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Chapter 10

ACTOR-NETWORKS, CONSERVATION TREATIES, AND INTERNATIONAL ENVIRONMENTAL HISTORY

Re-assembling conventions

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Re-assembling conventions

Raf De Bont and Simone Schleper

The past century has witnessed an increasing number of multilateral agreements and conventions that aim to conserve nature across the globe. The focus of these agreements and conventions concerns a great variety of topics – including the transnational protection of wetlands, migratory animals, biological diversity, and the global climate, as well as the cross-border control of wildlife trade, the spread of invasive species, the movement of hazardous waste, and the export of tropical timber (see Chapter 13, this volume). Historians and political scientists have not failed to notice this proliferation of agreements and conventions. By now, there is wide-ranging literature on their content, how they have been negotiated, and the extent to which they have successfully achieved their policy goals (Boardman 1981; Bsumek et al. 2013; Cioc 2009; Lausche 2008; Meyer 2010; Nagtzaam 2009). The study of international conservation conventions indeed has become a well-established field.

While diverse in their approaches, most studies on international environmental treaties and conventions share one thing. The great majority of them focus on human actors and the social institutions these actors represent – whether these institutions are states, NGOs, scientific associations, intergovernmental organisations, or corporate lobby groups. Therefore, stories about the making and policing of treaties are often stories about the interests of human individuals and the groups they speak for. While relevant, such stories also seem unidimensional. This chapter will use actor-network theory (ANT) to make the case for an approach that widens the view. We will argue that making conventions, and making conventions *work*, involves the mobilisation not just of humans and their institutions, but also of non-human organisms and things. Inspired by ANT, we will claim that treaties exert performative power only when embedded in hybrid networks – networks made up of relations between living and non-living entities. Overall, we will propose to write the history of treaties in terms of changing relations within such networks. By doing so, we build on the literature that deploys ANT to broaden our understanding of contemporary conservation practices (Bennett 2018; Jepson et al. 2011; van der Duim et al. 2014; Whatmore and Thorne 2000). Of course, ANT's focus on the interaction between human and non-human

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agents ties in with long-established interests in environmental history writ large. In this chapter, we particularly seek to extend historical scholarship in which environments are conceived "as fields of agency and power in which the human and nonhuman intermingle" (Sutter 2007: 729; see also Antonello 2019; Mitchell 2002: 19–53) in order to show how networks connect the paper world of environmental legislation to the material world of legislated environments.

After introducing the methodological outlines of ANT, we illustrate its potential for the study of international treaties by exploring two cases. First, we discuss the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the ways in which this convention made a difference for the functioning of zoological gardens. Second, we analyse the mobilising power of the African-Eurasian Migratory Waterbirds Agreement (AEWA). Both cases, we argue, illustrate that what treaty texts *do* (if they do anything at all) relies on networks that are varied, ever-changing, and often unstable. Environmental historians are obviously familiar with the important question of whether and to which extent legislation can stem environmental degradation. By taking a relational approach and broadening the number of living and non-living actors, we believe ANT can help in providing answers to that question.

Actors and networks

ANT is traced back mostly to the work of Michel Callon, Bruno Latour, and John Law (Callon 1986; Latour 1987, 1988, 2007; Law 1987), who, in the 1980s, developed new approaches to study science and technology "in action". Today, ANT has become hugely popular in the humanities and social sciences more generally, and scholars have used it to explain a broad range of phenomena. As is often the case with hugely popular approaches, opinions diverge on what exactly its main tenets are. Yet, a handbook summary usually stresses a few characteristics. The first is that ANT conceives of actors not as wilful agents, but as entities that in some way influence other entities. This explains why not just human beings, but also ships, scallops, or maps can figure as actors in ANT analyses. Secondly, and in line with the first point, ANT seeks to explain agency not by referring to the qualities of the actors themselves, but by the relations among them. This, then, leads ANT scholars to study how entities of various kinds assemble to form "actor-networks", "collectives", "associations", or "assemblages".

We believe an approach inspired by ANT is useful for our purposes because it can sensitise us to aspects of the history of international conservation treaties that so far have received little attention. The sociologist John Law (2016) highlighted four central "ingredients" of ANT, all of which we believe are helpful in understanding the cases at hand. The first is ANT's attention to the heterogeneity of relevant actors. As indicated, the existing scholarship on conservation treaties – even when it occasionally took inspiration from ANT (Bled 2010) – has focused on humans and their organisations rather than on non-human organisms and things. There is, thus, ample room to develop a more symmetrical approach, paying attention to the role of, for instance, technological and animal actors. Second, ANT scholars encourage us to think of both human and non-human actors in terms of "semiotic relationality". They do so by stressing that the entities in a network continuously "define and shape one another". In this line of reasoning, treaties are shaped by the people who write and negotiate them, but the treaties, in turn, also shape the negotiators. Furthermore, both the negotiators and their texts can be understood only in relation to a variety of other human and non-human actors. Third, ANT alerts us to what Law refers to as “process” and “precariousness”. While international treaties can be associated with a particular date of ratification, their meaning and influence *change* with the assemblages they are embedded in. Such assemblages, furthermore, might collapse as soon as one of its constituting actors stops playing its part (Law 2016: 146). Finally, ANT is attentive to issues of power, place, and scale. It has developed a particular interest in information flows and forms of standardisation that enable “centres of calculation” to act “at a distance” (Latour 1987). International treaties, of course, can be easily understood as tools that play a part in such long-distance acting. In brief, ANT can help us understand the performative power of international conservation treaties or the lack thereof.

CITES and the functioning of zoos

Our first exploration into the actor-networks of international treaties concerns CITES and how it has shaped zoo practice. Largely drafted by the International Union for the Conservation of Nature (IUCN) in the 1960s, CITES sought to regulate international trade in wildlife and wildlife products to assure the survival of threatened species in the wild. As zoo traffic made up only a relatively small part of that trade, it might not surprise that zoos were hardly involved in the early discussions about the convention. Once ratified, however, they were quickly drawn into CITES’s expanding assemblage. In what follows, we will look into CITES’s meaning for and power over zoos in two steps. First, we will analyse how various groups of human actors – in ANT, sometimes referred to as “social groups” (e.g., Latour 1988) – continuously renegotiated the treaty’s significance, reach, and modalities. In a

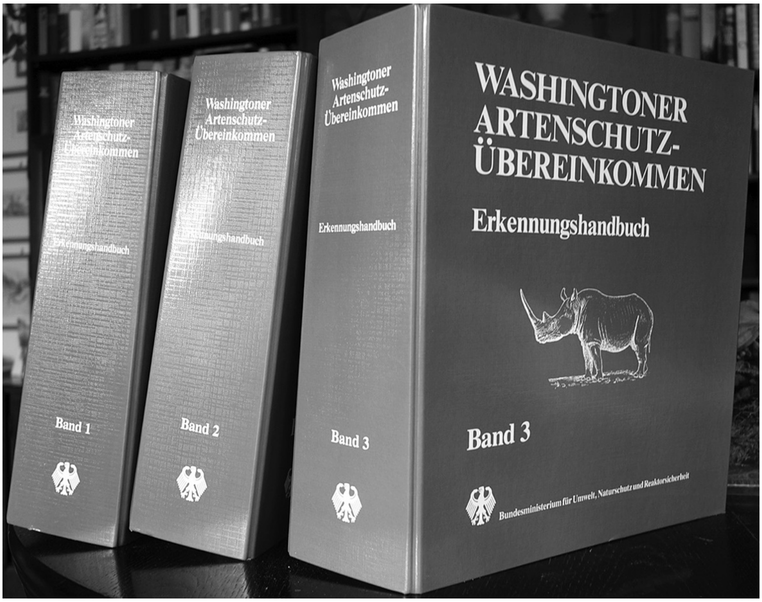

Figure 10.1 A CITES identification manual, showing pictures of the most smuggled species. Bundesministerium für Ernährung, Landwirtschaft und Forsten. 1985. Washingtoner Artenschutzübereinkommen, Erkennungshandbuch. Kunststoffordner, Band 1 bis 3 (Fauna). Collection G. & C. Franke. Wikimedia commons.

second step, we will show how non-human things and organisms, too, took part in this renegotiation process. Both types of agent, we believe, are crucial if we want to understand the material impact of CITES, and, thus, its significance for environmental history.

Initially, the preparation of CITES concerned only a small network of IUCN-related conservationists. By the mid-1960s, IUCN staff started to circulate draft texts to representatives of national governments. Some (such as the US government) largely supported IUCN's agenda, but "wildlife producer nations" in the Global South proved more sceptical. It was therefore only with a lot of effort that, in 1973, the negotiators reached a complicated compromise (Boardman 1981: 88–96; Hutton and Dickson 2005; Reeve 2002; Wyatt 2021). The compromise text sought to regulate trade through three appendices, which listed species in various states of endangerment. These lists served as the basis for a global system of import and export permits to control and limit the trade in endangered species. The convention entered into force after ten states had signed it – a number reached in 1975. From then onward, a Conference of the Parties convened every two and a half years to decide on amendments, which implied that the modalities of the treaty were continuously renegotiated from then onward (Boardman 1981: 88–96; Duffy 2013; Hutton and Dickson 2005).

Drawing zoological gardens into the CITES's actor-network proved difficult. In the 1960s, zoo organisations maintained only a loose relationship with IUCN, and some were taken aback by its initiative (Bayma 2012: 122). Initially, regional zoo associations exerted pressure on national authorities to weaken the convention's implications. In the United States, for instance, the American Association of Zoological Parks and Aquariums (AAZPA) lobbied Congress to keep trade restrictions to a minimum (Bayma 2012: 122). As one involved curator indicated, their goal was to stem "the torrent of recent adverse unwarranted animal-related legislation" and avoid zoos being "legislated out of business" (Todd 1975: 22). Simultaneously, however, CITES fed into ongoing initiatives of zoo reform. From the mid-20th century onward, regional and international zoo organisations actively tried to rebrand their member institutions as harbingers of science and conservation. Leading zoos increasingly dissociated themselves – at least rhetorically – from dealers who caught endangered animals in the wild, while starting to build bridges with conservation organisations. CITES sped up this rearrangement of networks as it stipulated that only animals "bred in captivity" could circulate between non-commercial zoos as long as there was evidence that they could be "maintained in a captive breeding situation for multiple generations" (Duplaix 2022). Zoo practitioners immediately realised this would limit "the availability of animals in international trade" (Farst 1979: 80, 82). By complicating access to rare wild-caught animals, CITES, thus, made collaborative breeding programs a survival strategy for zoos, while helping them to transform their public image from "consumers" to "saviors" of endangered species (Bayma 2012: 129–30; Hanson 2004: 166–8; Penn et al. 2012: 62–79; Pouillard 2019: 382–3).

The changing relation between governments, zoo organisations, and dealers (sped up by CITES) reshaped and redefined the activities of all these social groups. While animal dealers continued at least part of their work, they certainly became less visible in the activities of "scientific" zoos that presented conservation as crucial to their mission (Graham 1987: 646). Simultaneously, governmental control drove some trade of exotic animals underground. Yet, helped by the fact that initially only a limited number of nations ratified CITES, dealers could rearrange trade routes of endangered animals by diverting shipments between ratifying countries via non-complying nations, evading control (Duplaix and Grady 1980: 172). The introduction of CITES, furthermore, changed the activities of custom officials. For some time, the latter struggled to acquire the taxonomic skill to recognise the various species of the (ever-changing) CITES appendices (Linhart et al. 2008). To mitigate the problem, the Conference of the Parties eventually developed "identification manuals" showing pictures of the most smuggled species (Wijnstekers 2001: 474). The actor-network constructed around CITES gradually expanded its scale, but it also continuously proved to be precarious. Inventiveness on the side of dealers, or lack of taxonomic skill on the side of custom officials, could make it all unstuck.

Apart from humans, material things were crucial for the functioning of the network. The aforementioned identification manual provides only one of the many examples. In fact, the manual could only "play its part" in relation to various other technologies of control. Many of those technologies involved paperwork, most notably of import and export permits. Those permits could, for instance, indicate that the transported animals were captive-bred, which then required proof through other (paper) certificates (Versteege 2021). Of course, this system of control was not static, but evolved over time. Gradually, it was streamlined, standardised, and digitised. Crucial in this process was that from 1980 onward, the United Nations Environmental Program (UNEP) World Conservation Monitoring Centre launched a CITES Trade database – thus starting to act as a center of calculation (*A Guide to Using the CITES Trade Database* 2013). For zoos, standardised record-keeping of ingoing and outgoing animals was certainly no longer a novelty at that point. After all, through their renewed focus on breeding, they had already been developing their own international inventory systems since the 1970s (Braverman 2013: 110–26; Flesness 2003). Over time, CITES increasingly mapped onto these existing technologies of bookkeeping and control. Today, the non-profit organisation Species360, which runs the most widely used database for zoo animals, explicitly advertises its software as "accepted and preferred by international regulatory bodies such as CITES" (Species360: Benefits of Membership n.d.). Technologies as databases, thus, clearly exerted agency, shaping the circulation of living animals and enabling particular forms of conservation practice.

To exert control over trade, CITES officials not only mobilised databases monitoring animals from afar, but also technologies close to the actual animal bodies themselves. To link individual animals with individual certificates, they looked into all kinds of markers ranging from tags to rings, bands, tattoos, photographs, and, from the 1990s onward, microchips. These markers, of which CITES would single out the closed feet-ring and the microchip as the most trustworthy ones, were crucial to the functioning of the network, but also came with new forms of precariousness. Individual governments in charge of enforcement differed in terms of the types of markings they allowed. Manufacturers, furthermore, added to the complexity by marketing different and incompatible technologies of microchips and scanners ("CITES, Eleventh meeting of the Conference of the Parties, Gigiri (Kenya)" 2000). Simultaneously, illegal traders found ways around the identification systems. In 1998, the CITES Animal Committee discussed how fraudsters re-programmed microchips (Summary Records, CITES Animals Committee, 14th Meeting 1998), and a 2007 report highlighted that some traders removed rings from dead birds, putting them around the legs of wild-caught chicks (Knapp and Affre 2007: 8). All this pushed CITES administrators towards continuous adaptation, further negotiation, and standardisation. This was crucial work. Purpose-made rings and microchips, after all, established important links in CITES's actor-network by tying individual animal bodies to bookkeeping technologies, and thus enhancing the long-distance power of the technologies' owners.

Interestingly, in developing animal markers, the members of the Conference of the Parties took into account not only the logic of governments, manufacturers, and fraudsters, but also the "physical or behavioural characteristics" of the animals themselves (Marking and Labelling n.d.). Microchipping and scanning microchips proved complicated with dangerous animals such as large carnivores. Moreover, heavily traded juvenile tortoises were for a long time seen as unsuited for marking by either rings or microchips, as were many small animals such as amphibians and invertebrates (Knapp and Affre 2007: 7, 22; Versteege 2021). When too small or aggressive, animals proved hard to be inscribed in CITES's assemblage.

Animal actors mattered in other respects, too. In their response to CITES, zoos might have foregrounded their mission to breed endangered animals, but not all species proved equally susceptible to such a vision. In the 1970s, the proportion of zoo-born animals within the overall population did rise significantly, but certainly not for all threatened species to the same extent. The Arabian oryx and golden lion tamarin were early successes, but gorillas – with their low birth rate – proved problematic (Duplaix and Grady 1980: 174–6). Overall, there are indications that, during the following decades, breeding difficulties in combination with CITES's legislation actually led to a decrease in species numbers in the average zoo (Brereton and Brereton 2020: 142). Animal procreation in captivity, thus, partially set the pace of post-CITES zoo trade.

Indeed, some animals almost seemed impossible to fit in the rationale of zoos as breeding institutions. African elephants offer a case in point. Breeding with the species in zoos is notoriously difficult, which is associated with the short oestrus of females, the limited access to males, and the lack of social structures of larger groups in a zoo context. Infant mortality is generally high and life expectancy low, with most zoos seemingly unable to provide the space and group size African elephants need for healthy lives (Hartley and Stanley 2016). Yet, with African elephants listed as Appendix II species in four southern African countries, CITES continued to allow for their export to "appropriate and acceptable destinations". Between 1990 and 2015, zoos (most of them in China and the United States) still imported 331 wild-caught African elephants (Challenges to CITES Regulation of the International Trade in Live, Wild-Caught African Elephants 2017: 8). Yet, after much debate, the CITES Conference of the Parties of 2019 voted a resolution stipulating that the only "appropriate and acceptable destinations" for African elephants are within their natural habitat ("Eighteenth Meeting of the Conference of the Parties Geneva (Switzerland)" 2019: 3). Of course, the lobby work of NGOs was crucial for this outcome, but equally so was the behaviour and physiology of African elephants that proved highly difficult to be integrated into the logic of captive breeding.

The recent resolution on trade in African elephants shows once again how the actor-network around CITES is dynamic and has mobilised shifting coalitions of agents. The convention's performative power in zoos was shaped by governments, zoo associations, dealers, custom officials, manuals, databases, microchips, and the physical and behavioural characteristics of golden lion tamarins and African elephants. The mutual relations between all these agents have continuously changed. New ratifications have shut (some) loopholes for traders. Identification manuals have provided custom officials with new instruments. Increasingly, small microchips enable use in more taxonomic groups, while biotechnological innovations alter possibilities of captive breeding. Laws, technologies and bodies are thus re-assembled in ever-new constellations. Consequently, CITES today is no longer what it was in 1973. While initially only tying together a few negotiators in a boardroom, CITES ended up connecting a wide range of humans, things, and non-human organisms in a world-spanning yet unstable network.

AEWA and the protection of flyways

Our second case is the AEWA and the new types of alliances and relationships that ornithologists and conservationists forged during and after the introduction of the international agreement on migratory waterbirds. For the AEWA, too, we show that conventions are heterogeneous and at times precarious assemblages that depend on the enrolment and mobilisation of human and non-human allies. The AEWA falls under the Convention on Migratory Species (CMS) framework, first signed in 1979, which has its seat in Bonn, Germany, and is administered by the UNEP. Unlike CITES, the AEWA, which was ratified in 1985 and entered into force in 1999, is not concerned with the capture and transportation of animals by human actors. Rather, it focuses on birds that, in their annual migration, cover vast distances on their own. The AEWA tries to guarantee their protection from landscape development, hunting, and obstructions on their migratory routes. The agreement's geographical focus is on the Western Palearctic Flyway, the route taken by a vast number of birds breeding in Europe and Russia when migrating southward and westward during the European winter months. Similar to CITES, the protection of migratory waterbirds required the enrolment of a range of different actors, including policymakers and researchers in various range states as well as international organisations, and technologies for tracking and recording animal movement and endangerment. Again – as we will show – animal agents played a crucial role in the formation and practical implementation of the legal text.

Like all CMS agreements, the AEWA focuses on the protection of border-crossing species. Similar to CITES, both the CMS and the AEWA work with appendices that classify particular species under the convention as either "threatened" (Appendix I) or "with unfavourable conservation status", requiring additional international agreements for their protection (Appendix II) (Baldwin 2011: 539–40). This focus on species differentiates the CMS and the AWEA from other conservation conventions, such as the Ramsar Convention on Wetlands (1971), the European Birds Directive (1979), or the Habitats Directive (2000), which are traditionally concerned with the protection of habitats, marshes, and coastal regions in particular. Even within the framework of the CMS, the AEWA takes a special position. While most CMS daughter agreements are concerned with one or two species, the AEWA in theory covers all species of waterbirds migrating along the Western Palearctic Flyway. With more than 60 parties, it is one of the largest CMS agreements and is often considered an example of best practice. Like the CMS, the AEWA, although legally binding, has no strict monitoring or enforcement mechanisms, and the success of the agreement depends on the participating parties. Nevertheless, a commitment to the AEWA framework generally results in expectations and – if necessary – peer pressure for compliance (Lewis 2016; Remmelts 2021; Trouwborst 2012).

While the AEWA is a relatively recent instrument, calls to protect migratory waterbirds preceded the agreement by several decades. An emerging network for migratory bird protection first enrolled ornithologists concerned with the fate of charismatic European bird species, for instance white storks and large waterfowl. In the postwar decades, censuses on the breeding populations of white storks in several central European countries indicated that

European stork populations had drastically declined. Already during the 1950s and 1960s, at the so-called MAR conferences, international organisations such as the IUCN, the International Council for Bird Preservation (ICBP), and the International Waterfowl and Wetlands Research Bureau (IWRB) concerned themselves with the vulnerability of waterbirds and their dependency on networks of wetlands along their migratory routes (IUCN 1964). Later, the Ramsar Convention (which grew out of these concerns over declining waterbird numbers) also addressed the need for additional international cooperation, but its scope was limited to wetlands, and thus to particular sites, including in border regions (Lewis 2016). In the 1970s, leading bird conservationists such as the German ornithologist Eugeniusz Nowak demanded an extension of existing international cooperation in waterbird protection efforts (Nowak 1979). Despite these calls for international alliances beyond the European community, the early proposals for what would become the AEWA originated as a European initiative. In 1985, the CMS's first Conference of Parties of mainly European signatories published a resolution to protect four groups of animals: European bats; white storks; Western Palearctic Anatidae (ducks, geese, and swans), to a large extent breeding in Europe; and two types of European dolphins (Secretariat of the Convention 1985: 50). By 1994, resolutions on two of these groups, Anatidae and white storks, formed the basis for what would become the AEWA.

As in the case of CITES, the enrolment of relevant social groups in the process of drafting the AEWA required extended negotiations. This becomes clear when looking at the case of Palearctic Anatidae. In the 1980s, initiatives behind the second draft agreement were led by a Working Group on Ducks and Geese (WGDG) located in the Netherlands, at the time the country with the strictest hunting policies in Europe. Unsurprisingly, the WGDG focused on hunting regulations within Europe rather than on flyway protection. When facing resistance from hunting organisations in countries with blood sports traditions, such as Italy and France, the WGDG proposed a compromise by focusing on hunting methods and types of ammunition rather than quota (Boere 2010: 35–37). Forbidding the use of lead in birdshot, which waterbirds tend to ingest, it sought to prevent lead from entering into the ecosystem's food chain up to the level of human consumers. The ducks' feeding habits here helped to reshuffle the actor-network to include the powerful actors of the European hunting lobby. The feeding habits in question enabled a policy focus on "sustainable hunting" – excluding the use of lead, but allowing for a continued shooting of certain species if not endangered. In this way, the WGDG and later the AEWA could draw on the support of the European Federation for Hunting and Conservation (FACE) in educational campaigns and policy promotion (European Commission n.d.; UNEP/AEWA Secretariat 2009: 4).

With AEWA, as with CITES, a multitude of non-human, too, allies shaped the composition and branching out of the convention as a network. The geographical focus of early proposals resulted from the availability of data on Palearctic migrants breeding in European countries with strong ornithological traditions (Boere 2010: 10; IUCN 1983: 10). In the 1990s, Europe constituted the centre from which AEWA's actor-network would expand by following the migrating birds it sought to protect. The emerging scope of the network was influenced by developments in the European research landscape, including the appropriation of foreign scientific concepts and the use of new technologies. The concept of the flyway, for instance, had emerged in the 1930s as an approach to understand and protect American shorebirds (Wilson 2010). In the 1970s, the concept was gaining traction among European ornithologists, concerned, for instance, with the mapping of migratory routes of waders, which had previously been understood as annually variable (Morrison 1977).

The appropriation of the flyway concept was stimulated by advances in tracking technologies such as electronic telemetry and new ways of organising banding. While traditional research methods such as observation still play an important role in the fieldwork underlying the AEWA, advances in tracking technology and their promises of precision functioned as important instruments for control and accounting in the actor-network of AEWA.

In the 1970s, the establishment of a European database for ring data by the European Union for Bird Ringing (EURING) triggered the standardisation of ring records and created a new center of calculation. In 1977, an attempt was made to computerise historical data going back to the 1920s, and, in 1982, these efforts were further advanced with additional funding by the European Community (du Feu et al. 2016). EURING has hence played a key role in the compiling of bird migration atlases that support flyway protection as pursued under the AEWA (Baillie et al. 2018). The 1980s and 1990s, then, witnessed the rise of bird tracking by transmitter, from the ground, by truck or plane, and eventually by satellite. Transmitters had previously only been used in wildlife research on larger mammals. While manual marking with tags and rings allowed for a general apprehension of large-scale animal movements, electronic telemetry enabled a more detailed understanding of migratory routes, including individual and annual variations. The development of smaller and lighter tracking devices with stronger batteries in the 1980s and 1990s supported the continuous tracking of individual birds across continents, aiding research into the choice of particular stopover sites, relevant to an instrument such as the AEWA, which aims to respect the migration needs of 255 different species (Benson 2010; Nowak and Berthold 1987). In the 1980s and early 1990s, white stork research with transmitters in the framework of the CMS, coordinated by the EEG and ICBP, resulted in an extension of the emerging AEWA area to include the southern half of the African continent, which lay outside the scope of existing conventions on European birds and wetlands.

But not only did new tracking technology aid the understanding of different bird species' flyways and the perceived need for their protection. Conversely, the CMS's dynamic framework also shaped the part played by technologies of control within the emergent alliance. Ornithologists at the German Max Planck Institute for Ornithology, for instance, perceived proposals for bird migration studies in the context of the CMS and its daughter agreements

Figure 10.2 A northern gannet with transmitter. Up to today, larger, popular birds such as gannets and godwits are fitted with transmitters more often. Wald1siedel. 2015. Ringed Northern Gannet with GPS Transmitter, Helgoland, Cliff. Wikimedia commons. CC-BY-SA-4.0.

as an opportunity to modernise their technological equipment and to manifest their expert standing (Berthold 1987). New technologies resulted in the enrolment of additional actors. While the ornithological community largely controlled bird ringing, telemetry led to new relations with commercial actors, such as Collective Localisation Satellites (CLS), the international company controlling the environmental surveillance satellite system Argos (Benson 2012).

In the case of the AEWA, too, the role of technologies brings to light not only the changing nature of the alliance, but also the precariousness of the assemblage. Especially in the early years of the CMS, telemetry held many promises. The technology was considered more efficient and precise than traditional banding. Accumulating sufficient banding data for accurate flyway atlases and for the enlisting of relevant range states could take up to a decade, as it did in the case of the brant goose (Boere 2010). Yet, despite its perceived advantages, the development of electronic tracking was inhibited by high costs and delays in the launch of European research satellites, for instance, after the Challenger disaster of 1986 (Keller and Schiewe 1990). Transmitters, moreover, are work-intensive and less versatile. While banding is often done on nestlings, expensive electronic transmitters are fitted to older birds that have a higher survival rate. Older birds are, however, more difficult to catch and release. With small species, such as warblers or small ducks, transmitters remain too large to be used (Fast et al. 2011; Fiedler 2011). Overall, the migratory routes of larger waterbirds are most closely monitored, and protection efforts are most thoroughly based on scientific research. The migration of the black-tailed godwit, a popular shorebird in the Netherlands, is one example here (Remmelts 2021). Yet, for the study of most birds and their stays outside of Europe, banding data or simple ground observation with binoculars continue to play an important role in the composition of flyway atlases.

Next to technologies, and just like in the case of CITES, animals themselves mattered for the effectiveness of the AEWA. In this case, the migration habits of the birds, their abundance, and toleration of being caught and counted are key. To make it into the AEWA appendices, species must be threatened, yet not too difficult to locate, too rare, or too shy to ring or track. The latter is the case, for instance, for the endangered aquatic warbler, a small beige bird with a heavily striped back that breeds in wet sedge meadows in an area ranging from Eastern Germany to Romania. The bird, with its own Memorandum of Understanding under the CMS, used to be widespread all over Europe. Small, and difficult to spot and catch, the warbler's electronic tracking or systematic ringing is virtually impossible. With surveys relying on observations and recordings of bird songs, uncertainties about the numbers of breeding areas and the locations of stopover and wintering sites present a continuous problem (Remmelts 2021; Tanneberger et al. 2005; UNEP/AEWA Secretariat 2018).

In the future, it is expected that global heating-induced changes in bird behaviour and migration, paired with intensified land use in both breeding and "wintering" areas, will significantly affect the AEWA's scope and effectiveness once again. Changing migration behaviour will require further adaption of flyway maps, species lists, and – to some extent – working group composition, as most migratory birds will shift into new ranges. For several bird species, especially those migrating within the African tropic zone and those depending on Arctic breeding areas and some European stopover sites including the Wadden Sea, the AEWA might provide insufficient protection (Nagy et al. 2021; Remmelts 2022; Trouwborst 2012).

The development of the AEWA as a heterogeneous network shows that legal instruments such as conventions are effective only as dynamic constellations of social action, research initiatives, technological devices, and animals themselves. The final formulation of the AEWA agreement and the continued flexibility of its lists and appendices depends on the use of tracking technologies and the availability of conservation data. At the same time, population sizes, (changing) migration routes, and research interests in particular species all play crucial roles in the continuous reconfiguration of the AEWA's assemblage. Its success indeed relies on such continuous reconfiguration.

Conclusion

In this chapter, we have approached two wildlife conventions from an actor-network approach. We have shown that this approach, which treats conventions as heterogeneous assemblages of meanings and materials, rather than as legal texts alone, is useful to understand what conventions do – allowing us to trace their performativity. This performativity is ever-changing. What conventions do, continues to change after they have been ratified. Their meaning and agency unfold through the changing, heterogeneous relationships between humans, organisations, technologies, and animals. It is here that the advantage of the actor-network approach becomes apparent. It shows how legal texts (for which such relational approaches have hardly been used) can exert influence beyond the world of paper to affect concrete animal bodies. Other case studies could, of course, extend the approach to regulations on local ecologies, regional infrastructures, or the global climate – highlighting the way in which legislation is networked with the natural and the material world.

The two conventions discussed in this chapter administer the long-distance movement of animals beyond political borders. The scope of the actor-networks of the two conventions partially maps onto the type of movement they aim to regulate. CITES, regulating the movement of wildlife, needed a network involving wildlife-producing nations, often in the Global South, and wildlife consuming nations, in the Global North. CITES's actor-network, however, not just mapped on to that of the wildlife trade but also redrew it. It was instrumental in establishing new connections between zoological gardens and (unintentionally) creating new smuggling routes through non-complying nations. The AEWA, concerned with creating safe passage for migratory waterbirds along the Western Palearctic Flyway, connected range states between European and Asian breeding areas and seasonal resting areas on the African continent. The flyways involved, and thus the relevant range states, changed, however, depending on the condition of a species and conservationists' ability to understand it.

The emerging and changing relationships underlying these long-distance connections and the scale of the conventions were not easily established. An actor-network approach helps to recognise the work that goes into the tracking, mapping, and monitoring of animal movements, as well as into the obstacles that need to be overcome. The approach, moreover, brings to light that the relationships within the network are often unequal. For both CITES and AEWA, the administration of animal movement was aided by emerging "centres of calculation" that helped control and discipline the movement of animals. In the cases at hand, these centres were located in the Global North, within the headquarters of international organisations, such as the IUCN, or financed by European funds, as in the case of EURING. Of course, discussions of power imbalances are not absent from conventional histories of environmental treaties. However, an actor-network approach allows us to understand power dynamics within assemblages as continuously negotiated and determined by a multitude of human and non-human actors.

In fact, despite regulatory attempts by dominant actors, animal movements, whether they concern migrations or trade, remain unruly. In addition to revealing power dynamics and persisting imbalances, analysing conventions as actor-networks makes visible the precariousness of conventions as assemblages, as in the case of non-complying dealers and uncommitted range states, incompatible chipping technologies and insufficient flyway data, non-reproductive elephants and shy warblers. Again, it becomes apparent how important it is to look beyond the world of legal texts and the human actors involved in drafting them.

Overall, the actor-network approach is well suited for studying wildlife conventions from an environmental history perspective. A central aim of much of the current discipline of environmental history and neighbouring fields in the environmental humanities is to highlight the (historical) agency of *more-than-human actors* (Haraway 2007; O'Gorman and Gaynor 2020). While it might be tempting to write about environmental conventions as primarily products of political negotiations between humans concerned with protecting other species and environments, ANT invites us to rethink such unidirectional narratives. ANT refocuses the attention on the dynamic and multiform relations between various entities, including lobby groups and laws, manuals and trackers, golden lion tamarins and geese. It is through these relations that treaties and environments are made and unmade. As such, the approach acknowledges the unruly texture of environmental jurisdiction as part of collective, co-created, and always precarious processes, depending on both humans and non-humans playing their part.

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