

## Cities and the Transformation of Biodiversity Governance

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### 14.1 Introduction

The governing of nature has been an essential part of the story of urbanization. Whether through the conversion of rivers for transportation, the creation of urban drainage systems for wastewater removal or the installation of parks for their recreational and aesthetic value (Gandy, 2004; Gleeson and Low, 2000; Rydin, 1998), nature has played a critical role in urban development. Yet, conservationist thinking, which has dominated environmental governance and policy, has tended to equate the environment as belonging to either “rural” or “wilderness” places that needed to be protected from the encroachment of (urban) society (Owens, 1992). As a result, much of the governance of biodiversity at the urban scale during the twentieth century was focused on the designation and enforcement of protected areas (Vaccaro et al., 2013). Yet such dualistic thinking has ignored the ways in which nature inhabits the city, whether intended or otherwise, from domestic gardens to public parks, urban sewers to derelict corners of the city, as well as the potential benefits that such forms of biodiversity can bring to the city.

It has only been since the late 1980s that how cities might contribute toward local, national and global sustainability has begun to be recognized. While climate change has tended to dominate this agenda, cities also have a range of different yet substantial roles in addressing the loss of nature: as habitats for biodiversity and threatened species (Aronson et al., 2014; Hall et al., 2017; Ives et al., 2016; Soanes and Lentini, 2019); as locations for people to connect with nature (Soanes and Lentini, 2019); as key jurisdictions in global and multilevel governance (Pattberg et al., 2019) and as important consumption arenas driving biodiversity loss globally (Díaz et al., 2019). Nonetheless, it was not until 2008 that the first *Global Biodiversity Summits of Local and Subnational Governments* was held in parallel to the Conference of the Parties to the Convention on Biological Diversity. These summits have since taken place biannually and are intended as a means through which to reinforce the recognition and involvement of local and subnational governments in contributing to CBD objectives and targets. While the initial version of both the *Strategic Plan for Biodiversity 2011–2020* and the *20 Aichi Biodiversity Targets* makes no direct references to cities or urban areas, a subsequent assessment of the Aichi targets and the 2030 Agenda for Sustainable Development found that Sustainable Development Goal 11 on Sustainable Cities and Communities corresponded to six (2, 4, 8, 11, 14 and 15) of the Aichi targets

(CBD, 2016). At the same time, the 2010 Decision X/22 of the Convention on Biodiversity laid out explicit terms on which the Parties to the convention were to be encouraged to recognize and facilitate the work of subnational and local authorities through the development and implementation of local biodiversity strategies and action plans (LBSAPs). Over the past decade, the urban dimension of biodiversity issues has come to be increasingly recognized.

Yet despite this, in practice biodiversity governance has yet to gain widespread traction at the local level, and local biodiversity planning has been critiqued for an overly narrow approach, the exclusion of diverse values for nature and limited effectiveness (Bomans et al., 2010; Elander et al., 2005; Evans, 2004; Wilkinson et al., 2013). In this chapter, we explore how the governance of urban nature is evolving in response to the increasing urgency of this agenda. In so doing, we follow the distinction put forward by Patterson et al. (2017) and highlighted in Chapter 1 between governance *for* transformation, where governance creates the conditions by which transformative change can emerge; governance *of* transformations, where governance is deliberately intended to advance transformative change in terms of either processes or outcomes that involve systemic or structural shifts in current socioecological orders; and transformations *in* governance, where governance regimes – their architectures, agency, power and so forth – are themselves transformed. We find that, internationally, urban biodiversity governance is being transformed both in terms of its intentions (governance *for* transformation) – moving from a concern only with reducing the threat of cities to biodiversity to also realizing their benefits (Section 14.2) – and in terms of the forms that governance is taking (transformation *in* governance) – through the growth of governance experimentation in cities and the growth in transnational governance networks (Section 14.3). These shifts are changing the *outcomes* of what biodiversity governance in the city is seeking to realize – from a focus on specific places and parts of nature to a broader engagement with multiple socio-natures and the ways in which working with nature can generate sustainability benefits for a diverse range of communities. At the same time, within urban policymaking and practice on the ground, there has yet to be a significant effort to address the ways in which cities contribute to the underlying drivers of biodiversity loss through explicitly linking their roles and responsibilities in reducing waste, combating climate change and shaping production and consumption with biodiversity agendas. We return to these points in conclusion (Section 14.4) and reflect on their implications for the ways in which cities can contribute to transformative biodiversity governance.

## 14.2 Transforming Biodiversity in the City: from Threat to Opportunity?

If, for the most part of modern urban development, cities were regarded as separated from nature, the global environmental challenges facing society in the twenty-first century have abruptly erased any such boundaries. As the IPBES Global Assessment makes clear, cities are a primary driver of biodiversity loss through urban expansion and pollution, as well as affecting the loss of nature globally through the consumption practices of urban residents

and the global value chains of urban economies. The detailed analysis presented in the *Nature in the Urban Century* report (McDonald et al., 2018) asserts that urban growth was responsible for the loss of 190,000 km<sup>2</sup> of natural habitat between 1992 and 2000 and could threaten 290,000 km<sup>2</sup> of global natural habitat by 2030. Cities located in globally important biodiversity hotspots bear special significance in this context. Biodiversity hotspots are areas of exceptional concentrations of endemic species that are simultaneously undergoing a high rate of loss of habitat. It was estimated that in 1995, 20 percent of the world's population was living in global biodiversity hotspots, which accounts for about 12 percent of the earth's surface. Population growth in these hotspots was estimated to be 1.8 percent per annum (Cincotta et al., 2000).<sup>1</sup> Such impacts are not only felt in areas with particular biodiversity value: urbanization and increased impervious surfaces are also having severe impacts on urban wetlands and waterways (Booth et al., 2016). In short, even though the impact of individual cities will be highly varied, the weight of evidence suggests that urbanization processes are “catastrophic for native species, and . . . a well-known threat to biodiversity worldwide” (Garrard et al., 2017: 1).

For the most part, it has been this discourse of the in-situ impacts of urbanization on biodiversity either within the city boundary or at its expanding edge that has shaped how the potential role of cities in governing biodiversity has been framed (Bulkeley et al., 2021). Over the past decade, the Convention on Biodiversity has primarily focused on the spatial planning capacities of cities as essential to managing urban encroachment on biodiversity and on the importance of protected areas for biodiversity conservation. Yet this underplays two other important ways in which cities are connected to the biodiversity challenge. First, as the IPBES Global Assessment makes clear, cities have a significant role in shaping the drivers of biodiversity loss – from climate change to consumption. Second, as urbanists have long recognized, cities are intricately connected to and dependent on nature – from water resources to urban parks (Gandy, 2002; Swyngedouw and Kaika, 2000). There is now a growing interest in the ways in which cities can benefit from both the ecosystem services that nature provides and also how urban nature and biodiversity contribute to less readily quantified values, such as heritage, well-being, stewardship and reverence, and provide an essential form of connection between nature and people in the urban milieu. Urban nature is increasingly recognized for its capacity to not only support biodiversity conservation, but also to generate additional environmental, economic and social benefits – or what are termed “nature's contribution to people” (Kabisch et al., 2016). This is reflected in a growing interest in urban nature-based solutions, an umbrella term used to encompass ecosystem-based adaptation (Geneletti and Zardo, 2016; Munang et al., 2013), green infrastructure and ecosystem services (Cohen-Shacham et al., 2016; Dorst et al., 2019; Nesshöver et al., 2017; Pauleit et al., 2017). Nature-based solutions provide a means through which cities not only have the potential to benefit directly from nature, but also contribute to addressing the global challenge of the loss of biodiversity. In the rest of this

<sup>1</sup> Urbanization does not only form a threat to nature because of the conversion of nature into built environment and because of the effects on surrounding nature areas (e.g. traffic, recreation, etc.), however. Nature *within* cities is also threatened because of competing land claims. For instance, the “compact city” paradigm and other densification strategies – aimed at preserving nature outside cities – can endanger space for nature in cities (Fischer et al., 2018).

section, we examine how cities are currently undertaking action that can contribute to three key elements of biodiversity governance – *protecting* or conserving nature, *restoring* nature and fostering the value of nature’s contributions to people through *thriving* with nature. We suggest that there is significant evidence that cities can no longer be viewed simply as a *threat* to biodiversity, but are transforming their role to one of significant *opportunity*. In doing so, they are adopting new means of governing nature in the city, which in turn are leading to the transformation of biodiversity governance within and beyond its boundaries.

#### 14.2.1 Urban Biodiversity Conservation

The main goal of conservation is to prevent further loss and degradation of natural ecosystems and resources (Young, 2000), although in practice this can include the preservation, maintenance, sustainable use and enhancement of the components of biological diversity as well as exploring how society lives in harmony with nature. Although cities have been seen to hold little conservation value, there is increasing recognition of the role that urban green spaces, waterways and wetlands play in conservation, and its wider contributions to human health and well-being (Aronson et al., 2014; Endreny et al., 2017; Parris et al., 2018). Cities also provide habitat for threatened species, and some threatened species are found exclusively in urban areas (Soanes and Lentini, 2019). Ives et al. (2016: 117) analyzed the distribution of Australia’s listed threatened species and found that 30 percent are found in cities and that “Australian cities support substantially more nationally threatened animal and plant species than all other non-urban areas on a unit-area basis.” Globally, while a large number of species have been disadvantaged or made locally extinct by urbanization, urban areas have also provided range expansions for other species, including fruit-eating bats (Williams et al., 2006) and nectar-feeding birds that feast on the well-watered and productive plants found in urban gardens.

It is therefore a misconception that cities cannot contribute significantly to biodiversity conservation (Soanes et al., 2019), yet even where this is recognized, there is significant debate concerning how this contribution can be realized. As the main preference is “given to conserving large, highly connected areas,” “relative ambivalence [is] shown toward protecting small, isolated habitat patches” even though they are “inordinately important for biodiversity conservation” (Wintle et al., 2019: 909). Far from being delivered through systematic forms of urban (biodiversity) planning, urban reserve or park systems are often small, fragmented and disconnected, located on leftover, undevelopable land or squeezed in size due to urban development pressures and economic imperatives, but nonetheless have been shown to make important contributions to conservation (Kendal et al., 2017). While “effective conservation planning requires an understanding of species-habitat relationships” that goes beyond the simplified single species focus (Threlfall et al., 2012: 41), in urban areas the same species that may be valued as threatened species may also be labeled as pests. The grey-headed flying fox is listed as a vulnerable species in Australia, but in Melbourne, a colony of the animals was evicted from the botanic gardens for causing roosting damage to trees. Black-legged kittiwakes, a threatened gull species that nest and

breed in areas along the quayside in Newcastle, UK, are blamed for mess and noise, such that while birdwatchers and wildlife enthusiasts celebrate their presence, local businesses are less enthusiastic and have used various means (spikes, nets, electric shocks) to attempt to prevent nesting. At the same time, as cities experience the impacts of climate change, what it is appropriate to conserve is also coming into question as much-loved and threatened urban species may not be able to flourish under changing conditions (Lennon, 2015; Prober et al., 2019). These complexities point to the challenges of governing biodiversity in human-dominated landscapes, suggesting that the forms of nature that are or are not valued cannot be established through scientific knowledge but, as the Introduction to this volume suggests, require the bringing together of diverse forms of knowledge often in a transdisciplinary manner.

Governing for urban conservation is therefore no straightforward matter, but rather shot through with contention over which kinds of nature should be conserved, for whom and under which conditions. The importance of fragmented urban nature and small, disconnected spaces in cities for biodiversity conservation also suggests that addressing biodiversity goals involves multiple sites and actors that are not directly engaged in the formal land-use planning or regulatory systems of local authorities. Indeed, as we discuss further below, it appears that urban conservation governance is being transformed – rather than being led by urban planning, it is now taking place through a whole host of initiatives and programs, including those conceived as nature-based solutions to diverse sustainability challenges, that are undertaken by a range of urban actors, including private and civil society organizations. In this context, rather than requiring more integrated governance, as Chapter 1 suggests, fragmented and diverse forms of governance are potentially a more viable means through which to transform the capacity of cities to address the loss of nature.

### ***14.2.2 Urban Biodiversity Restoration***

While conservation mainly focuses on preventing ongoing and future losses, restoration seeks to actively reverse such degradation (Garson, 2016). Similar to conservation activities, restoration activities differ greatly in their spatial scale and in terms of the sheer magnitude of intervention they entail (Garson, 2016). With cities' roles in biodiversity conservation being increasingly recognized, more attention is also being directed toward the restoration of urban green spaces for biodiversity habitat (Butt et al., 2018). Restoration activities have focused on habitat improvement and planting; creating artificial structures for nesting, shelter or to facilitate faunal movement and connectivity between sites; control of pest or invasive species; and community engagement and education programs, including citizen science and site or species monitoring programs (Threlfall et al., 2019). Green spaces that include understory cover and increased structural complexity of vegetation have been shown to improve biodiversity outcomes, and therefore restoration efforts that “redress the dominance of simplified and exotic vegetation . . . with an increase in understory vegetation volume and percentage of native vegetation will benefit a broad array of biodiversity” (Threlfall et al., 2017: 1874). Furthermore, with studies showing the “inordinately

important” contribution of small, isolated habitat patches for biodiversity conservation, the restoration of these small patches of urban green space, wetlands and waterways should be “urgently prioritised” (Wintle et al., 2019: 909). This in turn implies a model of governance that extends beyond the capacities of local governments to include a host of actors who own and manage urban land and water systems.

Cities allow for a diversity of restored habitats that serve to improve conditions for biodiversity in public and private lands (Aronson et al., 2017). For example, practices such as the restoration of native prairie vegetation along roadsides has been shown to increase bee species richness (Hopwood, 2008). Moreover, urban green and blue spaces are being increasingly recognized for their capacity to not only support biodiversity conservation (Dunn et al., 2006; Goddard et al., 2010; Miller and Hobbs, 2002; Niemela, 1999), but also to generate additional environmental, social-cultural, and economic benefits, including managing water quality, fostering community inclusion and generating new opportunities for business (Haase et al., 2013; Kabisch et al., 2015), as well as fostering the functioning of ecosystems for climate change mitigation and adaptation (European Commission, 2015). The restoration of Merri Creek, a waterway in Melbourne, Australia, has seen the return of a range of species, including birds such as the sacred kingfisher, and pollution-sensitive insects to restored wetlands beside the creek (Bush et al., 2003; McGregor and McGregor, 2020). The restoration has provided many opportunities for community involvement in replanting, rubbish collection and so on, underpinning a remarkable community reconnection with the creek and a renewed sense of shared ownership (Bush et al., 2003). In the Netherlands, many citizen grassroots initiatives around urban nature exist, but their contribution to restoration in a classical sense (i.e. conserving rare/Red list species) is limited, not only because of their spatial scale but also because their objectives in terms of social, economic and environmental outcomes are not always aligned with such outcomes (Mattijssen et al., 2018). While restoration efforts have focused on public land, there is an increasing recognition of the potential contribution of greening the private realm. The City of Melbourne has recently joined a number of other cities, including Seattle, Helsinki and Malmo, in establishing a “Green Factor Tool” to encourage the integration of greening in new buildings and developments by private developers (Bush et al., 2021; City of Melbourne, 2017).

However, restoring urban habitat brings to the fore the potential for increasing conflicts between humans and nonhumans in these urban “shared habitats.” For example, in an Australian urban creek restoration project, neighboring residents viewed the return of native birds and lizards either neutrally or favorably, but there were fears about the return of snakes, which created conflict (Maller and Farahani, 2018). In another case, we can see that while water-sensitive urban design treatments to address urban issues of flooding and stormwater management can enhance biodiversity (Parris et al., 2018), they may contain high levels of contaminants, including pesticides and heavy metals from stormwater runoff, which can potentially endanger water quality for human use (Sievers et al., 2019). At the same time, what counts as “restoration” is also continually a matter of negotiation and contestation. Global environmental change poses challenges to traditional practices of “restoring ‘degraded’ ecosystems to a ‘natural state’ of acceptable historic variability”

(Lennon, 2015) such that the end goals of restoration are far from clearly determined by science alone. Further, “novel ecosystems,” which are composed of “non-historical species configurations” and dominate many urban landscapes, are rarely considered as worthy of either conservation or restoration, despite providing rich species assemblages and biodiversity habitat (Planchuelo et al., 2019).

As with the governing of urban biodiversity conservation, interventions and practices aimed at enabling the restoration of urban nature for biodiversity is fraught with conflicts, indeterminacy and the potential for exclusionary processes that revere some forms of nature at the expense of others (Tozer et al., 2020). While questions of the design and implementation of such schemes have been debated, there has been less consideration of “new principles that can help guide goal-setting for nature conservation and ecological restoration in dynamic environments” (Prober et al., 2017: 477), particularly in the face of climate change (Prober et al., 2019). Indigenous people’s perspectives and knowledge, which have critical contributions for connecting past, present and future natural and cultural heritage, must be embedded in these debates for new principles as well as broader planning and implementation of conservation and restoration activities. Indigenous knowledge and perspectives are “crucial for long-term, sustained biodiversity conservation, land and water management” (Threlfall et al., 2019: 3). As has been found with conservation initiatives, recognizing the key role that restoration in cities can play toward realizing global biodiversity goals also suggests that multiple actors and modes of governing beyond traditional forms of land-use planning and regulation will need to be harnessed if its potential is to be realized. While this may take place through the development of more inclusive forms of governance, we suggest it will also involve forms of protest, contestation and conflict over whose nature should be conserved or restored.

### 14.2.3 *Thriving with Urban Biodiversity*

As the IPBES Global Assessment makes clear, in addition to seeking to conserve and restore nature, a central concern for biodiversity governance in the coming decade will be to ensure that nature’s contribution to people is preserved and enhanced (Díaz et al., 2019). In short, to ensure that cities can *thrive* with nature. How, why and with what consequence it is possible to consider nature as generating a contribution to individuals and to society has been subject to intense debate, as scholars, activists and policy-makers take issue with the extent to which such contributions are framed as instrumental – a means to a human end – or as ensuing from a sense of connection, spirituality or well-being derived from knowing and being in nature (Gavin et al., 2018; Pascual et al., 2017). Attempts to identify so-called ecosystem services that contribute to societal needs and to calculate their monetary value have in particular been subject to a strong critique that doing so reduces the actual contribution that nature makes to society to a narrow range of attributes and functions that can be captured in this way (Schröter et al., 2014). Recent years have witnessed something of a move away from this position to a recognition of the multiple ways in which nature contributes toward

society, as well as the continued importance of recognizing the intrinsic value of nature itself (Díaz et al., 2018).

This shift in conceiving of nature as providing singular and functional benefits for society to a position in which the multiplicity of nature's contributions is recognized can also be witnessed at the urban level. The growth and increasing prominence of the discourse of nature-based solutions, particularly in the European Union, draws explicitly on the idea that nature can contribute to addressing the challenges facing cities, for example in terms of air or water quality, while at the same time generating a wide range of benefits, such as flourishing biodiversity and enhanced well-being, that are not so readily captured in functional or economic terms. Despite the novelty of the term, it is clear that historically urban nature has played these multiple roles, offering a means through which cities could function more effectively but also creating more or less formalized spaces of connection, solidarity and spirituality for diverse communities. In Victorian Britain, for example, formalized parks were seen to provide havens from city life for reflection and recreation. In cities that experienced colonization, Indigenous communities continued to maintain and fight for rights in order to continue to access both food resources and their cultural and spiritual connections to land and water.

As cities now seek to realize diverse goals for urban sustainability, working with and for nature has come to play a vital role. In Tianjin, China, for example, the Ecological Wetland Park is a constructed, artificial wetland with an approximate size of 630,000 m<sup>2</sup> located in one of the largest industrial, logistics and free-trade centers of the country. Its aims are not only to enhance the environmental quality of the industrial park, but also to generate space for biodiversity, a thriving economy and enhanced social well-being. In Winnipeg, Canada, a grassroots-run neighborhood group – the Spence Neighbourhood Association – is working with Indigenous communities and local stakeholders to transform more than fifty vacant lots into edible community gardens and parks. Besides their conservation value, these urban green spaces provide important social, economic and environmental benefits. For example, in the Ogimaa Gichi Makwa Gitigaan garden, which opened in 2012, the inclusion of indigenous plants not only contributes to the conservation of local species, but also allows community members to utilize traditional knowledge while learning about horticultural practices. These examples show that cities are transforming their development approach by seeking to thrive with nature in multiple ways. Yet the multifunctionality of nature-based solutions provides both opportunities and challenges. While they are frequently asserted, the benefits, synergies and trade-offs of interventions designed to generate a contribution to society need to be better investigated (Raymond et al., 2017). Multifunctionality is also problematic in view of the organization of local governments and the private sector in specialized “silos” (Dorst et al., 2019; Kabisch et al., 2016), meaning that while in principle the idea of generating diverse contributions to society is regarded as a benefit, such interventions can lack the political champions or consistent backing required to ensure that they are taken up as part of urban development.

Understanding who benefits and how from urban nature's contribution to people is not only important from the perspective of their uptake, but also in relation to their consequences. Research has documented a persistent phenomenon of green gentrification emerging in relation



to efforts to develop and enhance nature's contributions to people within cities, leading not only to forms of demographic change and displacement, but also exclusion from the very benefits that nature is supposed to generate (Anguelovski et al., 2018; Wolch et al., 2014). Such processes not only serve to reproduce and deepen urban inequalities, but also to sustain particular dominant views about which forms of nature can best contribute to society, generating elitist and often exclusionary views of what "counts" as the kinds of urban nature and biodiversity that should be conserved, restored and generated (Mattijssen et al., 2018; Tozer et al., 2020). Rather than taking for granted how nature-based solutions should intervene to contribute to biodiversity, if they are to ensure that diverse communities are to thrive with nature in the city, it is vital that the kinds of nature and biodiversity that are being generated and the auxiliary benefits they carry are subject to scrutiny by those who may need the benefits of nature most. Rather than assuming that nature and biodiversity are automatically of benefit to urban residents, it is critical that the ways in which urban nature has historically been used to repress and exclude different communities is considered in efforts to govern urban biodiversity and its wider benefits, or there is a significant risk that such interventions will contribute to, rather than transform, urban inequalities (Kuras et al., 2020). While measures to support inclusive governance, as suggested in Chapter 1, can seek to make alternative voices heard, without more fundamental changes to the structures of power within which decisions about urban futures are made, and an acknowledgment that contestation and conflict may be a necessary part of generating alternatives, inclusive governance is unlikely to be sufficient.

### **14.3 Transformative Urban Governance for Biodiversity?**

Our analysis suggests that cities are now engaged in a vast array of efforts toward conservation, restoration and thriving with nature, both through their efforts to maintain existing forms of urban nature and through the increasing focus on nature-based solutions as interventions by which to accomplish multiple sustainability goals. Urban biodiversity governance is not confined to the actions of municipal authorities, but undertaken through a wide range of interventions. In this section, we examine how urban biodiversity governance is being transformed as a result, and with what consequences for the capacity of cities to engage in the transformative governance of biodiversity. We first examine the multiple modes of governing through which cities are mobilizing their actions on biodiversity. We then turn to examine how the urban governance of biodiversity is being transformed by the growth of transnational initiatives, generating a growing "urban biodiversity complex." We suggest that these transformations in the ways in which governing biodiversity in the city are taking place each generate new forms of transformative capacity, but that this is yet to be recognized within the global biodiversity governance landscape.

#### ***14.3.1 Transforming the Modes of Governing Biodiversity in the City***

If the governance architectures envisaged by international organizations a decade ago assumed that municipal authorities might be involved in contributing to the global

governance of biodiversity through the development of LBSAPs that contribute to national biodiversity strategies and action plans (NBSAPs) and global goals (Puppim de Oliveira et al., 2014), this form of vertical alignment or integration is relatively rare, with only a fraction of national plans containing urban goals, and the majority of strategies and plans developed at the urban scale operating relatively independently of national biodiversity planning (Xie and Bulkeley, 2020). In part this is due to issues of capacity and competing demands within municipalities. Planning tools and mechanisms are often limited in their coverage of, or ability to address, biodiversity. Further, making the case to invest municipal funds into natural assets is also challenging in the face of pressing city needs such as housing and poverty alleviation. Nonetheless, using the planning system to assign protected areas within and on the borders of cities has remained popular as a model to govern urban biodiversity (Vaccaro et al., 2013). However, these governance approaches have drawn criticism for their top-down character, exclusionary stipulations and the associations of this form of governance with the control of nature (Vaccaro et al. 2013). Cities located in biodiversity hotspots face different challenges, as it appears that many of them lack planning approaches that are specifically geared toward harmonizing the need to simultaneously secure globally important biodiversity and the need to accommodate growing cities (Weller et al., 2019).

As well as being shaped by the challenges of implementing biodiversity planning on the ground, the lack of alignment or integration between global, national and local policy and planning for biodiversity is a result of the increasingly complex, fragmented and multiple forms through which urban biodiversity governing takes place. Analysis of fifty-four examples of urban nature-based solutions in eighteen cities found that no fewer than twelve different modes of governing were being deployed in order to govern urban nature, ranging from those that were wholly without the involvement of municipal or other government actors, such as those undertaken by philanthropic donors or community organizations, through to those that were wholly enacted by municipalities through their capacities to finance, build and implement infrastructure projects (Bulkeley, 2019). Across these modes of governing, the forms of regulation and land-use planning associated with traditional forms of biodiversity strategies and action plans were relatively muted, in comparison to a diverse range of governing mechanisms related to incentives, persuasion, provision, enabling and so forth. This reflects a broader phenomenon now extensively documented in the literature on urban sustainability governance, which suggests that experimentation has come to be a critical means of governing the city toward sustainability (Bulkeley, 2019; Bulkeley et al., 2014; Evans et al., 2016). As Karvonen (2018: 202) explains, “experiments might not simply serve as one-off trials to provide evidence and justification for new . . . policies, regulations, and service provision through existing circuits of policymaking and regulation. Instead, these activities are emerging as a new mode of governance in themselves.” In this view, governance by experimentation is increasingly operating alongside and indeed replacing traditional “plan-led” forms of urban governance in the face of growing fragmentation of authority and the growth of the number of actors with a stake in urban futures (Bulkeley, 2019).

Alongside the trend in the growth of biodiversity governance experimentation, analysis suggests that a specific form of intervention – nature-based solutions – is also gaining momentum (Almassy et al., 2018). The governance of nature-based solutions shows strong parallels to other forms of urban experimentation (Dorst et al., 2019), which are often characterized by participation, collaboration and learning (catalyzing local and tacit knowledge), which can contribute to inclusive, transdisciplinary and adaptive governance (Frantzeskaki, 2019; Munaretto et al., 2014; Plummer et al., 2013; Reid, 2016; Triyanti and Chu, 2018). Indeed, collaborative forms of governance dominate the design and implementation of nature-based solutions in European cities and beyond (Almassy et al., 2018; Bulkeley, 2019). While significant barriers to mainstreaming nature-based solutions remain – not least with respect to knowledge about their value and operation, the disruption they pose to existing ways of undertaking urban development, and access to finance – it is apparent that at least some forms of nature-based solutions are becoming systematically deployed. For example, as a response to changing predictions of the nature and extent of urban flooding, “sponge city” and “sustainable urban drainage” approaches are now routinely used, often creating and restoring habitat within cities and contributing to conservation goals as well as generating contributions to social well-being, health and economic development. Overall, we can suggest that the growth of urban governance experimentation is fueling the uptake of nature-based solutions, which provide forms of intervention that work across a landscape of fragmented authority and a plethora of agendas around which nature-based interventions can gather, while the multiple benefits that nature-based solutions promise serves to attract more, and more varied, actors toward governing biodiversity in the city through experimentation.

Yet despite the evident ways in which urban biodiversity governance is being transformed as a result, there is less clear evidence that urban nature-based solutions are effectively addressing issues of urban inequalities, and indeed a growing literature suggests that they could have precisely the opposite effect, casting doubt on their transformative reach. Research on the phenomenon of “green gentrification” points to the ways in which urban (re)development projects that bring nature into the city can have a significant effect on widening inequalities, displacing residents as land values and house prices rise and failing to secure access to new forms of urban nature for communities who may already suffer from multiple forms of social exclusion (Anguelovski et al., 2018; Wolch et al., 2014). For example, the now famed High-Line project in New York, while often celebrated as an economic regeneration development in the city, has also been critiqued as effectively serving the interests of business, tourists and higher income groups at the expense of the (former) residents of the neighborhood (Anguelovski et al., 2018). Equally important, efforts to bring nature into cities can serve to reproduce particular ideas about what constitutes valuable or appropriate forms of nature, failing to take account of the manifold and often contested values for nature held by diverse communities. For example, the views and values of Indigenous communities concerning the kinds of nature that should be included in urban plans are often overlooked. This suggests that the governing of urban nature can be far from transformative, serving to reproduce existing social inequalities and the systems of capitalist urban development that are in many senses responsible for driving

the loss of nature globally. On the other hand, where issues of social inclusion, the multiple values of nature and justice are taken into account, there is gathering evidence that efforts at governing urban nature can be transformative. In Winnipeg, for example, an initiative has been developed to harness Indigenous knowledge to develop community gardens in vacant lots in the city to provide space for alternative nature in the city and address issues of isolation and poor mental health among these social groups. How, by and for whom urban nature is governed is therefore critical in shaping its potential to be transformative of urban inequalities. Advocating for grassroots actions, the notion of urban nature stewardship offers opportunities for scientific and policy partnerships with local communities (Connolly et al., 2014; Krasny and Tidball, 2012), highlighting the importance of the openness and inclusiveness of urban nature governance that allows the participation of different stakeholders. Yet while such approaches can be transformative for those involved, many of the issues regarding exclusion and inequality at large remain challenging to address through such interventions. This in turn suggests that alongside any efforts at more inclusive governance, there needs to be space for dissent and contestation so that the nature of ongoing inequalities and their consequences can be made visible.

### 14.3.2 *Transnational Transformations?*

In parallel to the shift from an urban planning approach to biodiversity governance at the local level toward urban experimentation and nature-based solutions, we can see that the governance of urban biodiversity is also evolving in the international arena. First, within the Convention on Biological Diversity itself there has been a renewed commitment to the importance of urban action, notably through the development of the Edinburgh Process, through which local and subnational governments have been mandated by the Secretariat of the CBD to put forward their proposals for how the post-2020 Global Biodiversity Framework should advance and support their potential contributions. To date, this constituency has focused primarily on the need to ensure that the post-2020 Framework contains an explicit mandate for local and subnational action on the goals and targets agreed internationally, to replace the previous policy architecture agreed a decade ago. Second, and often in parallel, governance arrangements and initiatives concerned with the global governance of urban development have begun to recognize the potential value of urban nature. For example, *The New Urban Agenda*,<sup>2</sup> adopted in 2017, refers to the value of cities and human settlements that protect ecosystems and biodiversity as well as to the importance of encouraging nature-based solutions and innovations as part of urban development processes. Cross-cutting both arenas, initiatives and arrangements that are primarily concerned with the governing of climate change have increasingly signaled the potential of urban nature-based solutions as a means through which to address climate challenges as well as the biodiversity and urban sustainability agendas, for example in the report of the *Global Commission on Adaptation* and other initiatives highlighted at the 2019 UN Climate Action Summit that took place in New York (GCA and WRI, 2019;

<sup>2</sup> <https://habitat3.org/the-new-urban-agenda/>.

UNCC, 2019; UNDP, 2019). Across the UN environmental governance landscape, it is evident that the potential for urban responses to play an important role in transforming biodiversity governance is increasingly recognized.

At the same time, it is critical to recognize that the global architecture for urban biodiversity governance is not confined to the workings of international conventions, but also encompasses a range of actors and networks that operate transnationally. Of these, the first to be established (in 2006) was the Cities Biodiversity Centre, part of ICLEI Local Governments for Sustainability, who were appointed in 2019 as the representative of local and subnational governments within the CBD Secretariat. Over the past two years, ICLEI's Cities Biodiversity Centre has partnered with the newly formed IUCN Urban Alliance and The Nature Conservancy to form the CitiesWithNature platform, intended to provide a focal point for urban action toward the post-2020 biodiversity agenda. To date, 174 cities from 58 countries have committed to action under the CitiesWithNature umbrella. The involvement of the IUCN and The Nature Conservancy in such initiatives is particularly significant, marking a growing interest in urban biodiversity from organizations that have traditionally been concerned with conservation and restoration in a relatively conventional sense and for whom cities have been marginal to their interests. A similar urban biodiversity initiative was launched by the Secretariat of the Ramsar Convention in 2017 – the Wetland City Accreditation scheme.<sup>3</sup> In Europe, a number of urban projects designed to develop and implement urban nature-based solutions are being supported under the Horizon 2020 Sustainable Cities and Communities program, with a total budget of approximately 200 million Euros. These transnational initiatives primarily seek to enhance the ways in which cities are governing biodiversity within their own territories, creating a means through which both urban biodiversity planning and the increasingly diverse forms of experimentation that cities are deploying to govern biodiversity are recognized, aggregated and shared, and learning between cities is fostered. In this way, they both benefit from the fragmentation of authority to govern urban biodiversity and, through fostering new and more varied initiatives, serve to contribute toward it.

A further, if currently embryonic, trend is the emergence of transnational initiatives that are seeking to engage cities in addressing their contribution to the underlying drivers of biodiversity loss and in so doing contributing to governance *for* transformation – primarily through taking measures either to support ecosystems on which cities depend or to improve the sustainability of production and consumption. The World Resources Institute has developed the *Cities4Forests* initiative, aimed both at improving the quality and quantity of urban forest biodiversity and enhancing the role that cities play in protecting “nearby” and “faraway” forests. One of the sixty cities who have now joined this initiative, Raleigh in North Carolina, USA, has developed a water levy to pay for partnership work with upstream landowners to protect water quality in the catchment from which it draws its own water supply. As well as taking measures to protect its surrounding forest area, Kigali, Rwanda, another member of the initiative, is partnering with the Rwandan Ministry of Environment to fulfill the aim of planting trees across 43,000 hectares of land nationwide. In

<sup>3</sup> [www.ramsar.org/news/wca-applications](http://www.ramsar.org/news/wca-applications).

October 2020, twenty-six cities came together under the *European Circular Cities Declaration*, founded by The Collaborating Centre on Sustainable Consumption and Production (CSCP) together with ICLEI, the Ellen MacArthur Foundation, Eurocities, UNEP and other partners to accelerate the transition to a circular economy at the city level in order to reduce their impact on climate change and biodiversity. The long-established *C40 Cities Climate Leadership Group* is currently promoting the use of nature-based solutions to enhance building efficiency and the adaptive capacity of cities in the face of climate change, while its Food System Networks promotes regenerative urban agriculture to decrease production emissions, close yield gaps, increase food security, support local producers, decrease food miles, mitigate urban heat island effect and reduce building energy demand (through roof and wall gardens). What is notable in these initiatives is that biodiversity is often not positioned centrally to urban actions, but rather that potentially transformative forms of governing biodiversity through urban action are emerging as a “co-benefit” of urban efforts to reconfigure their economies and address climate change. Such outcomes are therefore being generated through the fragmentation, rather than integration, of governance.

There is therefore a growing density and diversity in the multilevel governance arrangements, networks, initiatives and projects through which the urban governing of biodiversity is taking shape. Taken together, the growing *governance complex* through which the governing of urban biodiversity is taking place, as well as the diversification of modes of governing through which it is being implemented, suggest that this is an arena of biodiversity governance that has been substantially transformed over the past decade. The transformation of the architectures, arrangements, networks and substance of urban nature governing, away from a specific form of urban planning concerned primarily with nature conservation and largely isolated from wider urban sustainable development and climate change goals and toward a much more fragmented, multiple and encompassing approach, not only represents a transformation in the governance dynamics at play, but has arguably also served to shift the governing of urban biodiversity on to a more transformative footing. By bringing a whole host of new actors into the realm of urban biodiversity governance and transforming both the capacities and purpose of governing biodiversity in the city, the transformation of urban biodiversity governance is arguably paving the way for a more transformative approach to biodiversity on the ground.

#### 14.4 Conclusions

Cities hold considerable potential for conserving and restoring biodiversity, and will be critical to ensuring that society can thrive by preserving and enhancing nature’s contribution to people. As we discussed in this chapter, there is now a growing realization of the importance of urban governance for nature. Of the themes of transformative governance raised in the Introduction to this book, we find most evidence of *transformations in governance* when it comes to the role of cities in biodiversity governance. First, we have argued that biodiversity governance is being transformed within cities themselves. Rather

than being confined to urban planning, we find a growth of urban experimentation as various initiatives and nature-based solutions are now being undertaken by municipal authorities and their partners, as well as a range of private and community actors, to protect, restore and thrive with nature. Second, the growing recognition of cities as key agents of change and as presenting opportunities for governing biodiversity represents a transformation in biodiversity governance internationally, which has traditionally focused on cities as a threat to biodiversity and has tended to be dominated by a focus on the nation-state. This in turn is leading to a transformation in the global architecture for biodiversity governance, such that cities are now given more prominence within the global Convention on Biological Diversity. In parallel, we witness a growth of transnational networks seeking to both advocate for cities within international fora and to foster urban responses, a phenomenon both generated by and contributing to the fragmentation of authority to govern urban nature. In short, the rise of cities on the biodiversity agenda is leading to transformations in how and by whom biodiversity is governed both within the urban arena and beyond.

However, some fundamental issues persist and form the key challenges that will need to be addressed if we are to realize a transformation in how urban biodiversity governance is pursued and to what ends – in short, if we are to generate governance *for* transformations. The first issue concerns how matters of biodiversity can become mainstream within urban development and how cities come to be positioned within biodiversity governance (and vice versa). Despite a growing recognition of its importance, biodiversity is relatively marginalized in policymaking and planning in cities. Among most of those transnational networks/initiatives that incorporate biodiversity goals and targets, biodiversity is usually regarded as a “co-benefit” of urban efforts to reconfigure their economies and address climate change. This not only limits the attention given to biodiversity per se, but also means that the underlying drivers of biodiversity loss beyond the city limits receive limited attention – for example in terms of cities addressing the impacts of their consumption or of waste in terms of their effects on the loss of biodiversity or in terms of how they compromise the capacity of other communities to realize the benefits of nature. On the one hand, a continued emphasis on the win–win potential of initiatives for addressing biodiversity while also attending to other critical urban priorities will be necessary to maintain its position on the urban agenda, yet at the same time it will be crucial that cities come to see themselves as having a fundamental role in governing nature within and beyond their own boundaries through further embedding this issue in key policy arenas and through the actions of critical stakeholders in urban development. We suggest that it is unlikely that governance for transformative action that addresses the underlying urban drivers of biodiversity loss will be found through existing institutions, but will rather require new coalitions and partnerships that bring urban actors together with those in the business and finance sectors as well as through place-to-place partnerships. Rather than expecting this to be a fully joined-up or integrated process, as with the climate agenda, we might witness a growing fragmentation and complexity of governance in order to address the critical issue of transformative change.

Second, and related, a transformative approach to biodiversity governance would necessarily need to challenge which forms of urban nature come to count in the pursuit of urban sustainability. As nature-based solutions are gaining traction, the delicate relationship

between nature and society that coexists within cities becomes particularly salient, even if such forms of “hybrid nature” are not afforded much value in terms of conservation or do not represent the restoration of previously lost ecologies. Cities are spaces for new kinds of mundane nature that bring significant worth to everyday life and also provide the space for novel ecologies that consist of what might be termed invasive or non-native species, around which forms of human and nonhuman association and community are often developed. Questioning which forms of nature are seen to belong or are to be excluded from the city, by whom and to what purpose, in turn might lead to a transformation in how urban biodiversity should be understood, conserved, restored and prioritized in order that diverse communities can thrive with nature. Such an effort will require more inclusive forms of governance, as suggested in the Introduction to this book, but it also suggests that we will need to leave space open for dissent, contestation and protest in order to realize transformative governance for biodiversity.

Last but not least, how issues of social exclusion and injustice can be addressed (rather than exacerbated) is a significant problem, but one that must be solved if biodiversity governance is to become truly transformative. While a focus on inclusive governance points to the importance of ensuring equitable processes, governance *for* transformation also requires that we focus on the outcomes that are generated through interventions for biodiversity governance and how such forms of governance either serve to reproduce or challenge existing socioeconomic and power inequalities. Given that some nature-based solutions projects risk excluding minority or Indigenous communities in the project design and implementation process, displace residents who cannot afford the resulting rising house prices and can serve urban elites at the expense of others, there is a growing concern that the governing of urban nature will entrench forms of neoliberal economic development and social exclusion. Transformative biodiversity governance will necessarily involve a fundamental reordering of structures of power and knowledge that can enable social and environmental justice to be secured and enhanced, and as such is likely to be highly contested and often contradictory and fragmented. Focusing on the underlying drivers of the loss of biodiversity and the diminished and unequal contributions that nature makes to people will, as other contributions to this volume make clear, be necessary if governance is to be transformative. This in turn suggests that it will not be sufficient for global institutions and transnational networks to promote urban action on nature, but that they will need to play a critical part in building the capacity and vision needed for cities to ensure that they take action for nature within and beyond urban boundaries that not only contributes to global biodiversity goals but also ensures social justice.

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