012).

[2]Elsewhere, I have written on scientific sense making as embodied, and have connected such care practices to the notion of "livable natures" to point to the mutual constitutions of notions and practices of place, livelihood, and ecology. See Caterina Scaramelli "Making Sense of Water Quality: Multispecies Encounters on the Mystic River," *Worldviews* 17 (2013): 150–60; and Scaramelli, *Swamps into Wetlands: Making Livable Nature in Turkey* (PhD diss., Massachusetts Institute of Technology, 2016).

[3]Ethnographic research was conducted in Turkish; all translations in this article are mine.

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[6]Joan C. Tronto, *Moral Boundaries: A Political Argument for an Ethic of Care* (London: Routledge, 1993), 103.

[7]Aryn Martin, Natasha Myers, and Ana Viseu, "The Politics of Care in Technoscience," *Social Studies of Science* 45 (2015): 1–17; Eben Kirksey, *Emergent Ecologies* (Durham, N.C.: Duke University Press, 2015); Maria Puig de la Bellacasa, "Making Time for Soil: Technoscientific Futurity and the Pace of Care," *Social Studies of Science* 45 (2015): 691–716.

[8]Caring for an environment, like caring for any object or relationship, entails practices of knowing, organizing, classifying, and selecting; it is telling that to "care" and to "curate" are etymologically connected in English and in Romance languages. Curators always follow an imagined narrative, and address a particular audience.

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[26]David Blackbourn, *The Conquest of Nature: Water, Landscape, and the Making of Modern Germany* (New York: W.W. Norton & Company, 2007); Craig E. Colten, *An Unnatural Metropolis: Wresting New Orleans from Nature* (Baton Rouge, La.: Louisiana State University Press, 2006); Timothy Mitchell, "Can The Mosquito Speak?," in *Rule of Experts: Egypt, Techno-Politics, Modernity* (Berkeley, Calif.: University of California Press, 2002), 19–53; Randall M. Packard, *The Making of a Tropical Disease: A Short History of Malaria* (Baltimore, Md.: Johns Hopkins University Press, 2007); Frank Snowden, *The Conquest of Malaria: Italy, 1900–1962* (New Haven, Conn.: Yale University Press, 2008); Sandra Sufian, *Healing the Land and the Nation: Malaria and the Zionist Project in Palestine, 1920–1947* (Chicago: University of Chicago Press, 2008).

[27]*Sitma Mücadelesi Kanununa Bazı Mevad Tezili Hakkında (1/117) Numaralı Kanun Layihasi ve Sihhiye Ve Bütçe Encümenleri Mazbataları* (Türkiye Cumhuriyeti Başvekalet Muamelat Müdüriyeti: 6/885, 1928), 23–26; Zafer Koylu and Nihal Doğan, "Birinci Dünya Savaşı Sırasında Osmanlı Devleti'nds Sıtma Mücedelesi ve Bu Amaçla Yapılan Yasal Düzenlemeler," *Türkiye Parazitoloji Dergisi* 34 (2010): 209–15.

[28]Kyle T. Evered, and Emine Ö. Evered, "Governing Population, Public Health and Malaria in the Early Turkish Republic," *Journal of Historical Geography* 37 (2011): 470–82; Kyle T. Evered, "Draining an Anatolian Desert: Overcoming Water, Wetlands, and Malaria in Early Republican Ankara," *Cultural Geographies* 21 (2013): 1–22; Feza Günergun and Şeref Etker, "From Quinaquina to 'Quinine Law': A Bitter Chapter in the Westernization of Turkish Medicine," *Osmanlı Bilim Araştırmaları* 14 (2013): 41–68; Kyle T. Evered and

Emine Ö. Evered, "A Conquest of Rice: Agricultural Expansion, Impoverishment, and Malaria in Turkey," *Historia Agraria* 68 (2016): 103–36.

[29]These histories came up frequently in interviews I conducted with residents of delta villages between 2012 and 2015. See also Yılmaz, *Bafra Ovası*.

[30]"*Bataklıkların Kurutulmasi ve Bunlardan Elde Edilecek Topraklar Hakkinda Kanun,*" Resmi Gazete 23.I:7413 (1950): 409–12.

[31]Ali Kemal Ayan, *Kızılırmak Deltasında Doğal Kaynak Kullanımı* (Samsun, Turkey: Ondokuz Mayıs Universitesi, 2007); Özesmi, *Conservation Strategies*; Yılmaz, *Bafra Ovası*; Can Yeniyürt et al., *Kızılırmak Deltası Sulak Alan Yönetim Planı* (Ankara: T.C. Çevre Bakanlığı, Doğa Koruma ve Milli Parklar Genel Müdürlüğü, Doğa Koruma Dairesi Başkanlığı, Sulak Alan Şube Müdürlüğü, 2008). See also *Çeltik Ekimi Kanunu* 2030 (1936).

[32]On the Kızılırmak wetlands as valuable ecological as well as cultural sites, see Can Özgen and Beyhan Taş, "Ramsar Alanı Içinde Yer Alan Cernek Gölü Ve Sulak Alaninin (Kızılırmak Deltası, Samsun) Ekolojiv ve Sosyo-Ekonomik Önemi," *Tubav Bilim Dergisi* 2 (2012): 1–11; and *Kızılırmak Deltası Sulak Alan Yönetim Planı* (Ankara: T.C. Çevre Bakanlığı, Doğa Koruma ve Milli Parklar Genel Müdürlüğü, Doğa Koruma Dairesi Başkanlığı, Sulak Alan Şube Müdürlüğü, 2008). On endangerment, see Timothy Choy, *Ecologies of Comparison: An Ethnography of Endangerment in Hong Kong* (Durham, N.C.: Duke University Press, 2011); Ursula K. Heise, *Imagining Extinction: The Cultural Meanings of Endangered Species* (Chicago: University of Chicago Press, 2016); and Fernando Vidal and Nélia Dias, ed., *Endangerment, Biodiversity and Culture* (London: Routledge, 2015).

[33]On the continuity between drainage projects and the establishment of nature conservation areas—institutional, technological, and ideological, in the United States, see Wilson, *Seeking Refuge*.

[34]For a detailed account, see Scaramelli, *Swamps into Wetlands*.

[35]IUCN, ICBP, and IWRB, *Proceedings of a Technical Meeting on Wetland Conservation, Ankara-Bursa-Istanbul, 9 to 16 October 1967* (Morges, Switzerland: IUCN Publications, 1968).

[36]IUCN, ICBP, and IWRB, *Proceedings of a Technical Meeting*, 52. On the collaboration between the DSI and other state departments, see Metin Heper and Nur Bilge Criss, *Historical Dictionary of Turkey* (Lanham, Md.: Scarecrow Press, 2009), 109. On political debates about land reform, see Asim M. Karaömerlioglu, "Elite Perceptions of Land Reform in Early Republican Turkey," *Journal of Peasant Studies* 27 (2000): 115–41.

[37]IUCN, ICBP, and IWRB, *Proceedings of a Technical Meeting*, 52.

[38]Ibid., 51.

[39]*The Kızılırmak Delta* (Ankara: General Directorate of Environmental Protection, Ministry of Environment, Republic of Turkey, 1998).

[40]Özesmi, *Conservation Strategies*.

[41]*Kızılırmak Deltası* (Ankara: Turkish Republic Ministry of Environment, 1998), 10.

[42]Kathleen McAfee, "Selling Nature to Save It? Biodiversity and Green Developmentalism," *Environment and Planning* 17 (1999): 133–54.

[43]No. 25818, revised on 17 May 2005, and in April 2014

[44]The conferences took place in Bursa (2009), Kirşehir (2011), and Samsun (2013).

[45]Yeniyürt et al., *Kızılırmak Deltası*.

[46]The word *longoz*, meaning "swamp forest" in Turkish, is of Greek origins; Éva Ágnes Csató, Bo Isaksson, and Carina Jahani, *Linguistic Convergence and Areal Diffusion: Case Studies from Iranian, Semitic and Turkic* (London: Routledge, 2005), 338. Its synonym, *su basan,* means, literally, "that which steps in water."

[47]Uygar Özesmi, "The Ecological Economics of Harvesting Sharp-Pointed Rush (Juncus Acutus) in the Kizilirmak Delta, Turkey," *Human Ecology* (2003): 645–55; Ayan, *Kızılırmak Deltasında Doğal Kaynak Kullanımı*.

[48]See Yılmaz, *Bafra Ovası.*

[49]Barış Sancar et al., "Cernek: A New Bird Ringing Station in Turkey," *Ring* 27 (2005): 113–20.

[50]Robert E. Kohler, "Paul Errington, Aldo Leopold, and Wildlife Ecology: Residential Science," *Historical Studies in the Natural Sciences* 41 (2011): 216–54.

[51]For a detailed ethnographic account of the residents' own practices and livable natures, see Scaramelli, *Swamps into Wetlands*.

[52]For ethnographic analysis of the shortcomings of participatory approaches to environmental conservation, see Molly Doane, *Stealing Shining Rivers: Agrarian Conflict, Market Logic, and Conservation in a Mexican*

Forest (Tucson, Az.: University of Arizona Press, 2012); Lowe, *Wild Profusion*; Walley, *Rough Waters*; and West, *Conservation Is Our Government Now*.

[53]Educators at the "wetland school" sought to instill in the students a sense of care embodied in place, as the basis for acquiring and transmitting knowledge of the delta. For a report and evaluation of a later edition of the school, see Ali Kemal Ayan, Yeliz Genç Bekiroğlu, and Ahmet Dürüst, eds., *Kızılırmak Deltasında Bilim Işığında Doğa Okulu* (Samsun, Turkey: 2016).

[54]Benedict Anderson, *Imagined Communities: Reflections on the Origin and Spread of Nationalism* (London: Verso, 1983); Elizabeth Lantis, "Vernacular Culture," *American Anthropologist* 62 (1960): 202–15.