

Re-animating Virunga: Mapping Relational Ontologies Against Rwanda's Static Enclosures

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Abstract

The Virunga Forest and Mountains, spanning Rwanda, Uganda and the Democratic Republic of Congo, are more than a habitat for mountain gorillas; they form a transboundary milieu where diverse ontologies of land, life and relation intersect. Conservation infrastructures – national park boundaries, research stations and eco-lodges – embody one vision of Virunga: a bounded ecology to be preserved, studied and consumed through tourism. Yet these static enclosures disrupt other ways of dwelling.

This article traces how colonial imaginaries, originating in eighteenth- and nineteenth-century expeditions, crystallised into rigid borders that displaced the indigenous Twa. By contrast, Twa engagements reveal a relational ontology where forests are not resources to be enclosed but living fields of reciprocity and co-presence.

Through participatory action research, the article examines how a Twa community redrafts Virunga through

counter-mapping – articulating spatial knowledge that resists resettlement boundaries and Rwanda's Vision 2050. Drawing on Robert Rundstrom's critique of cartography, it contrasts colonial mapping as a technology of control with indigenous mapping as a collective act that enacts multiple worlds. These counter-maps thus emerge as transectional cartographies – ontological interventions that are, in effect, re-animating Virunga by reinstating the Twa and their relational ontology within its living ecologies.

Keywords

Rwanda, political ecology, critical cartographies, indigenous knowledge systems, environmental justice

One sentence summary

The article examines how Twa counter-mapping in the Virunga region challenges colonial conservation boundaries, revealing relational ontologies of land and proposing alternative, justice-oriented cartographies of dwelling.

Before the boundary

In 2018, the Rwandan state-owned *New Times* reported on the expansion of Volcanoes National Park (hereafter, 'the park'), funded by land donations from the African Wildlife Foundation.¹ The article depicts officials replanting trees, projects increased revenue from gorilla tourism and the construction of 'model' villages for neighbouring communities.² The park, a conservation enclosure, is central to the government's post-genocide *Vision 2050*, which uses architecture and urban planning to transform land use from informal, traditional and subsistence practices into standardised 'model' settlements.³ *Vision 2050* also re-orientes natural resources – farmland, forests, wetlands and lakes – toward cash crops, renewable energy, construction and

eco-tourism. The park is a central pillar in this neo-liberal dream, symbolising growth, sustainability and progress, and representing an ethnic unity with the landscape.⁴

Part of the larger Virunga bioregion spanning Rwanda, Uganda and the DRC, the park is a biodiversity hotspot and a critical habitat for the endangered East African mountain gorilla (*Gorilla beringei beringei*). The semi-nomadic Twa – historically egalitarian and reliant on hunting, gathering, and shared forest resources – were displaced as these landscapes became enclosed in the early nineteenth century. A photograph in the *New Times* shows a hand gesturing toward a large map highlighting park boundaries in green, while everything else – socio-ecological relations, human–nonhuman exchanges – is rendered void. [Fig. 1] Cartography historian J.B. Harley notes that maps, once reflecting a culture's worldview, became instruments of imperial power by the seventeenth century, used to justify land appropriation and control.⁵ By the late nineteenth century, colonial maps, despite inaccuracies, imposed Western visions onto African landscapes. The park accumulates these imperial cartographies, originally drafted by explorers seeking the mythical 'Mountains of the Moon'. I argue that the violence of these imperial cartographies persists in *Vision 2050*. The Twa, now 1 per cent of Rwanda's population, live outside the Virunga forests, divided into three national parks. Relocated alongside Hutu (85 per cent) and Tutsi (14 per cent) populations into model settlements, they have lost forest access and their population is declining.⁶

Geographer Robert Rundstrom observes that Western, text-based societies use maps to inscribe and control space, deliberately omitting non-Western ways of knowing.⁷ By contrast, indigenous, oral-based communities like the Inuit use maps as an intracultural tool to communicate their deep knowledge and cosmological entanglement with their surroundings.⁸ For these communities, mapping is a relational, ongoing dialogue performed through movement, not a static, complete result.

In 2009, I began work in Rwanda on a small community centre located in the wetlands of an informal settlement in Kigali, where rapid post-genocide urban transformation revealed tensions between modernisation and relational ways of dwelling with the land. In 2013, I collaborated with the German organisation Rhineland-Palatinate and local religious groups in northern Rwanda to assess government resettlement projects, during which I initiated mapping exercises with displaced forest communities. These exercises laid the groundwork for the maps and landscape models discussed in this article.⁹

In what follows, I explore how mapping relational ontologies can redraft Rwanda's static enclosures, which limit the Twa's socio-ecological relations and their aspirations

for inclusion. Rather than a neutral inscription of space, I treat mapping as a relational practice – co-produced through dialogue, gesture and performance between researcher, interpreter and participants. Through this method, we see how colonial visions shaped the Virunga – and how their logic can be bypassed through collective, transcultural map-making. Crucially, the counter-maps presented here seek to offer a symbolic space to articulate forbidden and difficult conversations around historical injustices, ethnic identity and ongoing marginalisation in Rwanda. They allow for a re-imagining that enables a form of enchantment through hopeful articulation. The Twa's counter-mappings articulate dreams of forest dwelling and nightmares of forced resettlement, offering a different ontology of dwelling: one that is dynamic, spatio-temporal and entangled with human and non-human life. In stark contrast, the imposed, static settlements embody the complete cessation of these dialogues, leading to a profound sense of abandonment and disenchantment with the possibilities of modern societal existence.

The article proceeds in three sections. The first traces imperial cartographic visions of the Virunga Mountains and their role in severing the Twa from their forests.¹⁰ The second blends participatory action research with counter-mapping to document the Twa's forests and resettlement experiences, reflecting on the potentials, limitations and ethics of this practice.¹¹ The final section presents digital animations of these counter-maps as 'transectional cartographies' that reinstate the Twa into the landscape, reanimating static enclosures of conservation and resettlement and inviting a rethinking of the architectures underpinning the fantasy of *Vision 2050*.¹²

Imperial visions and the cartographies of enclosure

The 1884 Berlin Conference formalised the partition of Africa among seven major European empires, legitimising their colonial vision.¹³ Building upon Europe's ongoing scramble for Africa, this vision relied on maps as evidence to substantiate claims. Imperial cartographies were often produced overseas with little knowledge of physical or local conditions, resulting in deeply idealised and fictionalised borders, frequently inherited from inaccurate reports and romanticised explorer sketches. To make these visions verifiable, colonial cartographers sought geographical landmarks or, failing that, drew borders along astronomical lines of latitude and longitude.

There are eight main mountain peaks in the Virunga Mountains straddling the national and conservation borders between Rwanda, Uganda and the DRC. The Belgian, German and British empires used these geographical landmarks to carve up and anchor their colonial border claims onto the forested landscape.¹⁴



Fig. 1: Government official indicating the border and site of the Volcanoes National Park extension on a government map. Photo: Timothy Kisambira, 2018. Source: The New Times.

Lying within Rwanda, the southern face of this mountain range is known as the Virunga, an anglicisation of the Kinyarwanda word *ibirunga*, meaning 'volcano'. The northern face straddles Uganda and the DRC and is known as 'Mufumbiro' in the local dialect of Rufumbira.¹⁵ This contiguous, lush bioregion is rich in soils, flora, fauna and minerals, making it not only the most densely populated and cultivated landscape in East Africa but also one of its most historically contested. From 1884 onward, Belgium, Britain and Germany competed fiercely for this prime colonial territory – prime for European settlement and industry – using maps not only as evidence of control but also to impose their interpretations and disregard indigenous knowledge. The British claimed the Virunga Mountains, citing distant sightings by explorers John Hanning Speke (1863) and Henry Morton Stanley (1876).¹⁶ While searching for the headwaters of the Nile, Speke claimed to have seen a prominent peak, identified to him as the mythical Mufumbiro, which Western explorers believed was part of the ancient 'Mountains of the Moon' and the true source of the Nile. Sketches made by Speke and Stanley – drawn from nearly a hundred kilometres away – were later presented as hard evidence, culminating in the 1890 Anglo-German Border Agreement.¹⁷ This agreement coincided with a revision of the astronomical border to enclose the area within Britain's colonial territory. However, in 1899, German cartographer Captain Robert von Beringe discovered that Mufumbiro was not a single peak but a chain of eight mountains.¹⁸ This revelation prompted intense disputes, exposing the arbitrariness of the astronomical borders and leading all three empires to intensify mapping efforts to anchor claims to verifiable landmarks. As the full extent of the mountain range was charted, border negotiations continued, including a dispute over its name.¹⁹ Germany favoured the name 'Virunga,' whereas Britain insisted on 'Mufumbiro,' used by northern communities to describe a broader cultural and geological landscape.²⁰ The boundary commission ultimately sided with the British, citing Speke's earlier illustration of a sequence of mountains.²¹ Despite this, I use the name 'Virunga' throughout this essay, as it has become the widely recognised term in both academic and conservation contexts.

The boundary commission eventually formalised the split in 1910, maintaining the border at its mythical astronomical location and dividing the range between British and German colonies. The final border followed the straight astronomical meridian – one degree south – where it intersected with the peaks of the eight Virunga Mountains, partitioning territories. Between 1922 and 1925, the border between the Belgian Congo and British Uganda was redrawn from the peak of Mount Gahinga northwards.

This redrawing transformed the Virunga Mountains and surrounding forest landscapes into a tri-border conservation enclosure, shared between the Belgian Congo, British Uganda and Ruanda-Urundi.²²

American taxidermist-filmmaker Carl Akeley, commissioned by the American Museum of Natural History, travelled to the Virunga to capture specimens of the East African mountain gorilla. In 1923, following his explorations, Akeley produced a map petitioning for the tri-border landscape to be designated as a wildlife sanctuary for the protection and scientific study of the gorillas. His initial maps illustrate a twenty-five square kilometre area, triangulated between the peaks of Mount Karisimbi, Mikeno and Bisoke. Akeley proposed that the sanctuary be bordered by a perimeter road for native police, which he referred to as a 'deadline' – a physical line drawn around a prison – and suggested that it be permanently inhabited and supervised by Europeans.²³ [Fig. 2] In 1925, King Albert of Belgium allocated 10,000 hectares of land, creating the Albert National Park, with Akeley appointed to scientifically verify its borders on the ground.²⁴ In 1926, Akeley returned to Virunga, but died, to be buried within the borders of the new park. In his absence, Belgian zoologist Jean-Marie Derscheid and Mary Akeley (Carl Akeley's widow) continued with the verification of the park borders, producing a geo-botanical map of the entire park. In 1929, the borders of the park expanded into the Congo, increasing by 110,000 hectares, and it expanded again in 1930 into the British colony of Uganda.²⁵

The colonial mappings that simultaneously established the colonial borders and the disposition of the national parks were inherited by Rwanda when it gained independence in 1961 and the country experienced a shift in political and ethnic power from the Tutsi to the Hutu that led to the rapacious expansion of agricultural activity across the country. Having already cleared 10 000 hectares of forest from the park for pyrethrum cultivation, the Belgians' extractive practices continued under Hutu rule for another decade, further eroding the borders originally intended to conserve the forests and gorillas.²⁶ Within the park, the American primatologist Dian Fossey produced hand-drawn maps locating gorilla colonies, tracking their seasonal movement around Mount Bisoke. Fossey's maps attempted to fortify the borders, to conserve gorillas and their forest habitats. The park borders were eventually granted protection with the forests and the gorillas mapped as geographical landmarks of global concern by Unesco in 1979.

Western visions have dominated the history of the Virunga landscape, using maps as tools to assert truth claims, speculation, and myth in the service of establishing borders. These maps, and the borders within them, were vague and never at rest. The colonial powers who drew

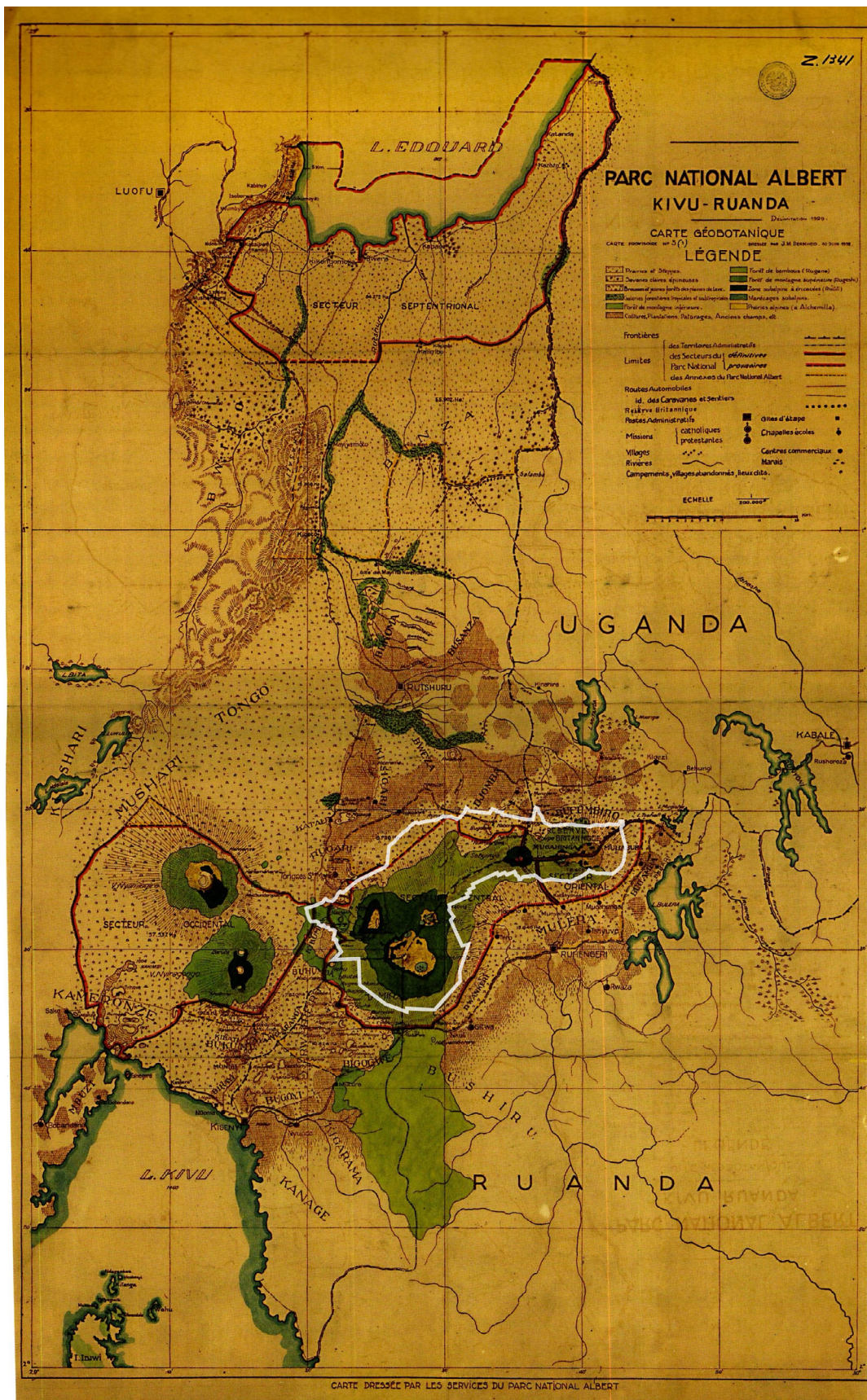


Fig. 2: Akeley-Derscheid's map of the proposed Albert National Park. The present-day tri-border extent has been added by the author.
Source: Royal Belgian Institute of Natural Sciences, 1920.

these borders admitted their ignorance of both the physical geography and non-Western 'traditional' social lines of the landscape.²⁷ The borders that Akeley and Fossey drew reflected their own narrow interests in knowing and conserving the gorilla. Akeley did acknowledge that the Twa were an indigenous group with specific cultural rights to these forests, yet his maps said nothing about them or their dynamic ecological entanglement with the forests. Akeley's maps bordered the forests with deadlines, communicating an anti-ecological, anti-communal, non-relational understanding of nature as isolated and inert.

People – especially the Twa – are absent from these Western maps, which erase non-Western understandings of the Virunga landscape. They depict the land as a uniform, static and dehumanised space, partitioning non-human nature from the social world. These maps are Western approximations that centre European knowledge, while rendering the Twa's cultural claims and lived experiences silent. As J.B Harley notes, such maps 'legitimise the reality of conquest and empire'.²⁸ It is these static representations, their imposed borders and their problematic transformation of the Virunga forests – from a dwelling into a policed enclosure – that the Twa and I sought to map.

Dwelling differences: counter-mapping the forest

Across Rwanda, an excess of borders and boundaries enclose and appropriate common land as state property. Before these borders are enacted as law, they are drawn on paper and communicated as environmental and land-use development plans or maps. These maps impose a governmental power that communicates a Western language, knowledge and ontology of nature – as a finite resource for human consumption – and impose this onto the non-Western, dynamic, lived realities of Virunga. Non-Western people, their land-use practices, understandings and experiences of this landscape are absent from these government maps. Yet, although these maps represent authority, they communicate information in an arbitrary, vague and selective manner.

Graham Huggan, a scholar of post-colonial literature, suggests that cartographic discourse is simultaneously authoritative in its status and approximate in its function. In this discourse, maps are presented as a truth that is 'the subject of a proposition rather than a statement of fact'. Huggan's statement alludes to the agency of counter-mapping in challenging or deconstructing colonial and modern power.²⁹

Maps, methods and positions

The imperial cartographies of the park deprived the Twa of customary rights to hunt and gather resources, a restriction that was sustained by colonial and later ruling

governments.³⁰ By the 1990s, all access to the forests, for purposes other than conservation, was forbidden. Amid the civil war along the Rwanda-Uganda border in 1991, the Ugandan government established Mgahinga National Park, both as a conservation effort and to create a demilitarised zone. The creation of this park led directly to the eviction of thousands of Twa from the forests, forcing them to survive along the park's edge.³¹ In 2011, an indigenous NGO, the United Organisation for Batwa Development in Uganda, provided the Twa in Uganda with an opportunity to narrate their experiences of displacement by recording their cultural understandings of the forest landscape onto a three-dimensional counter-map – a collective mapping practice that places community knowledge at the centre and challenges the legitimacy of official political authority.³² Many Rwandan Twa have extended family across the border in Uganda, maintaining relations. These cross-border relations – both familial and cultural – are embedded in the ways the Twa understand and interact with the forest. However, the knowledge and experiences mapped onto the landscape model in Uganda were not communicated with the Twa in Rwanda, as the country's ethno-politics obstructed such exchanges.

There are twenty-four government-recognised resettlements along the edge of the park, intended to rehouse the indigenous Twa, who historically enter the Virunga forests to gather food and resources.³³ The government frames these resettlements as necessary for integration into modern Rwandan society, often via partnerships between local government, NGOs and religious institutions.³⁴ My initial role in 2013, participating with a German organisation, was to produce an architectural opinion to improve the housing and facilitate this integration. In development contexts, experts are often government officials or *mzungus* – a Bantu term for foreign, white, wealthy individuals. I first met the Twa travelling as this 'expert *mzungu*' in a white SUV, accompanied by a non-Twa entourage including interpreters, a social worker and a local nun.

Access to the Twa was tightly controlled by local authorities, NGOs and religious institutions. Initial meetings were often supervised by non-Twa representatives who steered discussions toward architectural solutions and away from structural inequalities of land and ethnicity. Open discussion of development politics in contemporary Rwanda is virtually impossible, as criticism of government policies on citizenship and ethnicity invite repercussions.³⁵ As a marginalised minority, the Twa are intimidated by these power structures.³⁶ Following a series of pre-engagements, it became clear that substantive dialogue was being obstructed: those who claimed to represent the Twa often echoed broader societal narratives, repeating government positions and thereby perpetuating discrimination.

It was only through chance encounters with a few Twa individuals, away from these intermediaries, that alternative perspectives on resettlement began to emerge.

Counter-mapping offers vital ways to reveal socio-ecological relations absent from official cartographies.³⁷ Yet, mapping relational ontologies builds on and departs from this practice. Where counter-mapping has been crucial for enabling marginalised groups to inscribe their claims and make the invisible visible, such maps risk becoming static artefacts, fixing complex relations into bounded forms and rendering living practices inert. Mapping relational ontologies, by contrast, is not simply an oppositional tool, but a co-produced mapping practice animated by dialogue. It reveals both the Twa's socio-ecological relations with the forest, and the asymmetries between researcher and community, staging new, if uneven, forms of dialogue. By focusing on the relational process itself, mapping relational ontologies cuts across traditional divides of nature/culture and land/people, ensuring the mapping remains dynamic, incomplete and ethically reciprocal.

Engaging meaningfully with the Twa required navigating language and cultural barriers and the constraints imposed by authoritative representatives. I remained acutely aware of my own positionality – a Western, white, middle-class, European, male – and of my inability to fully grasp the experience of displacement and dispossession. As an architect, my lexicon is centred on space and materiality, and my professional practice involves remaking the built environment. This contrasts sharply with the Twa, who are an egalitarian, semi-nomadic people; they do not design or construct permanent houses. My knowledge was limited regarding their former ecological and cultural practices as skilled foragers, beekeepers, animal trackers and healers. I was conscious of ethical critiques, particularly Edward Said's warning against instrumentalising the experiences of the oppressed and Kai Vöckler's concept of 'donor speak', a language structured to align with political and donor objectives.³⁸

Drawing on the work of Richie Howitt and Emmanuel Lévinas, I approached engagement as entering an 'inter-subjective space', an ethical realm mediated through face-to-face encounters and mutual recognition.³⁹ This framework meant that mapping relational ontologies became a method to communicate with the Twa in reciprocal and ethically grounded ways, rather than relying on performative or extractive methods. These mappings also allowed me to acknowledge my own position – geographically distant and culturally estranged – while accepting the limits of my understanding.

In 2016, I returned to Rwanda to conduct a mapping workshop focused on the cultural rights value of forests, extending dialogues across the Rwanda-Uganda border.

A small group of six community members participated, using the participatory principles of free, prior and informed consent (FPIC). I maintained transparency, openly acknowledging that the research was continually evolving and that outcomes were not predetermined. Crucially, participants were never prompted to discuss the Rwandan genocide or their ethnic identity; such topics emerged only incidentally and voluntarily. Given the limited availability of conventional tools, exercises were adapted to use locally accessible materials, such as pebbles, sticks and sand.

Over several days, this select group of Twa community members – Patrice, Uwineza, Mwamini, Chance, Emmanuel and Joy – first narrated and mapped their dreams (their former semi-nomadic life within the forests) onto a three-dimensional landscape model. On the second day, at the foot of Mount Mufumbiro (Muhubura, 'the guide'), they mapped their nightmares – their experiences of resettlement – onto a two-dimensional map depicting the mountain itself: physically nearby, yet present only to view and memory.⁴⁰

Dreams

The group assembled in Uwineza and Patrice's living room, with a landscape model – the three-dimensional base for our counter-maps. Through my interpreter, I explained that we would record their sites of cultural importance using annotated, coloured pieces of paper. I addressed the group by asking where they had previously lived within the forests. Patrice, the oldest male and self-appointed spokesperson, was the first to come forward. He pointed to the foot of Mount Muhubura within the forests and described the location of a large tree where he and his family of six had lived until the late 1980s. The tree, he said, provided them with an elevated shelter for sleeping and for keeping foraged goods out of reach of wildlife. His clan, he indicated on the model, had lived in the forests between Mount Muhubura and Mount Sabinyo. He then located two other clans nearby, called Rubrika and Kavuzza, to the east, between Mount Sabinyo and Mount Gahinga. Patrice's accounts correspond with the anthropological understanding that forest communities tend to be small and share the forests with other, neighbouring clans.⁴¹

Patrice said that his family had lived in and under this tree before moving to a hidden cave he called Kaguriro, which he found within the escarpment of Mount Muhubura. This cave, he said, provided his clan with shelter from the weather, animals and government guards who patrolled the park. Numerous caves exist across the Virunga Mountain range, having been formed by warm pockets of gas trapped within cooling lava several millennia ago. Caves are polyvalent spaces. They provide the Twa with

shelter but are also spaces of ritual and celebration. In addition, dark caves are habitats for stingless honeybees that produce wild honey.⁴²

When prompted about how they sourced food within the forest, Patrice listed a variety of animals they hunted across different locations and at different times of the year. Animals were hunted for both wild meat and their skins, which were used as raw materials for crafting goods. The Twa used local trees and plants, such as eucalyptus and bamboo, to make devices for hunting, carrying water, cooking and eating. Patrice described how they used bamboo to skin animals and remove their flesh, which was then wrapped in leaves and buried in a hole for cooking. On top of this, they would make a fire that would burn for several hours before the meat was removed and eaten by the group. According to Patrice, animal skins were used to create pelts and containers for his clan, while also functioning as trade goods exchanged with non-Twa communities for crops.

Using the model, Patrice mapped his hunting locations near sources of water where the buffalo (*imbogo*), antelope (*ifumberi*) and elephants (*inzovu*) drank. Patrice signalled on the model their main source of water in the ravine on the steep, southern face of Muhubura Mountain, which he called *Agacuri Ibuhoro*.⁴³ Patrice returned to the model to discuss the sourcing of wild honey. The hives of stingless bees, he explained using words and gestures, are removed from a tree or cave and placed on the ground next to a smoking fire to pacify the bees and allow the Twa to extract the honey. Wild honey that is not consumed immediately is kept and fermented to make mead or applied to the skin as a topical medicine. Honey, for the Twa, is a culturally valuable forest resource used within ritual dowries or exchanges with other communities for crops or dairy products.⁴⁴ Social transactions outside of the forest, between the Twa and other ethnic groups, Patrice informed us, were determined by the availability of forest resources for exchange – resources whose presence is shaped by seasonal and weather conditions. Rwanda has two wet seasons, one of which is longer and colder. The wet season from January to April is much colder than from October to mid-December. For the remainder of the year, from May to October, Rwanda is dry and hot. These wet periods and intervals make up the Twa's ecolendar of three seasons: one of hunger in the forest called *urugandyi*; one of hunger outside the forest called *amapfa*; and the season of common abundance across the landscape known as *izuba*.

During *urugandyi*, Patrice said, the forests are colder and wetter, a period when animals hibernated or migrated, and when he and his group hunted for smaller animals or foraged for medicinal plants along the forests. He said

they often looked for a plant called *umuhanga* that they consumed and that relieved stomach cramps and cramping during childbirth. Patrice mapped the locations of this foraging for the *umuhanga* plant along the edges of the park and riverbanks. The hot and dry season of *amapfa* in June and July is when the forests are full. Patrice told us, however, that it is the opposite for the farming communities whose land and households suffer from drought. Patrice described how, during this period, he and the Twa walked on foot to fetch water from a spring located on the banks of Lake Ruhondo, which he carried back to Gahunga for reselling.

Patrice's accounts are consistent with those of the Twa in Uganda, where the forest people experience time differently from the Gregorian calendar. Rather, for the Twa, forest time is defined by spatiotemporal experiences of sourcing food and episodic interactions with outside communities.⁴⁵ Patrice continued to map an intensely localised understanding of the landscape on the model, characterised by the actions of movement and gathering resources across varying locations. A tree, for Patrice, was simultaneously a source of food, a medicinal plant, raw material for craft and a place for safe storage.⁴⁶ Patrice's counter-mapping began to reveal a borderless forest dwelling, one that paid little attention to the fixed boundaries of the park. The dwelling spanned thirty square kilometres of the Virunga forest landscape, as scaled from our model. By comparison, his new modern house covered only forty square metres. As we reflected on these disparities, the rain began to fall heavily, hammering on the corrugated metal roof above, signalling the arrival of the first wet season of the year. The sound of the rain silenced our conversations, deferring our dreamings for the day. In that pause, however, the presence of the rain evoked enchantment – a reminder of dwelling as something more expansive, interlacing human life with forest, season and atmosphere.

Nightmares

Following the previous day's rain, the communal ground at the Twa settlement had dried. We gathered on an elevated plateau at its centre, its surface scattered with circular outcroppings of volcanic stone. Patrice, Emmanuel, Uwineza and Mwamini perched on the volcanic rocks. Chance sat on a wooden bench next to Joy. I laid a detailed printed map of the Virunga area that I had prepared in the middle of the group. I began by asking about the forest evictions at the onset of the Rwandan civil war. Pointing to the map, Patrice described being displaced from a small shelter he and his family had built from foraged bamboo stalks and eucalyptus branches, along the park and forest's borders. He explained that this shelter's location provided his family

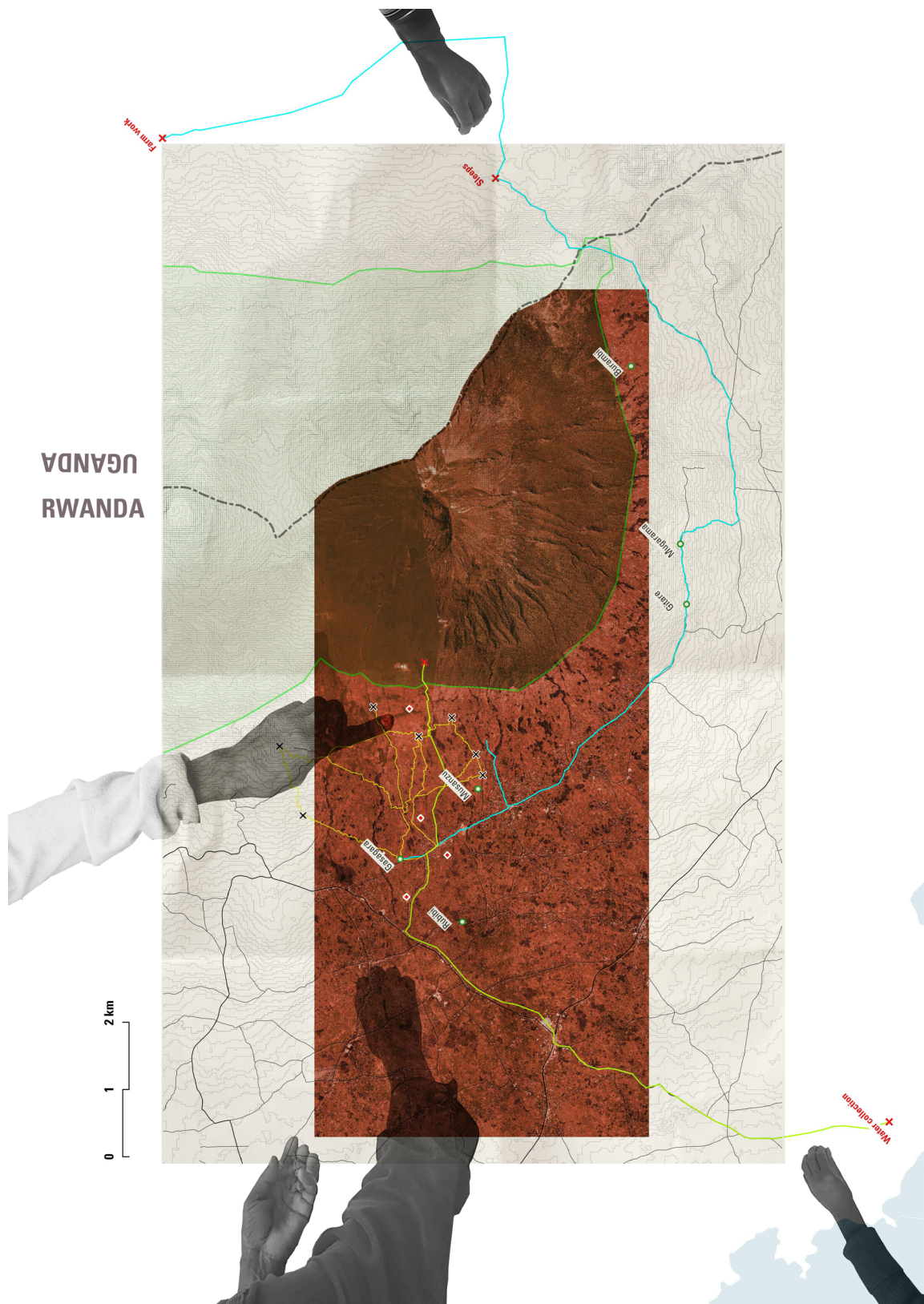


Fig. 3: Mapping dwelling differences in the Virunga forest landscapes. The red aerial overlay marks the survey zone in Rwanda, ending at the 1910 colonial border, while yellow paths and blue streams trace cross-border routes towards Uganda. Produced collaboratively with members of the Gahunga Twa community, who charted seasonal journeys and dwelling practices by placing stones directly onto the map. Composite image: Gahunga Twa community and Killian O'Dochartaigh, 2023.

with a view of the forest's edges, allowing them to seize the right moment to re-enter undetected and forage. Patrice recounted how this practice continued until he was caught by authorities, who demolished their shelter and pushed them further downhill, toward the nearest village. Patrice's hand traced a path of displacements on the map, showing how each time they rebuilt their shelter on someone else's farmland, the authorities would soon arrive to destroy it again, forcing them to move once more. During this period, they lived a semi-nomadic existence, but not out of choice. This continued until they were forced one last time to settle permanently in 2010, which was also the year of the government's campaign outlawing the construction of thatched roof housing.⁴⁷

Following this, I asked the group about sites of cultural importance close to their present settlement. Uwineza said firmly that the most important places are where food is found. Or rather, that food is the most important place. Cultivated rain-fed crops such as potatoes (*ibirayi*), maize (*igikori*) and beans (*igishyimbo*) thrive in the Virunga landscapes, due to the combination of acidic volcanic soils and the wet, high-altitude climates. Whereas potatoes are a perennial crop, maize and beans are seasonal, cultivated and harvested twice a year. Uwineza's hand danced over the map, identifying food sources within a mosaic of crop fields.

Patrice edged forward, elaborating that as the Twa do not possess farmland or farming knowledge, it is difficult to feed and support their families. As a result, many of the Twa rely on foraging for surplus crops or undertaking menial labour for the non-Twa outside their settlement. He then pointed to the map, locating a potato distribution centre about two kilometres east of the resettlement. Patrice explained that he walks there daily in search of work as a day porter, carrying sacks of newly harvested potatoes from the fields to the centre. For a day's work, he earns between 400 and 1 000 Rwandan francs (roughly 26 to 66 British pence). During the dry season, when the fields are less active, Patrice said he shifts to fetching water from a spring on the edges of Lake Ruhondo, which he carries to the nearby town market to sell. For this ten-kilometre round trip, carrying two twenty-litre jerry cans of water, Patrice earns 800 Rwandan francs (about 66 pence).

Chance approached the map to describe how she leaves the resettlement each February, when food is scarce during the fallow period, journeying on foot and crossing the border with Uganda unseen. Carrying her child – strapped to her back – and a hoe (*isuka*), she traces a route north-eastwards from the clustered dwellings of Gasagara, following the blue footpaths shown on the map as they skirt the base of Mount Muhabura towards the most direct crossing into Uganda, avoiding both the prohibited

forest and the formal border checkpoint further downhill. [Fig. 3] Her path continues beyond the red aerial overlay of our survey zone in Rwanda, which stops at the 1910 border, towards the settlements marked on the far side of the Virunga forest. She charts this twenty-five-kilometre walk by placing small stones on the ground, extending beyond the limits of our mapped frame, to reach her extended family village, where, she claims, the land is more fertile. Food security for most Rwandan households depends heavily on rain-fed crops. The threat of marketisation and climate change is undermining farming livelihoods and overall food security. As the Twa are not granted equal rights to farmland or employment, they must often travel further than other ethnic groups in search of food and labour.⁴⁸ As the last recipients of land or employment, 40 per cent of the Twa in Rwanda rely on begging to survive.⁴⁹

Emmanuel now came forward and placed a stone on the map, representing a nearby location representing his farmland on which he cultivated bananas. He then placed a second stone representing a plot of farmland where he grew wheat and potatoes. A third stone was placed for a field of sorghum and beans. Emmanuel then traced his finger along the map, representing his weekly commute from these fields to the local market where he purchased seeds and sold surplus crops. Joy followed by picking up a stone to mark her plot of land on the map situated right behind us. The Twa do not customarily own farmland or private property. Their claims to land were erased long ago.⁵⁰ That Emmanuel and Joy mapped their ownership of multiple plots of farmland may indicate that they are, perhaps, not Twa at all, but were sent here to observe and record on behalf of others. Emmanuel and Joy's mappings revealed other borders that communicated ethnic privilege and difference. However, I could not ask about these differences as discussing ethnic identity in Rwanda is a taboo subject, a border that you do not explicitly cross.⁵¹

Before the counter-mapping session concluded, I asked the group about other places or buildings they value and visit. They highlighted the older colonial institutions – the hospital, the school, and the church – as places where they literally perform traditional dances for the public, while simultaneously performing socially, showing obedience and willingness to suppress their indigenous practices.⁵² Uwineza noted that the market town downhill is of value, as it is a place where meat can be purchased and where the men can socialise. The town is a place of indulgence for the Twa, a place to escape. I turned to Patrice, the patriarch of the group and asked, 'What do you do, there, in town?' He smiled, replying, 'We drink and dream of the forests'.⁵³

These counter-maps reveal radically different perceptions of dwelling in the forest: as resettled, as



Fig. 4: Still from the animated counter-map Mufumbiro using counter-mapping data of the Gahunga Twa community. Animation by Kilian O'Dochartaigh, with assistance from Jason Men, 2021.

metaphysically borderless or materially enclosed. They also touch the less distinct borders of class and ethnicity that delineate the Twa's migratory and marginal existence. Here disenchantment comes to the surface: the disappointment of modernity in the form of housing that promises belonging yet enforces exclusion, and of 'development' that encloses and silences the Twa's ongoing claims to the forest. Despite living in a house (a bordered space) like other Rwandans, the Twa are still not treated equally. In the following section, I will explore these differences in dwelling and mapping, using digital technologies to make them more visible, and to animate, through the movement of the map, the Twa's dynamic and egalitarian claims.

Re-animating: from static GIS to moving counter-maps

Over two days, the Twa narrated and mapped their dwellings, first depicting the forest as spaces of movement, livelihood and deep relations with non-human life and then describing their resettled lives, marked by displacements in search of food and work. The Twa remain semi-nomadic, their movements shaped by deep-seated prejudices that limit their access to land, employment and opportunities. Yet, the physical maps we co-produced remained inactive, silent and stored away. They failed to fully capture the depth of the Twa's dynamic movements and their broader territorial claims.

After returning to Europe, I began digitally recording the Twa's counter-maps using drafting and mapping software. If their counter-maps and revisions of borders were to be taken seriously, it was crucial to leverage the technical tools of my privilege to create a precise, scaled map of their narratives. Over a two-week period, I layered the Twa's geographical claims and the corresponding claims mapped by the Twa in Uganda in 2011 alongside official data sets, including topography, forestry, governmental borders and gorilla colonies.⁵⁴ Each Twa claim was re-inputted as a data point into GIS, automatically generating a unique coordinate in the global positioning system (GPS) also used by the government. Into this metadata, I encoded the site's name, its resource value and the time of year it was accessed, alongside the locations of forced, unmapped resettlement sites outside the forest.

However, even when all the data points had been inputted onto the counter-map, it did not yet communicate the spatiotemporal relations between the forest site and the Twas' movement, the topography, the weather patterns and the social interactions with other communities. To make the counter-map more active, I connected these isolated data points as relational pathways. I used high-resolution aerial photos to identify traces of established desire lines through the forest or along rivers and streams – paths showing habitual use, such as shortcuts

to natural resources, connections between clans, and vantage points. This synthetic data was then cross-referenced onto the Twa's ecolendar, collapsing their spatial understanding of the forest with their understanding of time as defined by intervals of hunger and abundance into one cosmological counter-map. To ensure credibility, this first digital counter-map co-opted the government's own cartographic language, layout, fonts and indexing to communicate the Twa's claims convincingly.

Once complete, this static digital map still failed to narrate the semi-nomadic, troubled lifeworlds of the Twa. It suffered from the same limitations as architectural drawings, emerging from a Euclidean two-dimensional geometry that insufficiently communicates a dynamic, impermanent and interconnected understanding of socio-ecological space. Maps created in this geometry often serve to specify what border or wall is to be built where.⁵⁵ To move beyond this fixed representation, I turned to anthropologist Timothy Ingold's suggestion of 'anthropography', the practice of drawing correspondences with the world.⁵⁶ I returned to the static counter-map on my computer screen, exporting it and re-layering it into video software with the aim of animating it. The lines between sites were programmed to move at a given speed and intervals. The ecolendar was synchronised to revolve along with the Twa's lines of movement, which were overlaid onto a static image of the landscape model made a year earlier.

This new version of the counter-map animates the Twa's perambulatory movement and collective claims in the Virunga forests – a claim measuring 125 km². [Fig. 4] The dense white tracings of paths across the map record how space here is understood as topological and relational. Movement is traced not as linear distances but in relation to sites of cultural and resource value – marked on the map as nodes such as burials, hot springs, bamboo groves, weaving sites and water points. These informal paths weave across topographical and hydrological features – mountains, rivers, creeks and swamps – shown faintly in the background cartography. The constellation of points and lines conveys how the Twa's existence intersects with that of mountain gorilla, buffalo and duiker, all within the same habitats. Read together, these tracings assert dwelling not as residing in a fixed place, but as a continuous relational habitat, a meshwork of paths and sites inscribed with social knowledge of the landscape.⁵⁷

The reanimated counter-map extends this logic, showing dwelling as a fluid network of connections that upholds the Twa's claims predating the 1910 colonial border. It demonstrates how the Twa see human and non-human worlds as dynamically co-existent, irrespective of the static borders that underwrite conservation and settlement. As such, the reanimated counter-map is called 'Mufumbiro',

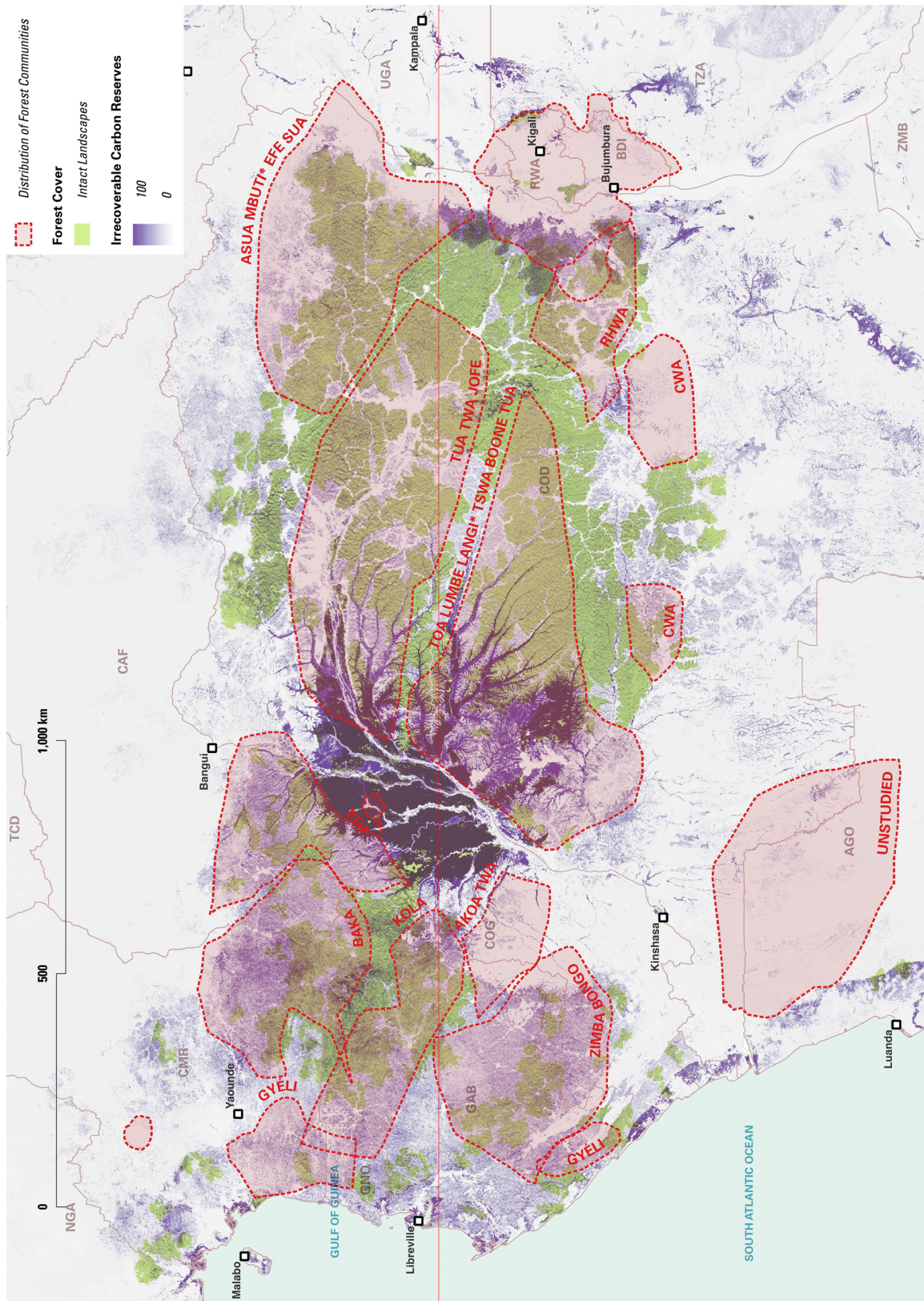


Fig. 5: Central African forest communities, Rwanda in red. Adapted from Bahuchet (1986) by Killian O'Dochartaigh; data from Intact Forest Landscapes (2016) and Global Forest Watch, Hansen (2013).

invoking the Twa's indigenous, geographically expansive and ecologically inclusive understanding of Rwanda's landscapes, while simultaneously using the technical process of animation to challenge static epistemologies of home.

Counter-mapping and relational ontologies

Rundstrom argues that different cultural experiences and knowledges of a place – specifically between intimate, lived understandings (indigenous) and distant, Eurocentric perspectives – are reflected in how maps are made, what they communicate and how they are used.⁵⁸ He suggests that text-based Western cultures value recording knowledge long after experiencing a place. Western maps, therefore, represent place in measurable, permanent data, communicating a spatially enclosed, empty and static understanding that fails to convey ecologically relational knowledge.⁵⁹ By comparison, non-Western cultures, such as the Twa, prioritise oral traditions and bodily actions (storytelling, dancing, performance) to converse about a place. The communal action of documenting place is often more important than the completion of the map artefact itself. The difference lies in the value placed on the process: for non-Western cultures, bodily engagement with their surroundings is intrinsic to map-making; for Western cultures, value is placed on creating a precise, conclusive map to assert ownership. Rundstrom illustrates this by describing how, in the nineteenth century, British explorers hired indigenous Inuit hunters as cartographers.⁶⁰ Drawing from deep knowledge, the Inuit created precise maps quickly and instinctively, often tracing them in the snow, sand or air. These embodied maps reflected the Inuit's daily practices and their social-ecological relationship with their environment, communicating a worldview where humans and non-humans coexist.

Similarly, the Twa did not only map their knowledge of the landscape from memory, but also performed it. For instance, Patrice mapped a water source called *Agacuri Ibihoro* ('a slope that is slow'), embodying the difficulty of sourcing and carrying water, as he described it. This performance links to the concept of topogeny, coined by James Fox, which describes the generational transfer of place names used to organise and convey social knowledge of, and relations with the landscape.⁶¹ The final re-animated counter-map was an iterative process spanning two years and involving multiple hands, geographical locations and time zones. This map originated in Rwanda in 2015 when the Twa first outlined their histories on the ground, which was then translated into a landscape model in London. The counter-map re-emerged in Rwanda in 2016, using the model and two-dimensional drawing. These counter-maps then returned to my apartment in London, where they were slowly layered onto a screen.

From a position of geographical distance and privilege, the Twa's lines of movement and livelihood were envisioned, speculated upon and extrapolated from aerial photos of the Virunga forests and my own field photographs. In 2017, the final counter-map was exported and processed using video-editing software to make it move, demonstrating the transformation of static data into a dynamic representation.

This re-animated counter-map, continually performing in a loop and accessible online, has not been committed to the stillness of paper. It has been designed to remain open to addition and change, as it must, given the Twa have yet to see its final form. It remains incomplete – an ongoing process of exchange and a shared dream between the Twa and me.

Visions: reframing 'home'

The colonial and governmental maps of the Virunga are concerned with drawing border lines that represent and aid in taking control and commodifying the landscape. These maps underwrite the universal, Western understanding of nature as uninhabitable and uninhabited and define the architectural epistemology of a house as a static, bordered and distinctly private space. The lines on the Twa's counter-map, however, represent lines of life, of movement and a relational and temporal way of living in the landscape and with time. Cutting across boundaries, scales, space and time, they are at once transcalar and transectional.

The Kinyarwanda word *urugo* has several interconnected meanings. It can be translated as home, but also holds the social connotation of family, and is used to describe a physical barrier such as a fence. In pre-colonial Rwanda, this was also the measure of an individual and ethnicity's diligence, where the *urugo* was the result of hard labour clearing the forest and preparing the land for farming.⁶²

In Rwanda, the average family size is 4.3 people, who together require a minimum of 0.75 hectares of farmland to meet basic nutritional needs.⁶³ The average plot of farmland owned by families has decreased since the 1960s, from two hectares to 0.5 hectares.⁶⁴ The area of land allocated to the Twa for resettlement measures 0.7 hectares, accommodating eight families.⁶⁵ Joy and Emmanuel, who own six scattered plots of farming land across the district, represent a privileged group, as they are not Twa and do not share the same experiences or beliefs.

To the Twa, the meaning of family extends far beyond the traditional nuclear family. The Twa belong to a much larger relational network of forest communities, spread across the 1.5 million square kilometres of intact equatorial forests within the Congo Basin (Rwanda to Cameroon), occupied by an estimated 300 000 to 900 000 hunter-gatherers. [Fig. 5] For the egalitarian Twa with their forest families,

relational ways of being cannot be delimited by the enclosures of the house, the borders of a forest, or a map. Mapping relational ontologies foregrounds their expansive, egalitarian ways of being.

Conclusion

Western maps create a static and externalised picture of the world, and reflect home as a bounded, private space severed from the natural world. Such maps cannot hold indigenous concepts of dwelling that are active, spatiotemporal and embedded within the landscape. As Doreen Massey reminds us, cartographic power lies in a map's ability to erase complexity, rendering space tame and silent.⁶⁶ This is nowhere more evident than in Africa, where 80 per cent of borders follow colonial astronomical lines, instruments of power that severed social and cultural relations. The Rwanda–DRC boundary remains one of the most divided and unsettled in the world today.⁶⁷

Relational as they are, the egalitarian Twa and their forest families have been enclosed by domestic, forest, and governmental borders. Their resettlement severs deep connections to land and mobility. The counter-maps we produced are not simply oppositional artefacts; they are part of an intercultural dialogue, questioning the legitimacy of static visions while indirectly challenging the Universal Declaration of Human Rights, where 'adequate housing' does not include the right to land.⁶⁸

It is here that the concept of mapping relational ontologies matters. While counter-mapping gives marginalised groups voice, such maps often remain static, politically alive yet ontologically 'dead'. Mapping relational ontologies goes further by treating mapping as an animated and animating process. It is a co-production: for the Twa, mapping is embodied performance – gesture, toponym, narrative – while for me, it is architectural drawing and digital mediation. What emerges are hybrid relational ontologies that reveal both the divisions imposed by conservation cartographies and the new divisions that surface in the collaborative encounter. Mapping relational ontologies is a transversal practice that reanimates erased relations, staging a process – rather than a finished product – that opens space for new, if uneven, forms of dialogue between people, land and power.

Reinstating the Twa within the landscape and animating challenges to Virunga's static, extractive conservation model happens through the repeated telling and re-telling of the Twa's struggle. This process begins by entering their space, walking with them, speaking with them and making maps together. In alliance with Ananya Roy's 'politics of location', these maps themselves speak, animating more complex understandings of the world attuned to the rhythms of semi-nomadic life.⁶⁹ They also

provoke reflection about architectural practice: why build without considering existing socio-ecological relations? For whom are we building, and is building necessary at all? Choosing not to build can be an act of recognition.

The Twa in Rwanda have not yet seen these maps. Moving forward, my intention is to return with the maps – again, not to Rwanda, where political space is restricted, but across the nearby border to Kisoro, Uganda. There, the Twa have established civil and political representation in a more tolerant context. Bringing this research back will involve translating the maps into the Twa's own language – Kinyarwanda – while also encoding them in a visual, landscape-based language that conveys relational and toponymic knowledge, in order to overcome barriers of communication and access. In its capacity to reintroduce wonder and recognition into landscapes scarred by displacement, mapping relational ontologies is not only a method of critique but a vehicle for re-engagement. In their animation lies a certain enchantment: they do not simply document loss, but reanimate the presence of forests, kin and practices thought erased. It is this affective charge of seeing relations come alive that makes mapping relational ontologies a powerful practice for staging new forms of dialogue in one of the world's most divided borderlands.

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Notes

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1. Athan Tashobya, 'Conservation Body Donates Land to Volcanoes Park to Expand Habitat for Gorillas', *The New Times*, 10 January 2018.
2. Ibid.
3. *Vision 2050* (formerly *Vision 2020*) seeks to socially, economically and spatially urbanise a predominantly rural, agrarian society. Republic of Rwanda, *Vision 2050* (December 2020).
4. Hannah Nielsen and Anna Spencley, 'The Success of Tourism in Rwanda – Gorillas and More: Background Paper for the African Success Stories Study', *World Development Report 2011* (Washington DC, 2010), 3.
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9. For initial observations in Rwanda and early engagements with the Twa community, see Killian Doherty, 'Territories of Practice: Kimisagara Community Center, Rwanda,' *MasContext* (2013); Killian Doherty, 'Re-Making the City,' *Cityscape*, no. 3 (2013): 30–31; and Killian Doherty, 'Indigenous Perspectives: the Post-Conflict Landscapes of Rwanda,' *Footprint* 19 (2017): 151–55, <https://journals.open.tudelft.nl/footprint/article/view/1435>.
10. Studies of the colonial transformation of the Virunga landscapes into national parks highlight the enduring consequences of these enclosures. See *Virunga: Archives and Collections of an Outstanding National Park*, ed. Patricia Van Schuylenbergh and Han de Koeijer (Tervuren: Royal Museum for Central Africa, 2017); Gillian Mathys, 'People on the Move: Frontiers, Borders, Mobility and History in the Lake Kivu Region, Nineteenth–Twentieth Centuries' (PhD diss., Ghent University, 2014); and Killian O'Dochartaigh, 'Frame, Fortress, Fenestration: The Architectural 'Enframings' of Rwanda's Forests, 1904–2022', *Architectural Theory Review* 29, no. 2 (2025): 231–54. While these studies address the wider Virunga-Ruwenzori-Kivu borderlands, this article focuses on the 1910 Anglo-German border that delineated Rwanda and shaped subsequent conservation and ethnic relations.
11. Mappings and conversations with community participants were documented during fieldwork in Rwanda in 2015 and 2016. All participant names have been anonymised to protect their identities.
12. On the notion of 'fantasy', see Vanessa Watson, 'African Urban Fantasies: Dreams or Nightmares?' *Environment and Urbanization* 26, no. 1 (2014): 215–31.
13. The colonial powers included Germany, Belgium, France, Britain, Spain, Italy and Portugal; only Ethiopia and Liberia remained uncolonised.
14. They are: Nyamuragira (3 058m), Nyiragongo (3 470m), Mikeno (4 437m), Karisimbi (4 507m), Bisoke (3 711m) to the west with Sabinyo (3 674m) Mgahinga (3 474m) and Muhubura (4 127m) to the east.
15. Rufumbira, a Kinyarwanda dialect, is spoken by the Bafumbira – Tutsi, Hutu and Twa communities in southwestern Uganda bordering Rwanda and the DRC.
16. German explorer Gustav von Götzen traversed parts of the Virungas in 1894, though Speke had observed the mountains from afar in 1863, predating Götzen's journey.
17. John Hanning Speke, *Journal of the Discovery of the Source of the Nile* (Edinburgh: Cambridge University Press, 2012 [1863]), 214; Henry M. Stanley, *Through the Dark Continent* (London: Sampson Low, Marston, Searle and Rivington, 1878), 465.
18. During this expedition Beringe became the first European to kill a mountain gorilla.
19. William Roger Louis, *Ruanda-Urundi, 1884–1919* (London: Cambridge University Press, 1997), 52.
20. E. M. Jack, 'The Mufumbiro Mountains', *The Geographical Journal* 41, no. 6 (1913): 532–47.
21. Louis, 52.
22. In 1962, Ruanda-Urundi achieved independence, resulting in the formation of two states: Rwanda and Burundi.
23. Mary L. Jobe Akeley and Ethan C. Akeley, *Carl Akeley's Africa* (New York: Dodd, Mead & Co, 1929), 235.
24. Raf De Bont, 'A World Laboratory: Framing and Managing the Albert National Park, Belgian Congo', *Environmental History* 22, no. 3 (2017): 408.
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27. Louis, *Ruanda-Urundi*, 93.
28. John Brian Harley, 'Maps, Knowledge, Power', in *The Iconography of Landscape: Essays on the Symbolic Representation, Design and Use of Past Environments*, ed. Denis E Cosgrove and Stephen Daniels (Cambridge: Cambridge University Press, 1988), 282.

29. Graham Huggan, 'Decolonizing the Map: Post-Colonialism, Post-Structuralism and the Cartographic Connection', *Ariel* 20, no. 4 (1989): 117.
30. Chris Huggins, 'Historical and Contemporary Land Laws and Their Impact on Indigenous Peoples' Land Rights in Rwanda', *Forest People's Programme* (2009).
31. Dorothy Jackson and World Rainforest Movement, 'Rwanda: Dispossessed Twa People Press for Recognition', *World Rainforest Movement Bulletin* 62 (2002): 8–11; Tom Blomley, 'Natural Resource Conflict Management: The Case of Bwindi Impenetrable and Mgahinga Gorilla National Parks, Southwestern Uganda', in *Natural Resource Conflict Management Case Studies: An Analysis of Power, Participation and Protected Areas*, ed. A. Peter Castro and Erik Nielsen (Rome: Food and Agriculture Organization of the United Nations, 2003), 231–50.
32. Forest Peoples Programme, 'Ugandan Batwa Complete 3-D Model of Their Bwindi Forest Ancestral Area,' 7 July 2011, <https://www.forestpeoples.org/publications-resources/news/article/ugandan-batwa-complete-3-d-model-of-their-bwindi-forest-ancestral-area/>; see also J. G. Muchemi and Christopher Kidd, 'Batwa Indigenous Peoples Mapping of Their Ancestral Cultural and Natural Landscape in Bwindi and Mgahinga National Parks: A Participatory 3-Dimensional Modelling (P3DM) Approach' (Nairobi: ERMIS Africa and Forest Peoples Programme, 2011), unpublished report, shared privately with the author.
33. There are thirty-six known Twa resettlements in Musanze-Burera – twenty-four outside the park and eleven around the Rugezi wetlands – based on maps and consultations with local civil society and religious groups.
34. This includes international and local organisations such as the Red Cross, Dian Fossey Gorilla Fund, Concern International, The Albertine Rift Conservation Society and Rural Environment Development Organisation.
35. Andrea Purdeková, 'Even if I Am Not Here, There Are So Many Eyes', *Journal of Modern African Studies* 49, no. 3 (2011): 475–97; Danielle Beswick, 'Democracy, Identity and the Politics of Exclusion in Post-Genocide Rwanda', *Democratization* 18, no. 2 (2011): 490–511.
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49. Huggins, 'Land Rights and the Forest Peoples of Africa', 8.
50. *Ibid.*, 7.
51. Purdeková, *Even if I Am Not Here*, 475–97.
52. For more on the architectural role in mediating both literal and social performativity among the Twa, see O'Dochartaigh, 'Frame, Fortress, Fenestration', 235.
53. Lewis notes that alcoholism is common among the Twa due to the erosion of community solidarity. Lewis, *The Batwa Pygmies*, 24.
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Biography

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