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From "Nazi Cows" to Cosmopolitan "Ecological Engineers": Specifying Rewilding Through a History of Heck Cattle

Jamie Lorimer* and Clemens Driessen†

*School of Geography and the Environment, University of Oxford
†Cultural Geography and Forest and Nature Conservation Policy, Wageningen University

Rewilding has become a hot topic in nature conservation. Ambitious schemes are afoot to rewild continental Europe and North America. Hopes are being invested in the political, economic, and therapeutic potentials of future wilds. Popular and scientific enthusiasms for the wild are frequently ahistorical and apolitical, however. This article begins to address this problem. It offers one genealogy of rewilding, focusing on a history of Heck cattle and their deployment in European rewilding projects. These animals were back-bred by two German zoologists in the 1930s, with Nazi patronage, for release as hunting prey in the annexed territories of Eastern Europe. Some cattle survived the war and their offspring have become prominent, alongside new back-breeding initiatives, in contemporary efforts to rewild a unifying Europe. Cattle now figure as cosmopolitan ecological engineers, whose grazing will create functional, wild landscapes. This genealogy examines what and where is understood to be wild and who is authorized to make such decisions in this story. Drawing cautiously on this extreme example, it examines historic rewilding as a form of reactionary modernism. It critically traces the emergence, persistence, and transformation of various ontologies, geographies, and epistemologies of wildness in Europe to position contemporary rewilding as a mode of ecomodernism. When compared, rewilding under Nazi rule and in the contemporary European Union are found to be different in every relevant problematic respect. Reflecting on differing conceptions of what it means to be modern helps specify a multiplicity of rewildings past and present. The article concludes with a set of criteria for discriminating among rewildings to inform the emergence and analysis of this conservation paradigm. *Key Words: biopolitics, geopolitics, National Socialism, nature conservation, rewilding.*

再荒野化已成为自然保育中炙手可热的主题。再荒野化欧洲大陆与北美的宏大计画正在进行, 人们并对未来荒野的政治、经济与疗癒潜能投以诸多期待。但大众与科学对荒野的热忱, 却经常是去历史与去政治的。本文着手处理此一问题, 提供再荒野化的一个系谱学, 并聚焦海克牛 (heck cattle) 之历史, 及其在欧洲的再荒野化计画中的部署。这些动物是 1930 年代两位德国动物学家回交育种的产物, 并受到纳粹所资助, 用以放养作为在东欧併吞的领土上的猎物。部分的牛隻在战火中倖存, 而其子嗣则随着崭新的回交育种计画, 在当代再荒野化统一的欧洲之努力中颇富盛名。牛隻现在被认为是世界生态的工程师, 而其牧场将能创造具功能性的荒野地景。本系谱学检视此一故事中, 何物及何处被理解为 "荒野", 以及什麼人被授权来进行此般决策。本文谨慎地运用此一极端案例, 检视历史中的再荒野化, 作为反动的现代主义之形式。本文批判性地追溯欧洲对于荒野的各种本体论、地理与认识论的兴起、续存与变迁, 以将当代的再荒野化置放作为生态现代主义的一种模式。相较之下, 纳粹统治下与当代欧盟的再荒野化, 在各个相关的问题意识面向中皆有所不同。反思现代意义为何的差异化概念, 有助于具体说明再荒野化的过去与当下的多重性。本文于结论中提出一组区辨再荒野化的准则, 以告知此一保育模式的浮现与分析。 *关键词: 生命政治, 地缘政治, 国家社会主义, 自然保育, 再荒野化。*

El retorno a lo silvestre [*rewilding*] se ha convertido en un tópico caliente relacionado con la conservación de la naturaleza. Varios diseños ambiciosos para aplicar este tipo de conservación se hallan en marcha en la Europa continental y en América del Norte. Se está invirtiendo esperanza en el potencial político, económico y terapéutico que pueda derivarse de futuros entornos silvestres. Sin embargo, los entusiasmos populares y científicos por la naturaleza silvestre son con frecuencia ahistóricos y apolíticos. Este artículo empieza a ocuparse de este problema. En este escrito se presenta una genealogía del retorno a lo silvestre, centrada en una historia del ganado Heck y su despliegue entre los proyectos europeos al respecto. La recuperación y crianza de estos animales se intentó en los años 1930 por dos zoólogos alemanes, con patrocinio nazi, para usarlos como presas de caza en los campos silvestres de territorios recién anexados en Europa Oriental. Algunos de estos ganados sobrevivieron a la guerra y su descendencia ha llegado a ser prominente, junto con nuevas iniciativas de crianza

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regresiva, en los esfuerzos contemporáneos por recuperar lo silvestre en una Europa unificada. Al ganado se le asigna ahora el papel de ingenieros ecológicos cosmopolitas cuyo pastoreo dará lugar a paisajes silvestres funcionales. Esta genealogía examina qué y dónde está lo que en esta historia debe entenderse como silvestre, y quién está autorizado para tomar decisiones en esta historia. Basándose cautelosamente en este ejemplo extremo, la genealogía examina el retorno a lo silvestre histórico como una forma de modernismo reaccionario. Críticamente traza la aparición, persistencia y transformación de varias ontologías, geografías y epistemologías de lo salvaje o prístino en Europa para posicionar el retorno a lo silvestre como un modo de ecomodernismo. Al comparar el repoblamiento silvestre bajo normas nazis con el retorno a lo silvestre contemporáneo de la Unión Europea se nota que son diferentes en cualquier respecto problemático relevante. Reflexionando sobre las diferentes concepciones de lo que significa ser moderno ayuda a especificar una multiplicidad de retornos a lo silvestre, pasados y presentes. El artículo termina con un conjunto de criterios para discriminar entre los retornos a lo silvestre para informar sobre la aparición y análisis de este paradigma conservacionista. *Palabras clave: biopolítica, geopolítica, Nacional Socialismo, conservación de la naturaleza, retorno a lo silvestre.*

In April 2009, British ecologist and businessman Derek Gow imported a herd of cattle to his farm in Devon in the United Kingdom.[1] He hoped to breed and market these animals as "wild cows," ideal tools for "naturalistic grazing," a form of rewilding that is becoming popular in European nature conservation (Pereira and Navarro 2015). To promote the wildness of his cows, Gow informed a local journalist of their dark history. The subsequent article[2] explained that their ancestors had been back-bred in 1930s Germany by two zoologists—Lutz and Heinz Heck. Working for the National Socialist elite, the brothers sought to recreate the aurochs (the extinct antecedent of domestic cattle) as an icon for the future landscapes of the Third Reich. The story went viral and the subeditors of the British tabloid media had a field day. True to trope, these quickly became "Nazi cows." In an article entitled "The Herd Reich," *The Sun* reported:

> Extinct cattle brought back to life in crazed experiments ordered by Hitler have done what he never could—and invaded ENGLAND. A herd of the mystical aurochs—legendary beasts seen as symbols of Nazi might—was yesterday grazing in Devon. (Coles 2009)

Such parody was accentuated by dramatic cartography showing bovine swastikas sweeping across Europe (Figure 1). A local filmmaker was commissioned by National Geographic TV to make a documentary, including historical reenactment that aired in 2014 with the title *Hitler's Jurassic Monsters* (Bristow 2014). More sincere commentators have voiced anxieties about the purportedly dark provenance of these Heck cattle (as they are now known) and their use as aurochs surrogates in contemporary plans for rewilding Europe (Daszkiewicz and Aikhenbaum 1999; van Vuure 2005; Goderie et al. 2013).

Although farcical, these events brought the histories of this mode of back-breeding and rewilding to popular attention. In this article we take issue with the lazy, insensitive, and sensationalist character of tabloid accounts and offer a nuanced history of Heck cattle, situating them within over a century of enthusiasms for resurrecting the aurochs and rewilding the landscapes they were understood to formerly inhabit. Here we narrate the history of Heck cattle as a contribution to a broader *genealogy* (after Foucault 1977)[3] of rewilding (see Jørgensen 2015). In so doing, we develop criteria for differentiating contemporary Heck cattle back-breeding and rewilding enthusiasts from the activities of Nazi zoologists and their backers. To be clear from the outset, although the histories of Heck cattle make them symbolically charged, their material form and political deployment are not now "Nazi" in character

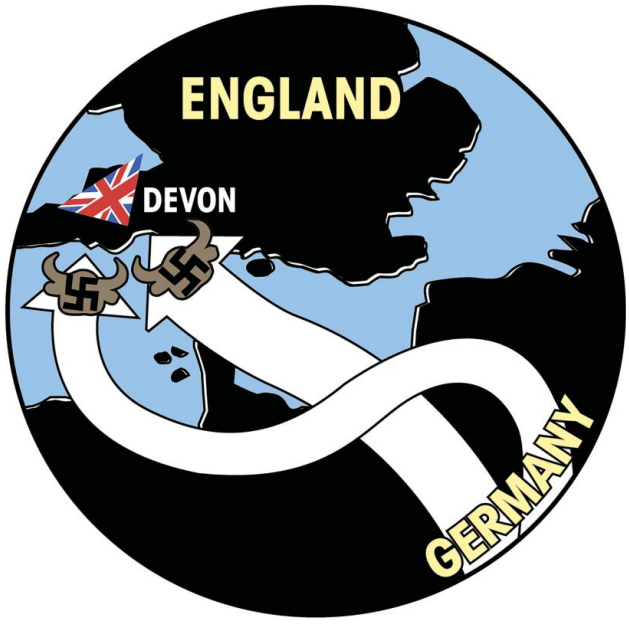

Figure 1. Map from *The Sun*, 22 April 2009. (Color figure available online.)

(and we explain what we understand this term to imply in the analysis that follows). Nor, of course, is rewilding Europe in the twenty-first century a fascist endeavor.

Rewilding is currently a hot topic in nature conservation (Seddon et al. 2014; Lorimer et al. 2015). The term has multiple meanings and enactments, but what these share is a desire to deepen the historic baselines for conservation, to identify the full guild of (often absent or extinct) species necessary for a fully functioning landscape, and then to find means of reintroducing or re-creating missing processes. Continental-scale schemes have been proposed to rewild Europe and North America (Foreman 2004; Rewilding Europe 2012), which show conservationists on the offensive, seeking to channel political and ecological processes—like agricultural intensification, climatic change, environmental regulation and subsidy reform, and urbanization and land abandonment (Ceauşu et al. 2015; Merckx and Pereira 2015)—to enable new forms of ecological restoration. Advocates suggest that rewilding offers a salutory agenda for forging future wildlife-friendly citizens and ecologies, empowering conservationists to "reconnect" disconnected urban publics (Monbiot 2013). The popular manifestos for rewilding, however, are often ahistorical and apolitical and there has been limited research to date on the histories and political ecologies of this most recent round of enthusiasm for a return to the wild (for exceptions, see Hintz 2007; Robbins and Moore 2013).

This genealogy of rewilding through Heck cattle therefore has two broad aims. The first is to account for what and where is understood to be wild and who is authorized to make such decisions. The second is to develop criteria for specifying and differentiating the multiplicity (Mol 2002) of rewildings past and present. The article traces the emergence, persistence, and transformation of various ontologies, geographies, and epistemologies of wildness in Europe. It critically examines how claimed returns to the wild are fundamentally political endeavors with fraught spatial histories. In ways distinct from other forms of conservation, these rewildings mobilize the past to govern the present and to anticipate particular futures. These interventions entangle science and myth, reconciling engineering, bureaucracy, and the technologies of political economy with enchanting appeals to an aesthetic primordial. Projects in the name of the wild shape topologies, affirming and dissolving national borders. They seek to secure populations of human and nonhuman life in the interests of radically different modes of ecologized land management.

Reactionary and Ecomodernisms

We orientate our genealogy of Heck cattle to contribute to two disparate bodies of recent work on Western modernities. The first conceives the geo- and biopolitics of National Socialism as forms of "reactionary modernism" (Herf 1984). Barnes and Minca (2013) explained how:

> On the one hand, National Socialism embraced modernity and instrumental rationality; something found, for example, in the Nazi emphasis on engineering, eugenics, experimental physics, and applied mathematics. They were also exemplified in the Nazi technologies of governance around the economy, population, planning, and settlement. ... On the other hand, cheek-by-jowl was National Socialism's other embrace: a dark anti-modernity, the anti-Enlightenment. Triumphed were tradition, a mythic past, irrational sentiment and emotion, mysticism, and a cultural essentialism that turned easily into dogma, prejudice, and much, much worse. (3)

We bring this concept into conversation with recent accusations by Latour (2007) and others that modern environmentalism is reactionary in its disavowal of anthropogenic ecologies and its adherence to antipolitical and ontologically impossible figures of nature and science (Latour 2004).[4] Latour's criticisms emerge from within a wider and well-established debate that cuts across geography, environmental history, and conservation biology, over the appropriate ontologies and politics for the management of the wild after the "end of Nature" (McKibben 1989). These debates have been energized by recent appeals for an "ecomodernist" (Asafu-Adjaye et al. 2015) mode of conservation better suited to the "novel ecosystems" (Hobbs, Higgs, and Hall 2013) of the Anthropocene.

Ecological modernization is an established concept (Mol 2003) that has been energized and popularized by a recent, optimistic manifesto that imagines a "good" Anthropocene (Asafu-Adjaye et al. 2015, 6). Here "humans" assume their Enlightenment destiny as the "God Species" (Lynas 2011) by using their "growing social, economic, and technological powers to make life better for people, stabilise the climate and protect the natural world" (Asafu-Adjaye et al. 2015, 6). This protection requires significant spatial decoupling (rather than harmonization) of people from Nature through the intensification of human activities and the setting aside (or abandonment) of land for the natural processes that serve human needs. These authors argued that there is "no singular baseline to which nature might be returned"

(Asafu-Adjaye et al. 2015, 26) and what survives, or is created, is a human decision.

This manifesto and the emergence of a new conservation (Kareiva 2014; see also Marris 2011; Blomqvist, Nordhaus, and Shellenberger 2015) has produced a rich, fraught, yet productive debate within and beyond the conservation movement (e.g., Collard, Dempsey, and Sundberg 2014; Wuerthner, Crist, and Butler 2014; Hamilton 2015; Latour 2015). We seek to expand this discussion, developing wider literatures on the geographies and political ecologies of wild(er)ness to formulate a range of criteria for specifying and discriminating among multiple rewildings. We focus in particular on the biopolitical and geopolitical dimensions of our case study. We draw our conception of biopolitics from Foucault (2007) and his seminal writing on biopower as "the set of mechanisms through which the basic biological features of the human species became the object of a political strategy" (1). We engage with recent efforts to apply this theorization to nonhuman life (e.g., Holloway et al. 2009; Lorimer and Driessen 2013; Biermann and Mansfield 2014) to explore biopolitical attempts to both secure and summon forth wildness, which is conceived as a set of systemic properties emergent from and circulating within a social and ecological "milieu" (Foucault 2007, 20; see Massumi 2009; Braun 2014). We focus on the control and promotion of both human and nonhuman life, tracing the interwoven bio- and geopolitical dimensions of different territorialities of wildlife conservation.

Modern tendencies toward the "thanato-politics" (Agamben 1988) of National Socialism have been central to geographers' recent engagements with questions of biopolitics and its spatial or geopolitical dimensions (Giaccaria and Minca 2011; Barnes and Minca 2013; for a review see Rutherford and Rutherford 2013). We draw on this literature but explore how an attention to the specific, vital, and recalcitrant materialities of nonhuman life opens space for a more affirmative approach to the biopolitics of rewilding—when rewilding is not about re-creating a stable, lost wilderness but figures as a process of living with (rather than the control over) human and nonhuman difference (Haraway 2008; Wolfe 2012; Lorimer and Driessen 2013).

The story of Heck cattle offers a compelling, but extreme, example of the different geo- and biopolitics of rewilding. It is illustrative of some of the most interesting intellectual, political, and ecological challenges facing this emerging paradigm. We demonstrate how at a key historical moment in the first half of the twentieth century there was a dark paradox to rewilding, when nonhuman flourishing was predicated on fascist and violent displacement of large sections of the human population. In stark contrast, contemporary rewilders offer a reformist and future-oriented vision of wild cows at the heart of a Wild Europe in which people and nature have been both fundamentally decoupled and (somewhat contradictorily) reconnected. Although we are wary of a genre of critique that tracks all of modernity's paradoxes and abhorrence to the Holocaust (e.g., Bauman 1992), we suggest that there is analytical benefit in understanding Nazi bio- and geopolitics as extremities rather than anomalies to modern modes of environmental governance. We aim to demonstrate how engaging with this extremity in the context of contemporary debates about reactionary and ecomodernisms helps identify a range of conceptual axes for specifying rewildings. These in turn serve to historicize, calibrate, and intervene in what we have elsewhere termed wild experiments for conservation responding to the political and ecological event of the Anthropocene (Lorimer and Driessen 2014).

Heck Cattle and Rewilding in Europe

The following account draws on original archival research into the Heck brothers' activities and publications of the time. Both brothers published avidly in popular zoology journals and other outlets, extensively promoting their zoo work and conservation breeding from the early 1930s onward. Their personal records seem to have been lost,[5] but their published materials offer sufficient insight into their ideas and practices, when read in conjunction with contemporary sources, including Nazi party archives. We supplement this historic material with interviews with contemporary bovine back-breeders and rewilders in Europe and textual analysis of the burgeoning literature on rewilding science, policy, and practice. The article forms part of a larger project on rewilding and more detail on the historical and contemporary dimensions to this story can be found in other publications (Lorimer and Driessen 2013, 2014; Driessen and Lorimer 2016).

The aurochs (*Bos primigenius*) went extinct in 1627 as a result of hunting and competition with its domesticated kin (van Vuure 2005). The Heck brothers began their back-breeding programs in Weimar Germany in the 1920s. Their father, Ludwig Heck, was the famous director of the Berlin Zoo and the boys grew up on the zoo grounds. Lutz succeeded Ludwig in 1932, and Heinz had become the director of the Munich Zoo in 1928. They used the resources and

Figure 2. Photo of Lutz's cattle in Berlin Zoo, taken from the zoo guide of 1940. *Source:* Berlin Zoo.

networks of their institutions to gather desired bovine specimens from across Europe. Their breeding was informed by a range of archaeological, historical, and mythological materials, alongside correspondence with other European scientists, animal breeders, and general enthusiasts. Lutz was a keen hunter and sought out aggressive animals—including fighting cattle sourced from Spain. They claimed success after twelve years of experimentation, creating herds of their "reconstituted aurochs" at their respective zoos (H. Heck 1951; L. Heck 1954; see Figure 2).

By the late 1930s, the brothers had differentially aligned their programs with the diverse constellations of power and political aspirations of the Third Reich. Lutz was a hunting partner of Hermann Goering (whose various positions included that of *Reichsjägermeister* [Reich Hunt Master] and *Reichsforstmeister* [Reich Forest Master]). With Goering's patronage, Lutz was appointed Head of the *Obersten Naturschutzbehörde im Reichsforstamt* (Nature Protection Authority within the Forest Service) in 1938. In Berlin he developed personal and professional relationships with Heinrich Himmler, Konrad Meyer, and others involved in developing and implementing plans for the eastward expansion of the Third Reich.

Lutz imagined an expansive role for his animals in the *Generalplan Ost*, Himmler's genocidal plan for the "restoration" of *Lebensraum* in the territory of central and Eastern Europe conquered from 1939. With Goering's support, Lutz was able to return some of his aurochsen to the occupied Bialowieza forest, which now straddles the border between Poland and Belarus (see map in Figure 3). Here they joined reintroduced bison, bears, lynx, and moose, becoming game for

Figure 3. Map of key sites mentioned in the article.

Goering's private hunting. Heinz seems to have had a more ambiguous relationship with the National Socialist elite (Driessen and Lorimer 2016), but in the early 1940s was commissioned to write a history of the aurochs for Himmler's *Ahnenerbe*.

Lutz's cattle were killed as the war came to its bloody end, but some of the animals bred by Heinz in Munich survived. They languished in a few zoos and enclosures as small semidomesticated herds, where they gained a reputation for being especially hardy, able to withstand cold winters, on poor ground, with little human management.[6]

Naturalistic Grazing Tools

In the 1980s, under very different political circumstances, descendants of these Heck cattle, as they then became known, were imported and introduced into the Oostvaardersplassen (OVP), a polder in The Netherlands. They were again promoted as aurochs surrogates, now incarnated as tools for naturalistic grazing. Here cows (and other herbivores) are encouraged to "dedomesticate," rediscovering wild behaviors for breeding, grazing, fighting, dying, and decomposing (Vera 2009; Smit 2010). The primary aim is to return absent ecological processes to restore prehistorical landscapes, identified by a revisionist environmental history that promotes a shifting mosaic of grazed forest pasture landscapes over the formerly ascendant archetype of the high forest (Vera 2000). The experiment has proved both inconclusive and controversial—fiercely dividing advocates and critics on diverse grounds (Svenning 2002; van den Belt 2004; Lorimer and Driessen 2014).

Nonetheless, the OVP and other Dutch rewilding experiments (Bulkens, Muzaini, and Minca 2015) have helped inspire a continental scale plan for *Rewilding Europe*.[7] Here a network of (largely Western European) nongovernmental organizations and scientists are mobilizing the geopolitical and economic opportunities presented by an expanding European Union to advocate for a dramatic expansion of rewilding through grazing (Merckx and Pereira 2015). Their funding comes from philanthropy alongside grants from the World Wildlife Fund Netherlands and the Dutch and Swedish postcode lotteries (among other sources). Anticipating the continued decline of traditional agriculture and associated land abandonment, they aim to rewild 1 million hectares of European land by 2022 (Rewilding Europe 2012). Wild cattle and horses are in the vanguard here.

Our interviewees made clear that these enthusiasms for grazing are creating a substantial European demand for wild cows. It was this demand that motivated Derek Gow to fund the passage of Heck cattle to the United Kingdom in 2007. Doubts about the authenticity of this breed and anxieties about their aggressive behavior and dark provenance, however, have kick-started new back-breeding initiatives (Goderie et al. 2013). The best established of these is the Tauros Program, who supply cattle to Rewilding Europe. This interdisciplinary team includes (largely Dutch) scientists, animal breeders, and an artist. Their breeding supplements the archaeological and historical evidence available to the Heck brothers with insights gained from contemporary DNA sequencing (e.g., Edwards et al. 2010). This project is gathering momentum thanks to significant funding from Rewilding Europe. Herds of Tauros cattle have been bred and plans are being made for their introduction into areas of southern and Eastern Europe (Rewilding Europe 2012; Goderie et al. 2013).

What Is the Wild?

We begin our genealogy by specifying some of the ontologies that are gathered and performed by the term *wildness* in this story. Here we are interested in what wildness is, when it was understood to be most present, and (in the following section) where one should find it. Imaginations of what wildness is, was, or could be are closely entangled with histories of when and geographies of where (Whatmore and Thorne 1998). We find that wildness is a slippery concept. It means different things to different groups of people, including the range of recognized experts who have taken an interest in back-breeding cattle. Here we get our first sense of wildness as a multiplicity: a "thing that is made by more than one practice" (Hinchliffe 2007, 70). There are at least four ontologies that are enacted in this story, which cut up and perform bovine wildness in terms of its anatomy, genomics, behavior, and ecology.

Anatomy

A common starting place in identifying wild cattle is with visible indicators of animal form that can be readily compared over time. Although the specific evidence that informed the Heck brothers' breeding is poorly recorded, it is clear that in the 1920s and 1930s they toured Europe in pursuit of past representations. Lutz, in particular, spent time visiting prehistoric cave

paintings and gathering copies of images, artworks, and descriptions (allegedly) made of the animals while they were still alive. They added bone and skull gleaned from archaeological collections (H. Heck 1936; L. Heck 1936). They visited "primitive breeds" in the Camargue, Spain, and Corsica to acquire desired specimens. A similar but more extensive collection of prehistorical and historical evidence informed the detailed, artistic visualizations of the animals' form that were produced by the Tauros Program to guide their "schematic breed scheme" for the "aurochs 2.0" (Goderie et al. 2013, 128).

Past and present back-breeders agree that aurochs would have been much larger than contemporary domestic cattle with a far greater degree of sexual dimorphism. They suggest that male animals would have been black with a white eel stripe and large forward-pointing horns. Beyond this, the anatomical evidence is rather inconclusive and the aurochs appear to have been a phenotypically diverse species, varying by geographical region, historical period, and environmental conditions (Felius et al. 2014). Nonetheless, the wild cow aesthetics of contemporary aurochs back-breeding initiatives have been criticized for being determined more by what the modern domestic "turbo-cow" (Orland 2004) is not than by what the aurochs might have been (van Vuure 2005). Here the Belgian Blue or the Holstein Friesian becomes the antithesis of the authentic ur-cow.

Genomics

In the Tauros Program, anatomical features are cross-referenced with a second set of wildness criteria derived from recent technological capabilities to sequence and compare animal genomes. Although genetic ontologies and technologies have a long history in cattle agriculture (Holloway et al. 2009), their use in unraveling domestication is more recent (Church and Regis 2012). The mitochondrial DNA of archaeological aurochs specimens have been sequenced (Edwards et al. 2010) and geneticists have assembled a phylogenetic tree indicating the maternal lineages of bits of the cow genome (Goderie et al. 2013). This genomic map was then compared with similar representations of thirty contemporary breeds, to quantify their historic divergences from a wild ideal and thus to whittle down the breeds to be used. There is an inescapable hermeneutic circle at work here in which anatomical assumptions of what are wild aurochs bones shapes the selection of specimens for sequencing and thence the animals to populate future breeding lines.

The status and use of this genomic information has proved divisive among contemporary back-breeders. For the interdisciplinary Tauros Program, it constitutes one important source for the more holistic field craft of animal breeding (see later). One geneticist explained that the sequenced paleontological material offers a "blueprint" of the old aurochs (Stevens 2010). For the more reductionist advocates at the *Uruz Project*—a splinter movement of the Tauros Program—the genetic evidence offers the transcendent archetype of the authentic animal, enabling lab-based "genome editing" in a deextinction project not dissimilar to those imagined in the book and film *Jurassic Park*.[8] Genetic purity is the principal currency here.

Counterintuitively (at least to the tabloid narrative logics of Nazi genetic experiments), "genetic" purity was less of a concern for the Heck brothers. The science of genetics was in its infancy in the 1930s, but as various historians have noted (e.g., Deichmann 1996), (proto-) genetic understandings came to figure prominently in the genocidal biopolitics of National Socialism. Lutz Heck corresponded with Erwin Baur and Eugen Fischer—the conceptual architects of eugenics—and would have been aware of their arguments of the medical, moral, and political importance of "racial hygiene" to prevent the degeneration they believed to be associated with modern, urban civilization (Baur, Fischer, and Lenz 1923). The brothers did not mobilize these discourses in their accounts of back-breeding, however.

Instead, they believed that the entire *Erbmasse* (hereditary material) of the aurochs survived in contemporary animals. They proposed that the vigorous wild traits of the aurochs would predominate in any breeding activity—contrary to eugenicist anxieties about the weak outbreeding the strong—and thus restoration by recombination could be easily achieved (H. Heck 1936). Heinz wrote gleefully that he had been "crossing all kinds of cattle races in a way that would have horrified a pedigree breeder" (H. Heck 1951, 120). He seems to have reveled in using terms such as *Mischling* (mixed-race) and *Bastard* to describe his aurochs.[9] These were loaded words in 1930s Germany, due to their centrality in Hitler's (1925) *Mein Kampf*. Framed this way, the uncontrolled mixing and joyful bastardization of what in the public mind were pure breeds could be considered subversive to the strict biopolitical norms of racial and genetic purity, outlined, for example, in the Nuremberg laws.

Behavior

Whereas the brothers seemed unconcerned with genetic health and purity, they gave more attention to a third set of criteria for judging wildness: animal behavior. Historical evidence is harder to come by, as behavior does not survive in archaeological records and is inconsistently reported in historical accounts. These present a heterogeneous bovine mythology with ancient cattle spanning the ferocious to the meek in folkloric forms diverse enough to legitimate almost any wild imagining. Lutz Heck was a keen hunter and was most drawn to historical descriptions of the animal's ferocity. The wild traits he was looking for included "fire, agility and bravery" (L. Heck 1936, 255). He specifically sourced specimens of Spanish fighting cattle for his back-breeding and continued to breed aggressive animals even after they caused havoc in the forest to which they were introduced (Frevert 1962).

Combative aggression is much less desired among contemporary breeders, like Gow, who have to anticipate the biosecurity risks (Buller 2008) of introducing their animals into public nature reserves. The Tauros Program reassures us that

> The Tauros will also be bred to function in our modern times. That means living in wild areas, but together with frequent visitors ... any individuals showing aggressive behavior towards people will be de-selected early on. In the future, it will probably be a task for the management of rewilded areas to, if needed, take out eventual dangerous individuals. (Goderie et al. 2013, 125)

Even in such risk-averse wilds, significant value is placed on animals that express forms of "naturalistic behavior" associated with a distrust and avoidance of humans, and a degree of hardiness that increases their autonomy from human care. Such concerns come to feature prominently in the practices of animal managers, who seek to defamiliarize animals from human contact, restoring interspecies ecologies of fear (cf. Collard 2014).

In the absence of contemporaneous knowledge, however, wild behavior tends to be established in negative opposition to that of agricultural kin. Heinz Heck suggested that "all specific domestic characteristics are faulty mutations that have been taken up by human breeders to change the animal for a particular unnatural purpose" (H. Heck 1936, 11). Historians have documented how many German and Austrian zoologists in the 1930s were strongly influenced by a romantic cult of the predator, a scorn for individuality, and a denigration of domestication and pet keeping. These were seen as exemplary of bourgeois, urban society and generative of the forms of physical and moral degeneration that so troubled advocates of eugenics (Deichmann 1996; Sax 2000; Burkhardt 2005). The popular ethologist Lorenz (1940) promulgated anti-Semitic derivations of this thinking, generating taxonomies of domesticated "Jewish" and wild "Aryan" animals (for dicussion, see Kalikow 1983; Sax 1997).

Lorenz received pictures of Lutz's cattle through their mutual acquaintance Oskar Heinroth, who suggested that they would be useful for illustrating his lectures on the degenerative effects of domestication.[10] Although it is clear that Lutz shared his National Socialist contemporaries' disdain for domestication (see, e.g., L. Heck 1929), we can find little evidence that he subscribed to (or at least promulgated) the prevalent anti-Semitic ideology. This is surprising given its ubiquity, his proximity to key advocates, and the strategic purpose it might have served his project.[11]

Ecology

The last and most significant criterion for judging the wildness of cows is their roles within a wider ecology. For Lutz Heck, the reconstituted aurochsen finally displayed their true wildness when they were released in large herds to do battle with human hunters in a specific forested (*Heimat*) landscape—making the animals themselves the ultimate arbiter of their own wildness. Lutz shared Goering's enthusiasms for hunting and forestry practices modeled on a contemporary reinvention of the *Nibelungenlied*. This epic medieval tale, in which Teutonic knights dwelling in the primordial forest hunt deer, boar, wisent, and aurochs (Reichert 2005), was prominent in the German nationalist self-understanding cultivated by the Nazis (Stoehr 2000).[12] It offers a "holistic" (after Harrington 1999) mythology of the lost aristocratic hunter, which legitimated the restoration of a heroic and elite cultural ecology of Germanic leadership. Reinvented traditional forms of hunting and forestry were presented as central to the optimal functioning of the ecosystem, with the hunter-forester naturalized as a beneficent keystone species (to use contemporary terms). Lutz and Goering went on numerous hunting parties together, during which they sought to relive these myths, wearing traditional dress and even carrying spears to connect with and rekindle their own wild natures. Their adventures were documented in a series of intimate photographic portraits taken by Lutz himself and others (see Figure 4).

Contemporary enthusiasts at Rewilding Europe have become increasingly future-oriented and open-

Figure 4. Photo of Hermann Goering and Lutz Heck on a hunting party, December 1934. *Source:* Bundesarchiv Bild 102–04224/ Georg Pahl.

ended in their choice of ecological baseline. In stark contrast to the premodern agrarian landscapes of medieval Europe that have dominated most European conservation, here cattle figure as harbingers of a postproductivist pastoral: future wilds whose ecological baseline is only loosely modeled on the preagricultural landscapes of the end of the Pleistocene (c. 11,700 BP). The science behind this model is informed by the Vera hypothesis (Vera 2000) about the importance of wild grazers for driving ecosystem dynamics but begins to make allowance for the novel ecosystems emergent in the Anthropocene. In a recently published definition, Rewilding Europe (2015b) explained that

> Rewilding is not geared to reach any certain human-defined "optimal situation" or end state, nor to only create "wilderness"—but it is instead meant to support more natural dynamics that will result in habitats and landscapes characteristic of specific area(s), with abiotic, biotic and social features that together create the particular "Sense of the Place."

Here cows and landscapes become wild through processes of dedomestication and abandonment. The genetics of the cattle matter less, so long as the animals can survive, graze, and thrill expectant publics. They are valued as ecological engineers; keystone species whose trophic agencies and postmortem decomposition will restore desired ecological functions and processes. Ecological complexity, resilience, and adaptation are the buzzwords here (Pereira and Navarro 2015).

The ecological role afforded people in these forms of rewilding differs markedly. For Lutz and Goering, the beneficent hunter-forester maintains the balance of a *Heimat* cultural ecology. For Rewilding Europe, people figure largely as urban, postproductivist observers: scientists, tourists, and a few local publics and the employees who will supply their needs (see, e.g., Rewilding Europe 2014). Their trophies will be virtual and they will leave only footprints. To use the terms of ecomodernism, here people will have been successfully decoupled from (rather than harmonized with) nature. A few might afford to visit, but they will not dwell in the wilds. Rewilding Europe imagines a radical form of decoupling akin to the models of land sparing, not land sharing, to use the terms of contemporary debate (Phalan et al. 2011). This requires (an often unstated) support for land intensification elsewhere to meet growing demands for food, fuel, and fiber. There is a silence in much of the rewilding literature about how and where this ought to occur or whether the current abandonment of land in Europe is occurring at the expense of tropical biodiversity destroyed through the globalization of agriculture.

Biopolitics of the Wild

To summarize, there are multiple, interconnected criteria through which wildness has been identified across the two chapters in this story. Anatomy, genomics, behavior, and ecology offer different, and sometimes conflicting, ontologies for conceiving and managing animal bodies, grazing ecologies, and associated human cultures. This genealogy helps identify three important dimensions to the biopolitics of this version of rewilding. First, it appears that bovine wildness is most commonly understood through an ecological conception of the wild. With a few exceptions, rewilders are less concerned with finding a transcendent form or genetic essence of the wild cow and more with their impacts in a specific ecological or landscape setting. Wild cows are valued in functional terms, by virtue of their restoration of missing ecological

(and cultural) processes (naturalistic grazing, fear, death, and decomposition). Rewilding here—as elsewhere in the world—comprises a holistic and ecologized biopolitics whose target is securing desired systemic properties emergent from, and primary to, populations of nonhuman life. Ecological engineering by naturalistic grazing and *Heimat* hunting-forestry offer two contrasting versions of such biopolitical targets.

Second, the wildness of these desired animals and their ecologies are frequently defined in opposition to that which is commonly understood to be domestic. Wild animal forms, behaviors, human encounters, and landscapes are identified in hierarchical comparison to modern agricultural breeds and landscapes. Third, rewilding imagines a return. In this regard, Lutz Heck is most reactionary: His wild is determined exclusively by when the wild was (lost). In contrast, the Tauros Program and Rewilding Europe are more proactive and progressive. They seek to deploy cutting-edge technology to generate future pasts. Genetic and paleoecological evidence of past authenticity is helpful, but there is a growing sense of the need to adapt to uncertain and unprecedented futures through nurturing the potential for wildness. Here wildness is understood less as a primitive state and more as a set of systemic properties for regeneration. Although the discursive legitimating periodization is consistently retrospective, there are fundamental differences in these deployments of the past.

Where Is the Wild?

The history of Heck cattle also allows us to interrogate the shifting geopolitics of wildness and its conservation in Europe. In this case we understand geopolitics to refer to the territorial practices of modern states and other supranational political agents through which concepts of the wild are legitimated and enacted. There are three broad dimensions we consider here. The first relates to the place of the urban, the second to territorial imaginations of a European "ecological heartland," and the third to the territorialization of nonhuman identity and provenance. Together these offer three further criteria through which to specify and differentiate the multiplicity of rewildings.

Antiurban Wilds

The consistent disavowal of domestication that we find in past and present definitions of the wild drives a broad antiurbanism in the territorial practices of European rewilding. Although the Heck brothers made their livings from engaging bourgeois urban society in their metropolitan zoos, the idealized locations for their cattle were rural forests. This is partly pragmatic: Wild cows threaten urban parks and gardens. But it also territorializes an antimodern conception of the wild that has been prevalent in different forms of twentieth-century conservation (Cronon 1996). As we shall see, Heck's Heimat cultural ecology can be situated within a broader reactionary modern movement in Nazi Germany that elevated Volkish, rural peasant life as the natural expression of a racialized relationship between "blood and soil" and deplored contemporary processes of land abandonment. This movement informed a pervasive antiurban ideology in which the urban figured as a site of moral degeneration (Radkau and Uekoetter 2003; Brüggemeier, Cioc, and Zeller 2005).

The urban occupies a more ambivalent place in the imagined geographies of Rewilding Europe that touches on a broader paradox of decoupling that is at the heart of an ecomodernist approach to conservation. On the one hand, it is the processes of urbanization that are creating new opportunities for the return of the wild in abandoned marginal areas (Rewilding Europe 2014). Yet, urban life is also understood to cause alienation and a pathological disconnection from nature, causing a host of psychological and social problems (Rewilding Europe 2014; see also Monbiot 2013). So far the proposed solution is not to rewild the city but to offer people fleeting tourist encounters with depopulated places. Urban ecologies have played little role in rewilding iconography, which has tended toward the untrammelled and remote (e.g., Widstrand et al. 2010). Within the wider rewilding movement, the evaluation of wild landscapes is frequently premised on a disavowal of modern human impacts. In spite of a recognition of the social features and novel ecosystems, the quality of contemporary wildness is frequently indexed to quantifiable markers of urbanization and human presence (e.g., Ceauşu et al. 2015).

Eastern Wilds

A second trend in the geopolitics of bovine rewilding is the continental-scale projection of power from Western to Eastern Europe (and sometimes beyond). This has happened through radically different political mechanisms across the period under analysis, but Eastern Europe is conceived as a form of ecological

heartland (after MacKinder 1904): a vital biological and cultural resource for Europe and its citizens and a gateway to the wild territories of Russia. Western European conservation enthusiasts—before and after the Cold War—have placed this territory within their legitimate sphere of influence and have argued that it is in need of their intervention and management (Schwartz 2006). Such imagined geographies of Eastern wilds are much less reported in the Anglophone academic literatures than the tropical and sub-Saharan visions that predominate in the histories of Western European colonial and postcolonial conservation (Grove 1995; Neumann 1998; Adams and Mulligan 2003).

In the case of Lutz Heck, the ideal of conserving Eastern wilds required and helped legitimate a desire for territorial control. In 1938 Goering appointed Lutz head of the Nature Protection Authority within the German Forest Service. This was a powerful role that enabled him to formally connect with the various organizations developing ideologies and policies for eastward expansion. When Germany invaded Eastern Europe in the following year, Lutz was well placed to enact his medieval vision of the wild by shaping emerging plans for the de- and reterritorialization (Barnes and Minca 2013) of eastern Germanic land. In May 1942 he signed a formal agreement with Konrad Meyer, integrating his nature protection authority with the Commissariat for the Strengthening of German Nationality (RKFDV[13]), under which the *Generalplan Ost* resided (Radkau and Uekoetter 2003; Oberkrome 2004). Working in this context, Heck presented the newly conquered areas as offering opportunities for the restoration and reconnection of Germanic people and wild natures.

Six months after the occupation of Poland, Lutz published an article in the official Nazi newspaper (*Völkischer Beobachter*). He claimed that "landscape protection is Volk protection, since here Nature protection works for the most precious possession we have, our greater German Heimat" (L. Heck 1940, 3). Two years later, at the height of the violent eastern expansion of the Nazi empire, he wrote an article for a journal edited by Konrad Meyer and aimed at those involved in extending the German population into the east (L. Heck 1942). He argued that the landscape of the *Ostraum* (eastern space) would need to be made Germanic. A few pages earlier in the same issue of this journal, Meyer had stressed the need for formative Germanic interventions to "replenish" the "shapeless landscape" and "racial substance" of the East (Meyer 1942, 205). Other authors in this journal sought to demonstrate how non-Aryan peoples had destroyed the Polish landscape. Using maps and aerial imagery the articles claimed to prove the degenerative processes of *Versteppung* (becoming steppe) associated with deforestation and soil erosion (Wiepking-Jürgensmann 1942).

Colonizing the east was presented as an issue of *Landschaftsgestaltung* (landscape formation) and *Landschaftspflege* (care for the landscape). In this Ratzelian, organicist geopolitics (Bassin 2005) the racial and cultural superiority of the German *Volk* in land management legitimated eastern expansion to secure *Lebensraum* for Germanic people and wildlife (cf. Blackbourn 2011). This discourse promoted a spatialized form of eugenics that mirrored the hunter's management of wildlife through the control of populations and environmental conditions. Here shaping the environment created both German land and a population naturally at home in its *Heimat* landscapes (Scherping 1938).

Although Heck and other prominent Nazis were keen to publicly promote such environmental and conservation causes, in practice few projects were realized and the interests and practices of industry, agriculture, and armament often received priority. Recent work by historians suggests that the "green" achievements of the Nazis have been overplayed (e.g., Brüggemeier, Cioc, and Zeller 2005). In practice, Heck struggled to align his interest in animal reintroductions and medieval hunting with the wider demands for agricultural autarchy, timber production, and *völkisch* resettlement that dominated the *Generalplan Ost*.

Nonetheless, Lutz was able to ship some of his wild cattle east, first into Goering's hunting reserve at Rominter Heide in East Prussia and then in 1942 to Bialowieza forest (L. Heck 1943). With advice from Lutz, Goering ordered a significant expansion of the forest reserve. Our research confirms existing accounts of how the discourse that entangled hunting, landscape care, and nonhuman *lebensraum* justified the displacement and genocidal purging of the indigenous human population (Radkau and Uekoetter 2003), in a fashion similar to that associated with some accounts of colonial conservation in areas of the Global South (Neumann 1998; Dowie 2009). Although Lutz rarely deployed anti-Semitic or racist discourse in his publications, he would have been well aware of how its reactionary and violent practices enabled his conservation activities.

The Cold War and the Iron Curtain put the ecological heartland of Eastern Europe off limits to

Western conservationists at the end of World War II. Heck cattle and back-breeding languished as landscapes and peoples were (often violently) "improved" through variegated state socialisms and collectivized agricultures (Josephson et al. 2013). The ecological consequences of these interventions were often less dramatic than the intensification of agriculture in Western Europe. When the Cold War ended in 1989, nations reemerged that were comparatively rich in wildlife. In the meantime, Western European environmentalism had flourished, becoming dominated by powerful nongovernmental organizations, which had developed constituencies, economies, and territories to support conservation at home and overseas. The global and international geography of biodiversity conservation that was ascendant in the 1980s was largely tropical and postcolonial (Takacs 1996; Adams 2004) and Western European organizations were initially slow to realize the wildlife on their doorsteps.

In Germany and elsewhere, the practices and challenges of reunification soon made manifest the ecological and political opportunities associated with European integration (Gross 2003). Conservationists traveling in postsocialist states were amazed by the extant diversity of flora and fauna they encountered. They saw a standing reserve of wild (premodern, agrarian, and pastoral) spaces and animals that required both protection and reconnection. Political territories, networks, and other topological forms were needed to secure populations from land use change, to create opportunities for Western European tourism, and to facilitate westward animal movements through the construction of a network of nature reserves, ecological corridors, and forms of green infrastructure (Schwartz 2006). Here the Cold War comes to figure as having brought an ecological dividend.

Conservationists (in various guises) have been in the vanguard in establishing political and ecological conditions for postsocialist countries seeking accession to Europe. Creating spaces for biodiversity became an important requirement for joining the European Union (Waterton 2002; Kay 2014). Here the wild would be secured through the democratic and bureaucratic practices of classification, designation, and action plan implementation. A key strand of this process was the "greening" of the Common Agricultural Policy (CAP) to support environmentally friendly farming and rural development (Brouwer and Lowe 2000). The aim is to subsidize forms of low-intensity (premodern) agriculture, using democratic mechanisms to secure cultural landscapes not dissimilar to the *Heimat* ecologies encountered earlier.

Rewilding enthusiasts across Europe take issue with conservation performed through the CAP because it largely delivers a premodern agricultural ecology at odds with the postproductivist pastoral driven by natural processes outlined earlier. They are keenly aware of the growing sense that this model of agricultural subsidy is unaffordable in an economically weakened yet still enlarging Europe (Merckx and Pereira 2015). Members of Rewilding Europe suggest that "it's our somewhat nostalgic craving for outcompeted, unprofitable old farming systems that makes the 'management' of European nature so expensive" (Goderie et al. 2013, 148). The opportunities presented by growing rates of land abandonment (Navarro and Pereira 2012) in marginal and upland areas of southern and Eastern Europe have shaped the geography of their interventions. As of 2015, the organization is working in seven marginal areas in nine countries (Spain, Portugal, Italy, Poland, Croatia, Slovakia, Ukraine, Bulgaria, and Romania; Rewilding Europe 2015a). The Eastern focus of Rewilding Europe is perhaps more opportunistic than strategic, and these sites are presented as part of an expanding European Rewilding Network. Nonetheless, the ultimate aim of this program, as the title of one important lobbying event suggests, is toward "Rebuilding the Natural Heart of Europe" (Wild Europe 2010).

Rewilding Europe is a reformist, modernizing organization, in stark contrast to the reactionary, fascist political program that enabled Lutz Heck and Goering's interventions. It dedicates a large portion of its time and resources to lobbying for legislative change in Brussels, to communication and marketing, and to developing market and financial mechanisms to fund conservation in marginal areas (including species banks and loan schemes for ecotourism operators; Rewilding Europe 2014). Our research did not include ethnographic work in any of the Rewilding Europe field sites, but our analysis of their textual materials and interviews with organization representatives identify a commitment to carefully navigating the interests of local communities and working with the local partner organizations in nominating the field sites that were included in the Rewilding Europe program. Existing work on the political ecologies of market-based ecotourism in marginal areas would suggest, however, that the decoupling model advocated by Rewilding Europe will be hard-pressed to fill the cultural,

political, and economic gaps left by the demise of agriculture (Honey 2008; Duffy 2012; Cortes-Vazquez 2014).

In her work on Rewilding Europe in Latvia, Schwartz (2006) noted how the austerity geopolitics of declining subsidies involves a corollary push for the intensification of traditional farming on fertile lowland sites. She explained how the postagrarian visions of Western European of rewilding enthusiasts have been resisted by nationalist movements in post-Communist states who mobilize a mythology of the peasant in an "agrarian ethnoscape" to resist external authority and expertise. We would anticipate that similar challenges would face Rewilding Europe in its operations in other field sites. Indeed, the dubious (i.e., nonnative and artificial) genetic provenance of the introduced, back-bred animals has been mobilized to resist their introduction: Through a somewhat perverse twist, Heck cattle have been presented as ideologically and ecologically invasive (Daszkiewicz and Aikhenbaum 1999) as a result of their Nazi origins. Although the cattle are clearly symbolically charged, their complex pedigree (Driessen and Lorimer 2016), malleable natures, and animal agencies make this argument hard to sustain. Heck cattle are by no means the authentic ur-ox, nor are they a contemporary vehicle for Fascist entryism.

Postnational Wilds

The third important dimension to the shifting geopolitics of rewilding in this story relates to the contrasting geographies of identity expressed in the different origin stories offered for back-bred cattle. In 1939, Lutz claimed that "the extinct Aurochs has arisen again as German wild species in the Third Reich" (L. Heck 1939, 537). A singular figure of a Teutonic, Germanic (perhaps even Aryan) aurochs was at the heart of Lutz's vision. He flagged the German origins of the word *ur-ochse*—aurochs—and argued that these were the timeless animals of the *Nibelungenlied*. Here the expansionist postnational geographical aspirations of the Third Reich are justified by appeals to a medieval, sylvan, and prenational geography of rooted Teutonic tribes and their wild beasts. This same origin story was mobilized to justify the eradication of Europe's rootless Jews (see Schama 1995) and informed early efforts to classify and eradicate nonnative species (Simberloff 2003).

The Tauros Program offers a very different origin story that takes the aurochs back to ancient Greece—*Tauros* being the Greek word for *bull*. They explain that

> In Greek mythology the god Zeus once took the shape of a bull, when he swam over from Crete to present day Lebanon and snatched away a beautiful princess. Her name was Europa. The aurochs has always been at the very root of the whole idea of a continent called Europe. It is in fact our continent's defining animal. (Goderie et al. 2013, 4)

Rooting the animal in an Enlightenment story of Europe's classical origins circumvents vernacular and chauvinistic appeals to medieval folklore (Schama 1995). It offers a more pluralistic and cosmopolitan animal identity and geography of belonging. The Tauros Program is happy to contemplate multiple European cows, tailored to local ecologies, climates, and cultures, making use of the forms and practices of local animal breeding. Their Aurochs 2.0 will be singular in its ability to return ecological processes but differentiated in its local specification (for a discussion of the multiplicity of Iberian rewildings, see Pellis, Felder, and van der Duim 2013). The reterritorialized biogeographies of these new bovine natures resonate strikingly with new and contested approaches to the classification and management of the invasive species that characterize the novel ecosystems of the Anthropocene (Marris 2011). Here a species' provenance matters far less than its functional impacts (Davis et al. 2011).

To justify this federal, supranational vision of a rewilded Europe, the Tauros Program and Rewilding Europe reference the prehistoric (and prenational) geographies of early human settlers moving with animals in a borderless Europe (Goderie et al. 2013). Not quite noble savages, these nomads at least emerge as untroubled by petty nationalisms. Aesthetic, epistemological, and political appeals are frequently made to the famous aurochs cave paintings at Lascaux. Associated text flags the sophistication, longevity, and commonality of this history. The continent is made even more permeable and connected by cartographic reference to lower sea levels and the absence of the North and Black seas (Goderie et al. 2013; Rewilding Europe 2012).

To summarize, this short tour through the shifting geopolitics of rewilding in Europe helps identify three further means of specifying and differentiating rewilding. First we find a consistent antiurban territorialization of wildness as out there and, second, out east. Alongside an enthusiasm for their local wildlife, Western European elites figure rural Eastern Europe as an ecological heartland in a unified continental bloc. Its future is to be

secured in radically different ways, but the projected sphere of influence is common. Third, we find that wild cows are seen to belong in a post- or supranational landscape. These futures summon forth contrasting origin stories that either narrowly prescribe rooted natives or permit cosmopolitan nomadic wildlife.

Who Knows the Wild?

The story of Heck cattle and rewilding also permits a brief genealogy of the knowledge practices through which the wild is known and enacted. Historic and contemporary advocates for back-breeding and rewilding make significant reference to the political epistemology (Latour 2004) of science and reason as the guiding and legitimating logics for their practices. But, as we have seen, there are multiple and sometimes discordant scientific disciplines and epistemologies at work here. Furthermore, there have been powerful tendencies in the history of rewilding that are ambivalent or even antipathetic to some forms of science and technology and their relationships to politics, culture, and ecology.

Enchantment

For example, the Heck brothers afforded great significance to intuition and enchantment in the knowledge practices of rewilding. Lutz often boasted of his experience as a hunter and as an animal breeder in accounting for the claimed success of his experiments (L. Heck 1936, 1954). This was knowledge gained not from textbooks or in laboratories but out in the field and in the forest (and from growing up in the Berlin Zoo). His was the earthy, vernacular expertise of someone in touch with folk traditions of hunting and forestry. Lutz was full of wonder at wildlife. He marveled at the power of wild cattle, and the brothers described the reemergence of the aurochs through their haphazard breeding and reintroduction programs as "miraculous" (H. Heck 1951), testament to the vitality of the wild archetype rather than the triumph of mechanistic human control. In many ways, Lutz's discourse is exemplary of the forms of "reenchanted science" that Harrington (1999) documented in her account of holistic thinking in late nineteenth- and early twentieth-century German culture. Herf (1984) linked such holistic thinking to reactionary modes of science under National Socialism.

An enchanted, holistic epistemology of bovine wildness also underpins the knowledge practices of the Tauros Program—although clearly with none of its anti-Semitic and declensionist associations. The steering group of experts assembled to guide the Program includes field ecologists, geneticists, an archaeologist, and—perhaps most interestingly—the renowned Dutch cattle painter Marleen Felius. Felius is the author of a definitive illustrated encyclopedia of cattle breeds (Felius 2007). She has been given a central role in the breeding program, applying her aesthetic skill to animate the inert archaeological materials through the creation of a series of cattle drawings.

Felius's paintings imagine aurochs bodies, herds, and ecologies in a range of prehistorical settings. In a further turn of the hermeneutic circle introduced earlier, Felius and her art help guide the selection of desirable animals for subsequent breeding. Tensions between this holistic approach and a more mechanistic and reductionist epistemology of wildness were behind the splintering of the Program and the establishment of the rival Uruz breeding project discussed earlier. For the former, the naturalistic field craft of in vivo breeding is primary to in vitro laboratory reincarnation experiments, although the pan-European distribution of the Tauros breeding stock necessitates in vitro fertilization and embryo transplants.

Myth

The second connected epistemological dimension relates to the place afforded myth in the practice and the promotion of rewilding. Wild cows and other large herbivores gained some prominence in Nazi propaganda. For example, in 1941 Goering commissioned a film that featured Heck's European bison (wisent). It opens with a closeup of an ancient copy of the *Nibelungenlied* and is set against the backdrop of the ongoing war. The narrator explains that "the swift victory over Poland has brought a welcome return of pure blooded wisents to Germany . . . giving justified hope for the conservation of the wisent, the strongest wild animal and the last witness of former Germanic primordial forest" (Schulz 1941). In 1938, the Heck brothers joined Himmler's *Ahnenerbe*—the shadowy research organization that sought to use science to legitimate mythological understandings of the Aryan people (Kater 2006)—and were commissioned to write a popular book on the zoological and cultural history of the aurochs.[14] This publication does not seem to have been written but formed part of a research project entitled *The Forest and Tree in the Aryan-Germanic History of Thought and Culture*, headed by Lutz.

In this popular propaganda the cattle are presented as charismatic catalysts for reconnecting elite, alienated, modern, urban German citizens with their true Heimat natures. Lacoue-Labarthe and Nancy (1990) drew attention to the centrality of myth to Nazism. They argued that it is not so much the content of the myth that mattered but its performative function, especially the belief in its efficacy in producing a national identity. Heck's back-breeding project allowed Goering to stalk through the forest carrying a spear, legitimizing his policies and the Nazi war efforts by the purported truth of Germanic mythology—taken as serious as, and fully incorporated within, a form of widely respected natural science.

The power of myth—here embodied in the cosmopolitan figure of Europa—is also central to the Tauros Program, who argue that "the aurochs is now stepping out of the shrouds of myth, but maybe more than ever remains a legend" (Goderie et al. 2013, 74). Shorn of their reactionary associations, charismatic wild cows are afforded political power in the marketing materials of contemporary back-breeders and rewilders. Felius's paintings have been deployed along with professional wildlife photography and film to inspire Western Europe's citizenry in favor of the wild (e.g., Widstrand et al. 2010). Rewilding enthusiasts have begun to link their discourse to prevalent contemporary anxieties about a growing "nature-deficit disorder" (Louv 2013) or "ecological boredom" (Monbiot 2013) among urban publics. It is argued that encounters with wild cattle will catalyze enchantment, reconnecting people with more wholesome wild landscapes (Goderie et al. 2013). In their commitment to recognizing local bovine identities, the Tauros Program deploy their cattle as "flagship species," charismatic boundary objects that can bring together different epistemic communities (Lorimer 2007). Whereas Goering used science to legitimate an exclusive myth, here myth helps communicate and democratize science. Scientific arguments for primeval authenticity, ecosystem services, and future adaptive landscapes are made accessible, alluring, and commercially valuable through the affective logics of wildlife film.[15]

To summarize, in this section we have identified the importance of a holistic epistemology for the identification of the wild. This values intuition and field craft over mechanistic science and extends to a celebration of enchantment and myth. Here wild cows figure prominently as a catalyst for reconnecting alienated urban publics with nature and significant importance is attached to the transformative aesthetic potential of wildness to foster a desired citizenry. For Lutz Heck and Goering this was archetypal reactionary modernism as documented by Barnes and Minca (2013). In contrast, the Tauros Program offers a more postmodern aesthetic and epistemology in which multiple forms of expertise and sentiment mingle and collaborate, attuned to their local ramifications.

Conclusions: Specifying Rewildings

In this article we have offered a brief, cautionary genealogy of a form of European rewilding—focusing on nearly a hundred years of enthusiasms for back-breeding, dedomesticating, and reintroducing wild cattle. We centered our analysis on the biopolitics and geopolitics of the wild and the forms of expertise that come to speak on its behalf. This is a nuanced and nonlinear story. It shows wildness as multiple, enacted by humans and nonhumans in strikingly different forms—whereby superficially similar practices and discourses diverge in important ways.

The story of Heck cattle is an extreme example and cannot be made to stand in for the full diversity of rewildings past and present. Nonetheless, it shares at least five of the broader characteristics of rewilding identified in recent reviews and histories (Jørgensen 2015; Lorimer et al. 2015). First, back-bred, dedomesticated, feral, or otherwise "wilded" mammals feature frequently in the colorful (and often dark) histories of modern nations' efforts to naturalize the taming or wilding of their subject populations. These range from Chillingham cattle (UK) to German shepherd dogs, Indian cows, and Polish wisent (for these and more examples, see Sax 2000; Ritvo 2010; Skabelund 2011; Sharma 2012).

Second, the promotion of large herbivores for naturalistic grazing is perhaps the defining feature of European rewildings, in contrast to a North American focus on predators (Foreman 2004). Third, rewilding visions the world over grapple with the diverse temporalities implied by the *re-* in rewilding that come to the fore in this account. Fourth, they also tend to share the ecological ontology of socionatural relations (trophic, predatory, decompositional, etc.) that predominates in this account. Finally, the fraught colonial and postcolonial historical geographies that emerge (in extreme form) within this story are common to actual and proposed rewilding projects the world over. Although these histories differ, they require close and sustained attention to learn from, avoid, and redress the historic injustices of colonial conservation (see Adams and Mulligan 2003).

In this article we have examined rewildings as forms of reactionary and eco modernism. In conclusion, we would like to return to this framing and its implications for understanding contemporary conservation, before summarizing some dimensions for specifying rewildings in other times and places. Although it seems paradoxical, the various rewildings reviewed here are thoroughly modern in their geo- and biopolitics. These are not primitivist retreats to a "world without us" (Weisman 2007) through a disavowal of science, technology, or bureaucracy. In contrast, they have sought to harness cutting-edge science and biological and political technologies in their efforts to unravel cultures and ecologies of domestication. Laboratory and field spaces and knowledges are entangled in scientific experiments to reverse years of agricultural improvement. Although advocates take issue with the alienating consequences of urban, industrial life, they are not averse to using its tools for governing otherwise. Animals (or their semen) are shipped great distances across the continent for reintroduction, and politicians have sought to leverage the bureaucracy and resources of radically different postnational authorities to fund and regulate diverse forms of social and ecological wildness. These range from the violent military dictatorship of the Third Reich to the local subsidiarity, democratic deliberations, and market mechanisms of the European Union.

In mapping these modern forms of conservation, we have identified how the prevalent mode of biopolitics of rewilding is ecological and focuses on specific landscape milieu, intervening in socioecological systems to secure desired systemic properties. In the invaded territories of the Third Reich it was targeted at a premodern, equilibrium ecology of Heimat, where cattle enable the performance of mythologized and xenophobic social relations. In the twenty-first century, cattle instead reemerge as "ecological engineers" whose naturalistic grazing will deliver valued ecosystem services, like biodiversity, flood mitigation, and carbon sequestration, alongside more cosmopolitan cultural connections to postproductivist and decoupled future wilds. Although the political ecologies of these two enactments of the wild differ greatly, they share an ecologized or environmental mode of biopolitics. This analysis develops existing work in geography on the biopolitics of managing human and nonhuman populations, to explore interventions targeted at the background environment (or milieu) in which life emerges (cf. Braun 2014).

This story reveals that there are radically different ways of enacting modern conservation. We identified strong reactionary tendencies toward a dark "anti-modernity" (Barnes and Minca 2013) in some of the early forms of rewilding documented here. These depart from the Enlightenment ideal of liberal, democratic progress guided by rational and deliberative science. This was clearly manifest in Lutz Heck's entanglements with the *völkisch*, genocidal bio- and geopolitics of National Socialism and his support for an authoritarian politics modeled on the mythical authority of the charismatic medieval hunter-forester. The reactionary extremities of this desire for the wild are reassuringly absent from contemporary practice.

In many ways, the twenty-first-century efforts to rewild Europe that we report here are exemplary of emerging forms of ecomodernism. They display a much more optimistic belief in the potential of science and technology to decouple people from nature and secure territories for wildlife. They maintain a resulting ambivalence about centrality of urban life and important questions remain about the geopolitical economy though which decoupling is proceeding and should proceed. Epistemologically, there are tensions between the instrumental science and economics of decoupling and a residual romanticism best expressed in the use of flagship species to engage publics. Such tensions are clear within the ecomodernist manifesto (and among the wider interests of its authors), which champions both a "love" (Asafu-Adjaye et al. 2015, 25) of nature and a desire to make it serviceable to modern development.

To make sense of these differences it is vital that we find ways of specifying the darker sides of rewilding, in ways that are more nuanced than the sensationalist popular parody of National Socialism (with which we opened this article) or an ahistorical analysis of the exception. In Figure 5 we expand on our genealogy of Heck cattle to offer six axes for specifying such rewildings. They relate specifically to the story recounted here and are not exhaustive, but we anticipate that they will be helpful for analyzing rewildings elsewhere. For heuristic purposes, we present these axes as linear continua arrayed between, or populated by, ideal types. It is unlikely that any wilding project can be definitively placed, but these axes begin to develop criteria for definition, comparison, and critical analysis.

The first axis maps differing ontologies of wilding arranged on a continuum that moves from a reductionist and compositionalist concern with nonhuman form (genes, anatomy, species, breeds) to a more holistic and functionalist concern with landscapes and ecological

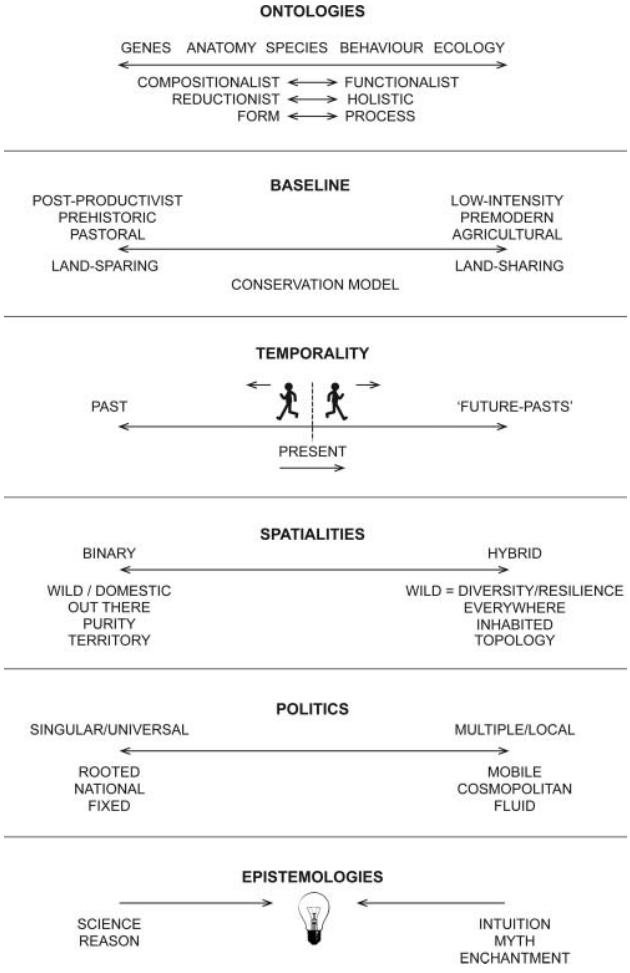

Figure 5. Criteria for specifying rewildings.

processes. The examples in this article can largely be placed on the right side of this axis, even though the ecological functions, desired behaviors, and natural processes that inform them diverge strongly.

The second axis describes the ecological baselines that inform and are performed through wilding. It moves from the prehistoric, postproductivist pastoral (of the Pleistocene rewilders in North America and Russia; e.g., Zimov 2005; Donlan et al. 2006) through to the low-intensity, premodern agricultural (valued by orthodox European nature conservation). The former implies modes of land sparing, the latter land sharing.

A third axis visualizes how these baselines inform the temporalities of present wilding projects according to their past or future orientation. This picks up on Latour's (2007) critical evaluation of Western environmentalism's preoccupation with the past and reluctance to face the future. A retrospective temporality is certainly characteristic of Lutz Heck. The contemporary rewilders in this story are more future-oriented. In coming to terms with the Anthropocene, they offer more dynamic future pasts: what we have here termed a postproductivist pastoral. These make reference to the past and to emerging novel ecosystems and could thus be characterized by multiple stable states (see Lorimer and Driessen 2014).

A fourth axis charts the spatialities of wildness. At one end is a binary geography in which wildness is defined in opposition to the urban and the domestic, as a pure domain marked either by the absolute absence of human impacts or the absence of signs of modern life. An imagination of absence is common to the decoupled geographies of contemporary rewilding. For the Heck brothers the wild was a site inhabited by select humans whose biology and rootedness made them at one with a purified nature. This binary spatiality can be contrasted with a nondualistic geography that does not feature in this story, in which wildness is potentially everywhere, comes in multiple spatial forms (topologies), and might be found in the cracks and fragments of urban life (see Lorimer 2015).

A fifth axis plots the different political identities of the wild. At one extreme is the singular, universalized, fixed (and sometimes fascist) figure of the rooted national native—characteristic of the wild imaginaries of Lutz Heck and Goering. At the other end is a local, differentiated, fluid, and mobile figure of the postnational wild that we find in Rewilding Europe and the cosmopolitan cattle of the Tauros Program.

The final axis charts differing epistemologies of the wild informed by the relative significance afforded science and reason over intuition, myth, and enchantment. As we noted earlier, there were strong reactionary tendencies in some of the early forms of rewilding documented here, which are reassuringly absent from the reformist romanticism that characterizes contemporary practice. For Lutz Heck and Goering, zoological science legitimated nationalistic mythology. In contrast, for Rewilding Europe, myth becomes a means of popularization and a way of engaging publics. For the Tauros Program the enchanting charisma of their cattle offers a means to engage and work with diverse experts and publics.

As a postscript we would like to reiterate that contemporary rewilders are in no sense "Nazi," nor are their Heck or Tauros cattle "Nazi cows." Heck cattle were shaped by and functioned as part of the fascist logics of National Socialism. This gives them fraught symbolic freight. But it would be both deeply ironic and somewhat tragic to now manage (i.e., cull) them on these grounds.

The promotion of their Nazi heritage seems to have backfired on Derek Gow. His cattle have proved too aggressive and dangerous for use in UK conservation. He offered some to Edinburgh Zoo as a historical curiosity, but one bull escaped soon after and terrorized visitors. Five years after his first tabloid splash, Gow was back in the news to reveal that his "Herd Reich" has "been turned into sausages" (Losh 2014). Populist enactments of the wild have a habit of becoming performative.

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Notes

1. Derek Gow runs the West Country Wild Life Photography Centre (WCWPC), which "offers the opportunity to photograph or film a splendid collection of captive British mammals in highly naturalistic settings" (WCWPC 2015). He is also a leading expert in water vole reintroduction and keen advocate for the return of beavers to the United Kingdom. He breeds captive populations of these and other animals.
2. An abbreviated online version of the original article can be found at www.westernmorningnews.co.uk/West country-farm-home-German-super-cows/story-11424807-detail/story.html.
3. We take the concept of genealogy from Foucault (1977), for whom, as Elden (2009) explained, it constitutes "a mode of historical enquiry that seeks to trace the emergence and descent of terms and categories *(and we would add materials and practices)*, and the interrelation of power and knowledge in their deployment" (270). We are not so much interested in the origins of the term rewilding (and its synonyms and correlates) as in providing a history of their present use and reflections on their future possibilities.
4. Latour used the term *reactionary* in an unpublished piece commentating on Nordhaus and Schell-enberger's book *Breakthrough* (Latour 2007, 7). A condensed version, without the term reactionary, is found in Latour (2011). In a further essay (Latour 2010), he cautioned against the term reactionary and the linear model of time, progress, and critique it implies. Latour (2015) has more recently sought to distance himself from ecomodernism, as it is put forward by the Breakthrough Institute.
5. The archives at Berlin Zoo are private and we were not able to gain access. They might contain further relevant information regarding Lutz's breeding program and his associations with National Socialism.
6. This reputation owes something perhaps to their depiction in Tournier's (2000) novel *The Ogre*. Tournier apparently based his literary rendition of rampant back-bred aurochsen and the extravagant eccentricities of Goering's hunting in the Rominter Heide forest on the memoirs of his head forester Walter Frevert (1962).
7. For more information on Rewilding Europe, see www.rewildingeurope.com.
8. For more information on the Uruz project and their plans for aurochs deextinction, see www.truenaturefoundation.org.
9. Both Lutz's approach to wisent conservation breeding and the "aurochs" back-breeding projects were scorned before and after the war by critical colleagues for their lack of purity (see, e.g., Mohr 1939).
10. It is unclear whether Lorenz actually used the images. See SBBPK (*Staatsbibliothek Berlin, Preussischer Kulturbesitz*), NL 137/27: Oskar Heinroth correspondence, Konrad Lorenz, letter Heinroth to Lorenz 6-2-1939; Lorenz to Heinroth, 19-2-1937.
11. The ideological leanings of Heinz Heck seem to have been even more complicated and were subject to intensive and protracted investigation by the Nazi authorities (Driessen and Lorimer 2016). See BundesArchiv NS 15/138, 18–31; BArch PK E38, 2845–2916; BArch NS 15/138, 31; BArch PK E38 p. 2862, cfr. 2912.
12. Wagner also took up this legend in his *Ring des Nibelungen*. The notion of *Nibelungentreue* (Nibelungen loyalty)—the total dedication to fight until the last man—was used by Goering in addressing the Wehrmacht just before the collapse of Stalingrad.
13. The RKFDV (*Reichskommissariat für die Festigung deutschen Volkstums*) was the authority headed by Himmler and charged with populating the east with people of proper Aryan descent.
14. BArch NS 21/G120, 1071ff., 1111ff.
15. See, for example, *The New Wilderness* (Smit and Verkerk 2013), a blue-chip wildlife documentary about the OVP released in 2013 (www.thenewwilderness.com/).

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JAMIE LORIMER is an Associate Professor in the School of Geography and the Environment at the University of Oxford, Oxford, UK OX1 3QY. E-mail: jamie.lorimer@ouce.ox.ac.uk. His research interests include the politics of science in relation to wildlife conservation, the Anthropocene, animal geographies, and the human microbiome.

CLEMENS DRIESSEN is a lecturer in the Cultural Geography chairgroup at Wageningen University, 6708 PB Wageningen, The Netherlands. E-mail: clemens.driessen@wur.nl. He has worked on the cultural and technological lives of animals (both in the wild and on farms), while seeking to explore shifting human–animal relations through creative and technological design.