

Becoming Killable: White-tailed deer management and the production of overabundance in the Blue Hills

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Acknowledgments

We would like to express our incredible gratitude to the many interviewees that spoke with us and the staff at MassWildlife and DCR, particularly in the DCR Archives office. We indebted to the audience members and participants at the Washington, DC. And New Orleans, and Boston AAGs for their feedback on earlier versions of this work. We thank Leesa Fawcett and Erin Luther, who provided inciteful feedback on an earlier draft of this manuscript, and the three anonymous reviewers for their thoughtful comments that improved the final version of this article. Finally, we appreciate the leadership of Sue Ruddick and Bronwyn Clement in coordinating this special issue. All errors are our own.

Funding

This work was supported by the National Science Foundation [1832191].

To cite this article: John Patrick Connors & Anne Short Gianotti (2021): Becoming Killable: White-tailed deer management and the production of overabundance in the Blue Hills, Urban Geography, DOI: 10.1080/02723638.2021.1902685

Abstract: This paper examines the implementation of a white-tailed deer management program in the Blue Hills Reservation outside of Boston, Massachusetts. Drawing on the concepts of biopolitics, we explore how white tailed deer became an object of concern and ultimately targets of lethal management in this suburban park. Through interviews, document analysis, and observation of public meetings, we examine the changes in and controversy over the presence, perception, and management of deer in the park. We argue that the implementation of the deer management program is only partially explained by the growing numbers of white-tailed deer, and must also be understood in the context of concerns about human health and shifting imaginaries of urban green spaces and global biodiversity. The case illustrates the entanglements of harm and care in the management sub/urban ecosystems and highlights how differences in the ethical and ontological understandings of deer create tensions in efforts to advance multispecies urban planning.

Keywords: biopolitics, conservation biology, white-tailed deer, more-than-human geography, novel ecosystems

Introduction

On the morning of November 30, 2015, hunters carried shotguns into the Blue Hills Reservation¹ on the outskirts of Boston, Massachusetts to participate in the first sanctioned hunt on this property since its creation in 1893. The hunt was organized by the Massachusetts Department of Conservation and Recreation (DCR) in coordination with the Division of Fisheries and Wildlife (MassWildlife), with an official objective to reduce deer numbers and thereby support forest regeneration. As hunters arrived, they passed protesters, surrounded by police officers and barriers, holding signs that read “Killing Deer Won’t Stop Lyme” and “100 years of Peace Shattered by Shotguns.” The protests did not halt the hunt, and 158 hunters entered the park over the course of four days, killing 64 white-tailed deer. The hunt has been repeated in subsequent years, with increases in the amount of land open to hunting, the length of the hunt, and the numbers of hunters involved.

The changes in deer populations, the management response, and the controversy are familiar events in many communities across North America. Deer populations have grown sharply over recent decades, particularly in and around suburban communities. Like many generalist species, deer flourish in these suburban spaces as they are able to take advantage of the abundance of food, absence of predators, and favourable habitat (Luniak, 2004). The bounds between residential and conservation areas can be porous in these landscapes, and deer often move across these boundaries, benefiting from the shelter of extant forest while enjoying the bounty of residential landscapes. Within patches of forest in these heterogeneous landscapes, deer are active drivers of ecological change – heavily browsing vegetation and altering forest composition (McShea 2012). In light of these novel conditions, wildlife professionals frequently express concern regarding the ‘overabundance’ of the species (Augustine & DeCalesta, 2003; Côté, et al., 2004), and some consider white-tailed deer to be one of the “greatest challenges

¹ Reservation here refers to the name of the conservation area, and should not be confused with other common uses of the term.

facing wildlife professionals” (Warren, 1997: 213). Faced with these challenges, many municipalities and conservation managers are moving to reduce deer populations through lethal means, often in areas where hunting has been uncommon or even forbidden in the past.

The demographic success and mobility of deer challenges the separation of the wild and the domestic in cities and the perception of cities and suburbs as *human* territories. While these imagined boundaries between humans and nature influence decisions about the organization of space with limited consideration of other life (Metzger, 2015; Wolch, 1996, 2002), cities nevertheless represent hybrid spaces, where processes unfold through the coming together of both human and non-human actors (Whatmore, 2002). As is the case with the Blue Hills, the mobility of non-human species and humans across the bounds of residential and conservation areas links these spaces and their management. Giving attention to mobility as well as the political and spatial practices of managing deer and other species can reveal how modes of environmental governance are produced and operate (Hodgetts, 2017; Lorimer, 2015; Whatmore, 2002).

We examine how deer became objects for environmental management in the Blue Hills, and address the broader question: how do some spaces become sanctioned sites for killing and how do some species become killable in urban spaces? Drawing on archival research, participant observation, and semi-structured interviews, we explore the shifting logics of environmental management that have accompanied changing deer populations. Whereas existing research has focused on how public concerns over deer populations emerge in response to increasing deer numbers and human-deer conflicts (e.g., Carpenter, Decker, & Lipscomb, 2000; West & Parkhurst, 2002), we focus on the construction of the category of ‘overabundant’ and the mobilization of this concept in a broader biopolitical project of conservation. We show that that the emergent practices of wildlife management in sub/urban landscapes have been co-constituted with a shift in the logics of managing sub/urban green spaces and concerns for human health, leading to new understandings of appropriate uses of violence in the care of both human and nonhuman life.

Urban Conservation as Biopolitics

The rise of the sanitary city in the 19th century drove the removal of animals from human spaces and recognized unsanctioned animals as ‘pests’ (Atkins, 2012; Gaynor, 1999). These efforts to sanitize and humanize the city reified boundaries between civilization and nature, reproducing dichotomous relationships between human/nature and town/country (Philo, 1995). Scholars in animal and more-than-human geographies disrupt these dichotomies and the human exceptionalism of cities by highlighting the lively presence of non-humans, confronting anthropocentric conceptualizations of urban spaces, and recognizing the city as a space constituted by multispecies relationships (Braun, 2005; Houston, et al., 2018; Hovorka, 2008; Wolch, 2002).

Foregrounding urban animals has revealed the persistent ‘wild’ in urban spaces (Hinchliffe, et al., 2005; Lorimer, 2008) and exposed the influence of ‘pests’ and other abundant urban species in shaping environmental policy and practices (Barua & Sinha, 2019; Biehler, 2013; Del Casino, 2018; Hinchliffe et al., 2005; McKiernan & Instone, 2016). Animals and other non-humans are constitutive of urban culture and space (Instone & Sweeney, 2014; Srinivasan, 2013; Urbanik & Morgan, 2013) and are increasingly recognized as key actors in environmental politics and conservation, shifting individual engagement in politics, shaping human actions, and remaking landscapes (Dempsey, 2010; Fleming, 2017; Griffiths, Poulter, & Sibley, 2000; Gruffudd, 2000). By bringing nature back into an understanding of (sub)urban landscapes, geographers have reimagined the sites and actors involved in the production of urban spaces through struggles over territory, power, and knowledge (Grove, 2009; Heynen, Kaika, & Swyngedouw, 2005; McKinnon, et al., 2019; Swyngedouw, 2004, 2006). This work opens new conversations about the ethics of multispecies urban planning and what a “good city” looks like (Houston et al., 2018), shaping possibilities for cohabitation and other new ways of experimenting and living with nonhumans (Boonman-Berson, Turnhout, & van Tatenhove, 2014; Hinchliffe, 2007; Hinchliffe et al., 2005; Lorimer, 2015; McKiernan & Instone, 2016).

Foucault’s concept of biopower provides a useful framework for examining the production of governable spaces through environmental management (Rutherford 2007) and

124 how some species emerge as killable in these spaces. Biopower can be understood as influence
125 over life itself and is commonly summarized as the power to “make live and let die,” which
126 manifests as practices that regulate the structure and circulation of life (Foucault, 2004, 2007).
127 Biopolitical regimes are oriented toward aggregate outcomes in the population and the
128 production of traits that are deemed to be normal and desirable for a society (Foucault, 2007;
129 Legg, 2005). This process of promoting life simultaneously involves suppressing life, as lives
130 that are deemed abnormal may be subject to punishment or allowed to die (or be killed) in the
131 name of supporting the larger population (Foucault, 2004, 2007). Extending Foucault’s concept
132 of biopolitics and governmentality, posthumanist scholarship has demonstrated how
133 categorization of nonhumans is often entangled with the racialization of human populations
134 (Biermann & Anderson, 2017; Biermann & Mansfield, 2014) and knowledge-practices
135 (Holloway, Morris, Gilna, & Gibbs, 2009).

136 We expand on work that uses a biopolitical framework to understand conservation
137 practices (Biermann & Anderson, 2017; Biermann & Mansfield, 2014; Braverman, 2014;
138 Collard, 2012; Holloway et al., 2009; Lorimer & Driessen, 2013) to examine the biopolitics of
139 wildlife management in sub/urban areas. As Biermann and Mansfield (2014: 262) highlight, a
140 “racialized logic of abnormality” is central to understandings of biological diversity and
141 conservation, supporting the distinction of species based on their purity and a selection of those
142 favored to make live or let die. Environmental management’s attention to the ontology of the
143 population (of particular species and of ecological communities) allows some lives to be
144 classified as abnormal and a threat to the larger population, thereby neglecting the ethical
145 concerns regarding the treatment of individual non-humans (Srinivasan, 2013, 2014).
146 Understanding animals ontologically as populations supports claims of win-win human-animal
147 scenarios, as the aggregation to a population makes the death of individuals palatable
148 (Srinivasan 2014).

149 There is a growing literature on the killability of animals and pertaining to animals in
150 urban spaces. This literature highlights the ways that the autonomy of organisms is spatially
151 situated and can vary across locations (Ward & Prior, 2020). Ideas of nativism of species are

location-specific, but also articulate with the priorities and dominant knowledge of conservation agents (Perkins, 2020). Margulies (2019) demonstrates how conservation practices differ across space, and how conservation may produce deathly spaces, where marginalized human populations may also be exposed to greater risk of harm. Many species span regulatory and ethical boundaries, resulting in precarious autonomy of organisms as they transcend geographic and ontological boundaries (Holm, 2020; Srinivasan, 2019). Arcari and colleagues (2020) further address spatially differentiated ethics, demonstrating the ways that animal studies have been relatively inattentive to commodified animals that are often excluded from the nature of cities.

Through an attention to the practices of deer management in (sub)urban landscapes, we consider how abnormality is constructed in the context of emerging environmental and health knowledge and concerns. The hunt in the Blue Hills and the controversy surrounding it illustrate the ways that broader shifts in thinking about the function and purpose of urban green spaces produce bodies and landscapes where violence is legitimized as a form of essential care. This analysis contributes to an understanding of the spatially differentiated practices and ethics of conservation, revealing how the socialities of humans and nonhumans are produced through spatially contingent practices.

Producing Overabundance in the Blue Hills: Case Study

The Blue Hills Reservation (BHR; Figure 1) was established in 1893 on the ancestral territory of the Massachusett and lies on more than 6,000 acres surrounding Great Blue Hill.² The park spans portions of six towns (Milton, Quincy, Braintree, Canton, Randolph, and Dedham) with a collective population of 235,261 in 2010. Surrounded by urban and suburban

² Although the Massachusett tribe is not federally recognized, members of the tribe maintain a Tribal Council and preserve cultural practices. The Massachusett Tribe were not involved in the initial planning of the BHR hunt, and some members attended protests against the hunt, seeking inclusion in the planning process.

development, the northern boundary of the park is just two miles from the City of Boston and multiple roadways cut through the park, connecting it directly to neighborhoods in the southern part of the city. Overseen by the DCR, the park attracts more than 100,000 visitors annually to its 125 miles of trails, two ponds for recreational swimming, golf course, downhill ski slopes, and natural history museum.

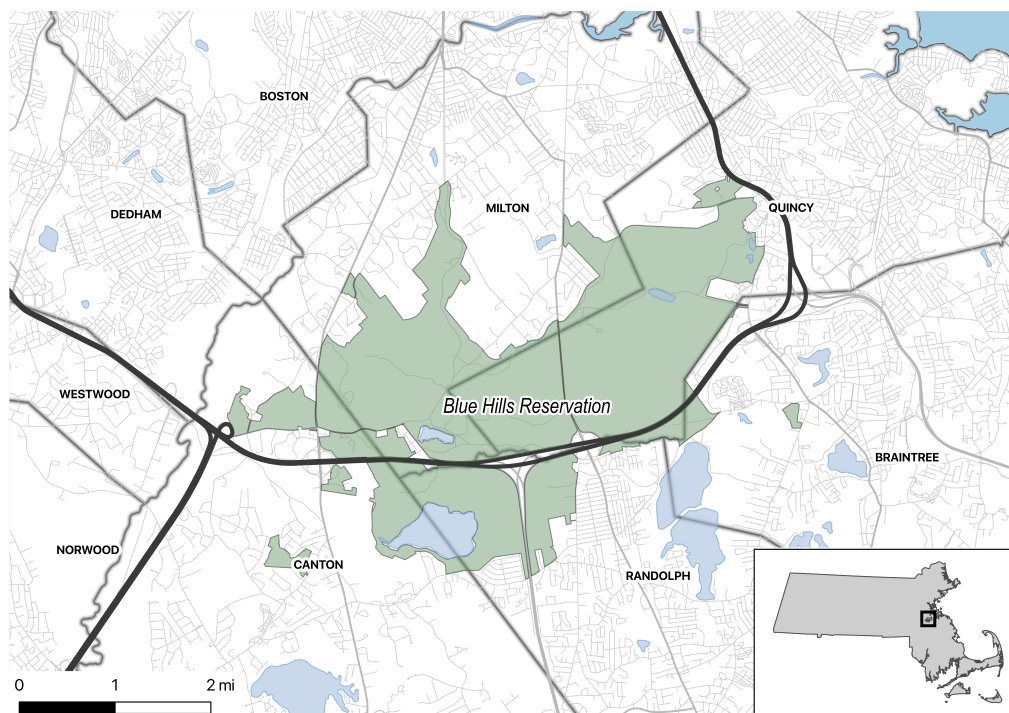


FIGURE 1: The Blue Hills reservation and surrounding towns

In the remainder of the paper we discuss the BHR deer management program jointly managed by DCR and MassWildlife. The first hunt, involving the use of controlled shotgun and archery hunts to reduce deer populations, took place over a period of four non-consecutive weekdays in 2015. The hunt included about 3,000 acres of the park and participating licensed hunters obtained permits for the controlled hunt through a lottery. Selected hunters were required to purchase two antlerless permits (controlled hunts target female deer as a means of preventing reproduction).

Our analysis focuses on understanding how deer came to be understood as a threat, so we explored both the history of the park and deer within it, as well as the contemporary conflict related to the Blue Hills hunt. We reviewed the park management plans, environmental reports, and correspondence related to the creation of the park at the DCR's archives. We extracted information from the reports related to the purpose of the park, management objectives, threats to the park, and notes on the presence/absence of deer. From 2015 to 2017, we attended public meetings, protests, and workshops related to deer management in the BHR. We spoke informally with participants at these events and conducted 18 in-depth interviews with representatives from state agencies, staff at environmental organizations, protesters, community organizers, and hunters. The interviews lasted 90-120 minutes and were semi-structured, using open-ended questions to address three predefined themes: the involvement of individuals in the Blue Hills hunt (as hunters, coordinators, protesters, etc.), perceptions of deer population and impacts, and perceptions of management needs/strategies and the planning process. Interview respondents were identified through their participation in public meetings, protests, or the hunt as well as through snowball sampling. Respondents included representatives from DCR, MassWildlife, the Friends of the Blue Hills (a community organization dedicated to preserving the BHR habitat and recreation areas), the Friends of the Blue Hills Deer (an animal rights group that emerged in response to the hunt), and Massachusetts Audubon Society as well as hunters.

From target of conservation to threat to preservation

White-tailed deer were once common in the Blue Hills, but their numbers have changed dramatically over the relatively short history of the park and the longer history of the region. Aggressive hunting and clearing of forests by European colonizers contributed to significant declines in deer and their predators across Massachusetts during the seventeenth century, leading to early efforts to regulate hunting (Foster et al. 2002). In 1698, the colony of Massachusetts reduced the length of the hunting season, and by 1739, game wardens began to enforce hunting regulations across the state. Despite these early interventions, deer were

extirpated from the eastern and central two-thirds of the state, spurring a 10-year moratorium on hunting in 1898 (Foster et al. 2002).

The late 19th Century push toward the preservation and restoration of deer populations came alongside a period of widespread land conservation efforts in Massachusetts. The landscape architect Charles Eliot, an apprentice of Frederick Law Olmsted, advocated for the preservation of scenic beauty in Massachusetts through lectures, writing, and consultations. Eliot's work influenced the formation of the Trustees of Reservations³ in 1891 and the creation of Massachusetts Metropolitan Parks Commission in 1892 (which was later folded into DCR). As was common in this late Victorian period, parks in Massachusetts were viewed as sanctuaries from urban life and sites of spiritual healing (e.g., Gandy 2002; Swyngedouw and Kaika 2000). When established, the BHR was geographically separated from the more compact and dense settlement of Boston, and intended to offer refuge from the City:

The life history of humanity has proved nothing more clearly than that crowded populations, if they would live in health and happiness, must have space for air, light, for exercise, for rest, and for the enjoyment of that peaceful beauty of nature which, because it is the opposite of the noisy ugliness of towns, is so wonderfully refreshing to the tired souls of townspeople. (Eliot 1893: 82)

The early park landscape was a mix of forest and large open spaces that had been cleared for agricultural purposes. Land managers wanted to preserve the beauty of these open spaces and early park documents argued for maintenance of some clearings for “the throngs of people who will ultimately resort to the reservation [who] will have need of open land” (Manning 1895: 79).

³ The Trustees of Reservations is a non-profit conservation organization in Massachusetts that is the first land conservation nonprofit in the United States.

Deer were absent or extremely rare at the parks opening, and they would remain so for more than eight decades. The 1971 Natural Resource management plan for the BHR notes several species of wildlife present in the park but makes no mention of white-tailed deer (MDC 1971). The 1984 resource management plan explicitly highlights the absence of deer while noting the lasting impacts of larger wild and domestic herbivores in the region:

Although there are no longer herds of large herbivore such as deer in the Blue Hills, these animals were once common. Herbivores in large numbers can have profound impacts on the plant species composition because they eat the more palatable plant species and leave the less palatable ones. Past grazing and browsing, not only from wild herbivores but also domestic livestock such as sheep and cattle have undoubtedly had an effect on the species composition in some areas of the reservation. (MDC 1984: 21)

Deer are thought to have returned to the BHR in the mid to late-1990s. The combination of excellent habitat and a lack of predation facilitated their population growth. A staff member at MassWildlife in an interview described these changes: “once they got in these little pockets of great habitat with a lot of edge habitat, a lot of building development coming in, it was really everything they needed, plus sanctuary from having to worry about, you know, hunting.” By 2011, deer had been identified as a concern for the Blue Hills landscape. The 2011 Blue Hills Resource Management Plan specified that understanding deer impacts was a high priority, calling for a study and consideration of deer management options if necessary (DCR 2011).

Deer were formalized as an object of management by the 2014 Environmental Bond Bill – state legislation that directs DCR to “identify areas in which deer overpopulation is negatively impacting forestation, water resources or plant growth on department-owned land” and “to develop and implement a harvest management plan for the identified areas” (MGL Chapter 286 Section 43 2014). The bill required DCR to develop deer management plans for all their properties with more than 50 deer per square mile. Deer densities are not monitored for most DCR properties, but a 2013 study estimated 85 deer per square mile of deer habitat in the

BHR (DCR & DFW 2015). In summer 2015, DCR publicly distributed the initial draft of the Blue Hills deer management plan, which included a controlled hunt. The objective of the hunt was to help reduce deer numbers to the statewide target of 6 to 18 deer per square mile of forest in order to reduce forest impacts. Following three public meetings and considerable public protest, the first hunt was undertaken in November 2015 and has occurred in all subsequent years.

This management response reflects an understanding of deer as “overabundant,” a label managers commonly use to describe large deer populations across North America (McShea et al., 1997). Deer overabundance is generally understood as occurring when deer are designated as a threat to environmental health or to human well-being in one or more of the following contexts: “(1) when the animals threaten human life or livelihood, (2) when the animals depress the densities of favored species, (3) when the animals are too numerous for their own good, and (4) when their numbers cause ecosystem dysfunction” (McShea et al., 1997: 3). The population of the BHR deer was enough to trigger the Environmental Bond Bill’s mandate for intervention, but the positioning of deer in the Bill itself was contingent on the emerging understanding of the threats from deer.

Producing overabundance 1: Deer as a threat to forests

DCR prepared the 2011 BHR Resource Management Plan through a process that included community input from public working groups and written comments. The plan lists white-tailed deer as well as a number of invasive plants and insects in a section titled “Current and Potential Threats,” noting that “over-browsing by deer is decreasing the abundance of once-common herbaceous species (e.g., Canada mayflower, moccasin flower) and preventing forest regeneration in portions of the Blue Hills” (DCR 2011: 153-154). The report quotes a US Forest Service employee who surveyed vegetation in the BHR and raised concerns that the forested ecosystem “is disintegrating” and that “virtually all of the interior forests at Blue Hills are, essentially, dying due to widespread regeneration failure of almost every tree species...” (Email

from USFS ecologist Rawinski 2010 quoted in DCR 2011: 154). The plan calls for a formal study of the impacts of deer and consideration of management options (DCR 2011).

In contrast to this focus on ecosystem health, the early management plans for the park emphasized the importance of regulating forest regeneration in order to ensure the maintenance of a particular aesthetic that would appeal to urban dwellers visiting the park. The 1934 plan repeatedly describes strategies to enhance the beauty of the park, arguing for extensive forest thinning, stating that: “In general, one of the most important gains of thinning operations is the relief of monotony in the woodlands” (Shurecliff, 1934). Into the 1990s, the management plans continue to emphasize the importance of the BHR as a respite from urban life: “the Blue Hills represent an oasis amidst the pressures and chaos of development and population growth” (MDC 1990: 1). Management plans in the 1980s and 1990s framed the park as an urban oasis while also emphasizing the importance of conserving biodiversity within the park, particularly rare and endangered species. Later reports highlight the significance of BHR for biodiversity:

“The Blue Hills Reservation is sanctuary and habitat for a variety of life forms, that are largely typical of a southern New England Woodland. The great environmental diversity of the Blue Hills, in contrast to the urban development which surrounds it, is perhaps its most significant and important value.” (MDC 1990: 8)

The 1990 management plan states that “perpetuation of a total ecosystem is of primary importance” (MDC 1990: 16). The emphasis on biodiversity and ecosystem preservation embodies a shift to conservation as an apparatus of security, protecting biodiversity and ecosystems. Whereas the conservation practices of the first century of the BHR sought to create and protect a place as a sanctuary for humans, internal threats to the security of the forest ecosystem become a primary rationale for management practices in subsequent years and aesthetic concerns shift to reflect new ideas about forest health and urban oases, as Brad, a DCR employee said in an interview:

322 “Hopefully, some day with fewer deer and more of that happening, when you’re
323 walking on a trail, instead of being able to look twenty feet across and see a highway,
324 you might be able to not see the highway and see more trees, you know. Because it’s
325 an urban environment - we get that - but it was kind of set up as an oasis from the urban
326 environment. And now you go to the Blue Hills and you can see clear across to all the
327 roadways and all the development that’s around there. If we can get more of that
328 growth into the forest, you could be walking down a trail and not see a lot of that. You
329 would be in the forest, you know?”

330
331 The reappearance of deer in the BHR coincided with this evolution in the logic and
332 practice of park management. The growth of deer populations presented a rupture in the
333 understood ecology of the park, where a particular assemblage of species has arisen in the
334 absence of deer. For managers seeking to maintain and advance a specific ecological structure
335 and corresponding processes, the recovery of deer presented a threat to other life. As a state
336 forest management professional, Mark, stated:

337
338 “...when our agency is involved, we’re concerned about it for the health of the forest
339 and how that impacts other wildlife that we’re also responsible for managing. All
340 wildlife depends on a healthy forest. And we don’t want deer to ruin it for everything
341 else.”

342
343 This concern regarding forest health was inherently a concern for the future state of
344 BHR, considering the park’s future biodiversity and appearance, and ensuring the maintenance
345 of this ecosystem indefinitely. Land managers were concerned that deer were compromising the
346 composition and resilience of the forest, as Mark said: “And some day you might get a huge
347 natural disaster - some kind of hurricane or tornado blows through the Blue Hills - and there’s
348 nothing growing underneath to take the place of what’s been destroyed.”

At public meetings to discuss the planned deer hunt, representatives from DCR and MassWildlife provided PowerPoint presentations highlighting the impacts of deer on forest health. They presented images of areas inside and outside of deer exclosures – areas with fencing to prevent deer access – to demonstrate the impact of local deer browse on vegetation. In doing so, deer were positioned as overabundant – a threat to forest ecology in need of human intervention. Whereas the growth of deer populations was framed as an unnatural outcome of human disruptions to the ecosystems arising from the removal of predators and supplementing deer diets through suburban landscaping, human interventions to reduce deer populations were presented as a natural remedy to these circumstances, restoring a lost balance of nature.

A similar shift in understanding about deer occurred within the Friends of the Blue Hills (FOBH), a non-profit organization that advocates for preservation activities in the Blue Hills. While working to manage invasive species, the group came into contact with wildlife biologists and ecologists that suggested deer may be contributing to invasive species spreading. Maureen, a FOBH representative, highlighted in an interview that the group's interest in deer was part of a larger shift in priorities from protecting the land from incursion to thinking about the ecology of the park:

“[We] were just so focused on development pressures. And there were people on the Board at various times who were very concerned about invasive species and the quality of the habitat that you're protecting. But I think before that it was mostly we need to protect the land as opposed to the, you know, think about the quality of the land that you're protecting.”

Aware of the controversy that may arise related to deer hunting in the Blue Hills, this group attempted to stir public support in managing deer by organizing public meetings. These meetings were attended by Linda (name changed), who would later become a major influence in implementing the hunt. She noted the impact of these meetings: “That's when we all kind of went whoa, it's the health of the forest, and the people, and the songbirds, and all the life in the Blue Hills. So when one thing gets out of balance, it can harm so much.” Though Linda's

concerns regarding the role of deer in disrupting ecological wellbeing were critical in the emergence of wildlife policies, her attention to deer was intertwined with concerns about human health that produced a window for implementing ecological management strategies.

Producing overabundance 2: Deer as threat to humans

While concern about forest health is the official justification for deer management in the Blue Hills, the threat deer pose toward human health was a prominent public concern that mobilized action by the surrounding community and politicians. Interviews with nearby residents, representatives from community organizations, and agency staff revealed the ways human health concerns, particularly Lyme disease, drove the inception of the state legislation as well as coordinated efforts to hunt deer on nearby private land. Reflecting on the emergence of the Environmental Bond Bill, several interviewees noted the importance of the activism of a relatively small group of residents in an affluent neighborhood adjacent to the BHR. The group was mobilized by Linda after she and her husband contracted Lyme disease in 2008. After learning of other neighbors with Lyme, she conducted a survey of 30 households in her neighborhood, which found that there were 18 people in those households who had recently contracted Lyme disease (some more than once) and that the majority of those surveyed viewed Lyme disease as a local public health concern (Linda, Interview, 10/28/16). She explained that she then worked with the FOBH to convene a series of meetings with neighbors and representatives from agencies to discuss their concerns about the rising incidence of Lyme disease and deer in their community:

It was 2011 or 2012 was when we started doing those, like a series of meetings in Milton. And I met with at least seventy people, like one-on-one meetings or small group meetings to see what people cared about, and Lyme disease was one of the issues that kept coming up. And I have to admit, I didn't want to deal with it... because I didn't want to take on an issue that had to do with killing deer.

404 Despite reticence for killing deer, some residents began to view hunting as the only possible
405 remedy for the threat of Lyme disease. Residents in the aforementioned neighborhood
406 coordinated their own hunting program – recruiting and screening hunters, and providing access
407 to their properties. These residents then turned their attention to the deer population in the
408 adjacent BHR and set up a meeting with State Senator Brian Joyce. “A bunch of the moms from
409 the neighborhood sat down with him at Dunkin Donuts and, you know, told him our kids are
410 getting Lyme disease. We’re getting Lyme disease. We’re really freaked out about this”
411 (Linda, 10/28/16). Senator Joyce responded to these public health concerns from his
412 constituents with sponsorship of Section 43 of the Environmental Bond Bill (the section that
413 mandated the hunt in BHR).

414 The Environmental Bond Bill and all of the subsequent Blue Hills Deer Management
415 Plans focus on deer as a threat to forests,⁴ but interview respondents from state agencies and
416 community organizations agreed that concern about Lyme disease generated public support and
417 mobilized the state legislation linked to the BHR hunt. While emphatically reiterating that the
418 hunt was in response to the threat of over-browsing on the forest, officials at state agencies and
419 community organizers acknowledged that the public concern about Lyme disease played a role
420 in generating the political coalition that ultimately led to the implementation of the deer
421 management plan. They also acknowledged the challenge of disentangling these health concerns
422 from ecological management objectives, as residents, and the State Senator frequently centered
423 health concerns in public meetings. At a public meeting about the 2016 deer management plan,
424 Senator Joyce remarked:

⁴ The 2015 Blue Hills Deer Management Plan states: “The decision to manage the overpopulation of deer in the Blue Hills Reservation is not dependent upon perceptions regarding the role of deer in relation to Lyme disease or other tick-borne illnesses” (DCR & DFW 2015).

426 “This is an important issue for me. This is a public health issue and I want to protect our
427 beautiful natural resources... I had a lot of complaints about Lyme disease and
428 problems with deer, which is part of why I put in the Environmental Bond Bill... I am
429 responding to concerns about Lyme.”

430
431 These concerns about Lyme disease were repeatedly cited by interviewees and meeting
432 participants as a motivation for hunting deer in the BHR and adjacent private land, even as
433 many acknowledged the uncertainty about this approach in reducing the spread of the disease
434 due to the complex ecologies of Lyme disease.⁵ To residents and community organizers living
435 near the BHR and concerned about Lyme disease, deer represented a specific site of
436 management for the disease. Furthermore, institutions and practices to regulate and oversee the
437 killing of deer were well established and familiar to residents. Although residents and
438 organizations involved in advocating for the BHR hunt recognized the uncertain impacts on tick
439 population, they ultimately determined that efforts to regulate the circulation of deer populations
440 were worthwhile. In contrast, MassWildlife and DCR continued to maintain their objectives
441 were to improve forest health and not related to Lyme disease.

442 ***Contesting overabundance: Animal rights and scientific uncertainty***

443 Despite concerns about forest health and Lyme disease, deer are not universally
444 understood as overabundant and the BHR hunt has generated substantial opposition. The
445 announcement of the draft plan, public hearings, and initial hunt in 2015 was met with public
446 protests, comments at public meetings, letters to local officials, and editorials in local

⁵ Lyme disease is transmitted to humans in the eastern US by *Ixodes scapularis*, commonly known as deer ticks. Deer are not good reservoirs for Lyme disease, but play a role in the reproduction of adult deer ticks. Some propose deer reduction as a Lyme management strategy, but others suggest deer populations may have little impact on the transmission of Lyme (Levi, Kilpatrick, Mangel, & Wilmers, 2012; Wilson, Levine, & Spielman, 1984).

447 newspapers. Several animal welfare organizations, including the Massachusetts Society for the
448 Prevention of Cruelty to Animals, the Animal Rescue League of Boston, and the Humane
449 Society of the United States, released statements opposing the hunt. In addition, a coalition of
450 animal rights activists and other concerned citizens formed the Friends of the Blue Hills Deer
451 (FBHD). Led by two animal rights activists from Central Massachusetts, FBHD organized
452 protests and developed an active online presence. Efforts to suspend the hunt continued through
453 subsequent years primarily through lobbying state government for legislative changes. Across
454 meetings, protests, editorials, and lobbying efforts, opponents' concerns generally spanned three
455 areas: (1) welfare of the deer, (2) the use of violence in a space perceived as a 'sanctuary' or
456 'peaceful refuge,' and (3) the legitimacy of the science and positioning of deer as overabundant.

457 Those voicing opposition to the hunt came from across the state, and included students,
458 store clerks, professors, and retirees. Some were active already in the animal rights community,
459 including the primary FBHD organizers, but others were new such activism. For many opposed
460 to the hunt, the lives and welfare of deer were the central concern. Some interviewees expressed
461 opposition to any loss of deer life through recreational hunting while others had more specific
462 concerns, including suffering incurred due to bow hunting, behavioral changes of Blue Hills
463 deer due exposure to hunting, and concerns about the experiences of deer after the population
464 declined. One protester, Sheila, told us that she had great concern about fawns losing their
465 parents or aggression towards does due to gender imbalance after selective hunting of females:

466 "I don't remember the exact number, but I think 73 percent of the animals that were
467 killed were females, and now, what does that do on the remaining females, especially
468 during breeding season? Now there's fewer females. These other remaining females
469 might be bullied more. No one's taking into consideration the individuals that are being
470 targeted."

471 Although the specific concerns varied, animal welfare and animal rights were central
472 motivations of many that opposed the hunt. Some protesters opposed hunting altogether. As
473 Alison, one of the protesters, told us, "we have to start by recognizing that these animals have
474 some sort of right to life and some sort of right to well-being. That's where I start." Many

asserting an animal rights position called for alternative interventions, particularly sterilization and chemical contraceptive approaches. Wildlife managers, however, pointed to the ineffectiveness of these approaches in other locations (particularly Cornell University), the high cost of these techniques, and the lag in population decline allowing further forest impacts.

Given the opposition's openness to other management methods, Brad at DCR noted, "It's just a fundamental opposition to the use of hunting as a management tool" (Interview, 7/5/16). Some opponents, however, suggested that hunting may be acceptable in other locations where deer had more fear of people or were in fact an immediate threat to human life. Many opponents recognized that deer would die by other means, whether nonhuman predation or starvation, but favored these "natural" processes. Several protesters indicated that they just didn't believe hunting was needed or appropriate in the BHR, which many described as a sanctuary for both people and nature. As one letter to a local newspaper argued, the hunt would alter the "nature of this peaceful refuge forever" and a hunt would be "anathema to the essence of the Blue Hills" (Morrissey 2015). Some opponents even suggested that Charles Eliot would be disappointed with this move to open hunting. This appeal to a perceived original intent to produce a sanctuary was contrasted with the violence of a hunt and use of weapons: "In a world so full of guns, we desperately need to preserve this urban oasis shotgun-free for the future as previous generations have preserved it for us" (Sloane 2015). This discourse of sanctuary sometimes invoked a sociality of both the deer and humans, suggesting a lack of social memory to equip deer with the skills to protect themselves.

In addition to these ethical tensions, opposition to the hunt frequently presented concerns about the legitimacy of science underlying the characterization of deer as overabundant and the efficacy of the approaches in reducing the threats stemming from the deer population. Numerous comments at public meetings, in public statements by animal rights groups, and in editorials questioned the validity of population estimates, and argued that the hunt would fail to restore forest health or reduce Lyme disease. Many opponents questioned the timing of the most recent estimate of deer density, which came before a particularly snowy and cold winter, whereas others questioned the validity of the technique itself, which combined distance

sampling to estimate deer density and vegetation surveys,⁶ and some called for a new population estimate. These comments challenge the rationale for the hunt by suggesting uncertainty in the science or even falsification of results. Some protesters were sceptical of the role of deer in ecological transformation more broadly. One protester, Michelle, suspected other ecological processes explained changes in the forest:

Everything I've read says the forests do not change so much because of deer, but because of time and seasons, the climate, invasive species and other creatures - you know, worms, fungus. So, maybe there's a small percentage that is caused by deer. But I don't believe it's the majority of the change. They give deer too much credit, I think.

Lyme disease also became an important source of contestation at public meetings and fuelled additional questions about the political motivations behind the hunt. While the official deer management plans and presentations by DCR and MassWildlife consistently focused on forest health, opponents of the hunt expressed concern about the role Lyme disease played in motivating the hunt. Opponents highlighted Senator Joyce's statements about public health motivations and noted the large portion of time devoted to Lyme disease in the 2015 public hearing about the hunt. Opponents challenged the efficacy of hunting deer as a tool to manage Lyme disease and also cited this narrative shift, from public concerns about human health to official concerns about forest health, as evidence that the hunt was politically motivated.

Public safety concerns expressed at meetings were considered in decisions about the specific forms of hunting used in different sites, but the concerns regarding the ethics of hunting and the proper use of conservation spaces were largely deemed intractable given the objective of forest conservation and the State mandate set forth in the Bond Bill. Meanwhile, the potential

⁶ Vegetation surveys examine the presence of different vegetation species and signs of browse on these species, which is used to assess the impact of deer on the forest ecosystem.

limits of this approach for managing human health were considered irrelevant because the State agencies were not formally concerned with these outcomes. FBHD saw this dismissal of some of their concerns as evidence of the lack of interest in public engagement.

Discussion

The production of deer as ‘overabundant’ in the BHR was contingent upon growing concerns about Lyme disease, the interests of powerful actors, and the re-imagination of urban green spaces in terms of their ecological functions and utility for biodiversity conservation. Deer became objects of management when these concerns about human health fostered political action and support for state interventions in ecosystem management. In order to implement a hunt, however, the emerging discourse regarding deer and environmental management was codified through state legislation that created spatially bounded populations. In the remainder of the paper, we elaborate on three themes related to the production of certain spaces and bodies as sites of killing and management. Drawing on the Blue Hills case study, we show that that the emergent practices of wildlife management in sub/urban landscapes have been co-constituted with a shift in the logics of managing sub/urban green spaces, leading to new understandings of appropriate uses of violence in the care of both human and nonhuman life.

Collectives, Care, and Harm

The Blue Hills deer were made legible as a population, whose management was central to broader project of protecting life at various scales and across multiple locations. The official objective of the management plan was to support forest regeneration by reducing deer populations, but the sequence of events leading to the hunt also reflect the concerns over human health, property, and invasive species. In particular, the concerns over the health of a wealthy and politically influential community influenced state legislation. As such, deer became boundary objects for managing a diverse set of concerns, and regulating deer populations was seen as productive for addressing multiple threats to life both inside and outside of the park. In

order to address these diverse concerns that were linked to deer, proponents of the hunt focused on deer as a population that poses a threat to the broader ecosystem and human well-being.

The Blue Hills deer management plan follows common approaches of wildlife biology and conservation practices, aggregating individual deer into populations that are primarily a component of a larger ecosystem. In general, conservation and wildlife management focus on habitats and populations as opposed to individual organisms (Paquet and Darimont 2010), assuming that individuals are representative of species as a whole (Bear, 2011) and that individuals may be sacrificed for the population (Braverman, 2014). As Srinivasan (2014) argues, the focus on well-being at the scale of the population transforms “interventions in nonhuman lives that are interlaced with harm into interventions of care that address the well-being and flourishing of the animals— as populations” (p. 513). The shifting discourse of the Blue Hills management plans displays the rise in this ecological thinking and an emergent understanding of the BHR as a site of biodiversity conservation. Deer are thus positioned as a population that threatens the diversity of life in the BHR, thereby legitimizing their killing to support life overall. While concern for human life (in exclusive communities) drove political action, ecological concerns provided the formal rationale for legal interventions.

The opposition to the hunt demonstrates the tensions between this conceptualization of the collective and ideas about individual rights. Rather than focusing on deer as a population, many opponents of the hunt viewed deer as individuals with their own rights and in need of their own protections. The emphasis on the right of deer to life, led to different understandings of the ethics of intervention in deer populations, generally precluding hunting. Opponents highlighted the injustice of managing deer rather than human drivers of degradation (e.g., suburbanization, climate change).

These tensions between individual and collectivist views of nonhuman organisms mirror current ethical debates about “compassionate conservation”⁷ (e.g., Wallach et al., 2018;

⁷ Compassionate conservation offers a vision of conservation where concern for the welfare of individual animals is the primary tenet of conservation rather than the welfare of ecosystems,

Driscoll and Watson, 2019; Hayward et al., 2019). Compassionate conservation argues for peaceful coexistence between humans and animals and inclusivity of individual animals, calling for conservation practitioners to do no harm. Many conservation biologists, however, argue that harm is an inseparable part of life, and from a utilitarian position, human intervention may be most ethical by inflicting harm on a few to reduce harm for the many. For wildlife and land managers in our study, hunting was consistent with animal welfare, which managers argued would improve by reducing their competition for resources and reducing the likelihood of disease and hunger.

Ultimately, the Blue Hills case reflects a tension regarding the subjective determination of whether harm intentionally inflicted by humans is ethically equivalent to harm inflicted by nonhumans or indirect harm by humans. In general, opponents to the hunt distinguish these sources of harm and hold humans to a higher ethical standard, while those supporting the hunt generally see human harm as equivalent or ethically superior (due to its increased efficiency) than that inflicted by nonhuman forces and as a means to enhancing nonhuman welfare. Both groups seem to accept an ethical dualism, with proponents positioning deer as subject to harms not acceptable for humans, and some opponents positioning human killing as exceptional from nonhuman killing. Srinivasan (2019) argues for an attention to such plural ethical dualisms of society-nature relations, in which the ethical status of both humans and nonhumans may be compromised by transcending ontological bounds. She argues that ontological nondualism does not necessarily result in an ethical nondualism, and the denaturalization of some organisms may support an ethical deprivileging. In the following sections we consider how the geographies of wildlife institutions and the proximity of deer to humans informed arguments about the ‘naturalness’ of hunting and discourse of the ethics of killing in the BHR.

Biopolitical Space

The relationships between human and nonhuman life in the Blue Hills has been continuously (re)produced in the context of changing material environments, environmental imaginaries, and management practices. Ultimately the decision to manage deer in the Blue Hills reflects a convergence of an array of concerns related to human health, biodiversity conservation, and property damage, all of which are spatially contingent. As demonstrated by this case, overabundance is constructed in the context of specific social and environmental conditions, and is applied to geographically delineated collectives rather than the entire species. In general, species are not universally overabundant (or invasive), rather this category varies for populations depending upon their locations.

Despite the permeability of park borders and the mobility of deer, populations are geographically defined for management purposes, specifying deer that occupy a given locale as problematic, while deer outside of these bounds may be permissible (c.f. street dogs in Srinivasan 2013). These bounds, as seen in the BHR, coincide with the jurisdictional bounds of state agencies and land ownership. As a whole, deer in the State are overseen by MassWildlife, but heterogeneous patterns of land access split wildlife populations into units along these property boundaries. The Environmental Bond Bill established DCR properties as sites of management, producing modularized deer populations within these bounded ecosystems. This spatial codification further delineates populations along jurisdictional boundaries of state authorities and municipalities.

DeLucia's (2019) analysis of invasive species provides a useful analogue to understand how legal and regulatory mechanisms formalize some organisms as pests and can transform some life into 'bare nature,' which is sanctioned to be killed with impunity. Classifying species as exotic or invasive indicates that they are out-of-place and thereby serves to legitimize their eradication or management in order to preserve a "native" or "natural" ecosystem (Atchison & Head, 2013; Biermann, 2016). Deer differ from "invasive" species that are subject to such biopolitical rule because they are neither "out-of-place", nor can they be killed with impunity. Thus, deer illustrate that while species may be constituted as universal wholes, as through legal practices, such as the Endangered Species Act, they may also be constituted as geographically

differentiated and aberrant subpopulations in relation to locally defined baselines. Legally positioned as a resource or public trust, the state determines who can kill deer and where. As such, the Blue Hills deer hunt illustrates how biodiversity conservation discourse and practices articulate with local politics and ecologies. Although deer in other locales were already “killable,” the expansion of hunting in the BHR required a rationale for this specific site.

In order to become killable, deer in the BHR were constructed as part of a legible population, which was geographically defined and proximate to humans. Despite a focus on managing deer in the park and the objective of managing forest ecosystems, the relationship of deer to humans also featured prominently in the debate. By virtue of the location of the park in a sub/urban landscape, deer were in close physical proximity to humans, but they also were understood as being socially and ontologically proximate to humans. Physical proximity presented a threat because it increased the likelihood of vehicle collisions and property damage. Meanwhile, the role of deer in the transmission of Lyme Disease represented a social connection between deer and humans that may not entail direct contact. Rather, deer were socially proximate and important links in a network, facilitating human-tick interactions. Finally, deer in the Blue Hills were also often viewed as ontologically closer to humans and less “wild” than deer in other locations. This ontological proximity is reflected in the understanding of deer as produced by human actions (e.g. landscape change and predator eradication) and thereby being less-than-natural. This status was both a rationale for their management and their protection. Physical proximity to and interaction with humans can clearly influence understanding of certain species as pests, but the ideas of domesticated space also affect how nonhumans are positioned as “killable” or necessitating management. The controversy surrounding the management of deer in BHR, in part reflect the indeterminacy of this urban park and its nonhuman residents.

Novelty and Anxiety

The evolution of BHR management objectives capture the changes in the logics of conservation and preservation over the past century (Biermann and Anderson 2017), including

emerging concerns over management of novel and altered environments in the Anthropocene. As we show, the BHR was initially managed as a respite for humans escaping the city, but over time, management documents and planning practices emphasized biodiversity and ecological health, reflecting a transition from romantic ideals to ecosystem sciences and ecosystem services frameworks (Aronson et al., 2017; Gaston, Ávila-Jiménez, & Edmondson, 2013; Hansen & Pauleit, 2014). With this shift, sub/urban green spaces fit within a global network of sites to protect biodiversity (Lepczyk et al., 2017), mobilized in service of the core tenets of conservation biology: biodiversity should be preserved, untimely extinctions should be prevented, ecological complexity should be maintained, evolution should continue and biodiversity has intrinsic value (Soule 1985). In the case of the BHR, human intervention through hunting is framed as serving conservation through the correction to ecosystem imbalances created by human actions and to preserve specific assemblages associated with biodiversity, stability and resilience. Hunting is presented as a way to restore a natural baseline, replacing nonhuman predators (wolves, and cougars) and as a prophylactic against irreversible change.

Despite these efforts to protect nature, BHR is a heavily altered landscape, as reflected in its history and current use. BHR is home to a 36-hole golf course, a 60 acre ski area with 16 trails, and sits at the intersection of two major highways. The multiple objectives of managing the park already challenge the boundaries between the wild/domesticated and human/natural in (sub)urban, but these are further complicated by climate change and translocation of species. Debates regarding deer hunting in the BHR engaged broader processes of anthropogenic change, ranging from regional forest clearing and suburbanization to global scale climate change. Confronted with rapidly changing ecological assemblages and the emergence of novel ecosystems, Robbins and Moore (2013) argue that environmental managers are forced to re-evaluate their roles and normative assumptions that rely on presumptions about what constitutes a 'natural' system. Anxiety about the loss of our known environments (and associated professional and scientific practices) through extinctions and habitat loss is often replaced with fear that "allows the sufferer to focus on a particular object and so symbolically target an

external problem or object” (Robbins and Moore 2013: 10). Both those in favor of and opposed to the Blue Hills hunt emphasize a concern for change and loss, highlighting historic baselines by which to understand current conditions, whether these are strictly ecological baselines or sociocultural baselines related to the intentions in the creation of the park. Changes induced by deer become an extension of the phobias of anthropogenic environmental change (reflecting their proximity to humans), while also distancing other human processes from these environmental changes.

Shifting a broader anxiety of environmental change to deer makes novel ecosystems and ecological transformation legible, revolving around the management of a single species. Deer provided a bridge among concerns and to an abstract future, serving as a legible object of management to shape a larger spatiotemporal ordering of life. A focus on the nonhuman depoliticizes the processes that shape environmental change, including those that reproduce the (sub)urban landscapes that support larger numbers of deer. This analysis, however, demonstrates that the process of defining if populations and human interventions occur in the context of political struggles. Rather than justifying their protection, the attention to the agency of deer in environmental change also creates conditions for seizure of life in the name of supporting future life.

Conclusion

This analysis traced shifting environmental discourse and practice, demonstrating how the ambiguity of urban green spaces and animals (and novel assemblages, more broadly) challenge ontological dualisms, positioning humans as ecological actors while also denaturalizing some organisms. In (sub)urban systems, where ecological assemblages are often novel and rapidly changing, ambiguity surrounds the definition of normalcy and ideal environmental conditions. In this context, environmental managers face the indeterminacy of their own categorizations of landscapes and species, and the ethical tensions surrounding management prescriptions. The socio-legal practices of wildlife management are thus co-produced with (sub)urban environments as human negotiate how to organize life and the

spatialities of human-nonhuman relationships. As this study illustrates, shifting imaginaries about urban green spaces may contribute to the precarity of wildlife management and the entanglements of harm/care in urban ecosystems.

The concerns surrounding deer highlight challenges to advancing multispecies urban planning and conviviality with uncomfortable others (e.g., Hinchliffe, 2007; Houston et al., 2018; McKiernan & Instone, 2016). These tensions among actors are potentially irreconcilable without achieving some common ontological and ethical understanding of deer. Fundamental differences, however, were apparent in the positions related to the ethics of human interventions and killing in a hybrid landscape. Understanding of humans as components of broader ecosystems may still advance a discourse that positions the human role as primarily one of killing, revealing how an ontological nondualism does not ensure an ethical nondualism (Srinivasan 2019). Likewise, an ethical nondualism may be grounded in an ontological dualism, justifying the extension of rights to organisms by virtue of being external to society.

Following Robbins and Moore (2013), addressing this anxiety of managing such novel and hybrid landscapes requires confronting the conflicting desires of diverse scientists, managers, and residents. At the forefront of disputes about wildlife management are varied desires for environmental outcomes in distinct geographic contexts. The case of the Blue Hills Deer demonstrates the ways that desires to manage uncertain futures about human and nonhuman life can produce biopolitical subjects, and entangle practices of harm and care. The case of the Blue Hills illustrates the conflicts that can emerge through living with nonhuman others, and how nonhumans can become embroiled in politics. Such political appraisal of (sub)urban wildlife management reveals how killing of some organisms is legitimized, but also promises to reveal obstacles and pathways towards reducing this harm.

Acknowledgments: We would like to express our incredible gratitude to the many interviewees that spoke with us and the staff at MassWildlife and DCR, particularly in the DCR Archives office. We indebted to the audience members and participants at the Washington, DC. And New Orleans, and Boston AAGs for their feedback on earlier versions of this work. We thank Leesa

Fawcett and Erin Luther, who provided inciteful feedback on an earlier draft of this manuscript, and the three anonymous reviewers for their thoughtful comments that improved the final version of this article. Finally, we appreciate the leadership of Sue Ruddick and Bronwyn Clement in coordinating this special issue. All errors are our own.

Funding: This work was supported by the National Science Foundation [1832191].

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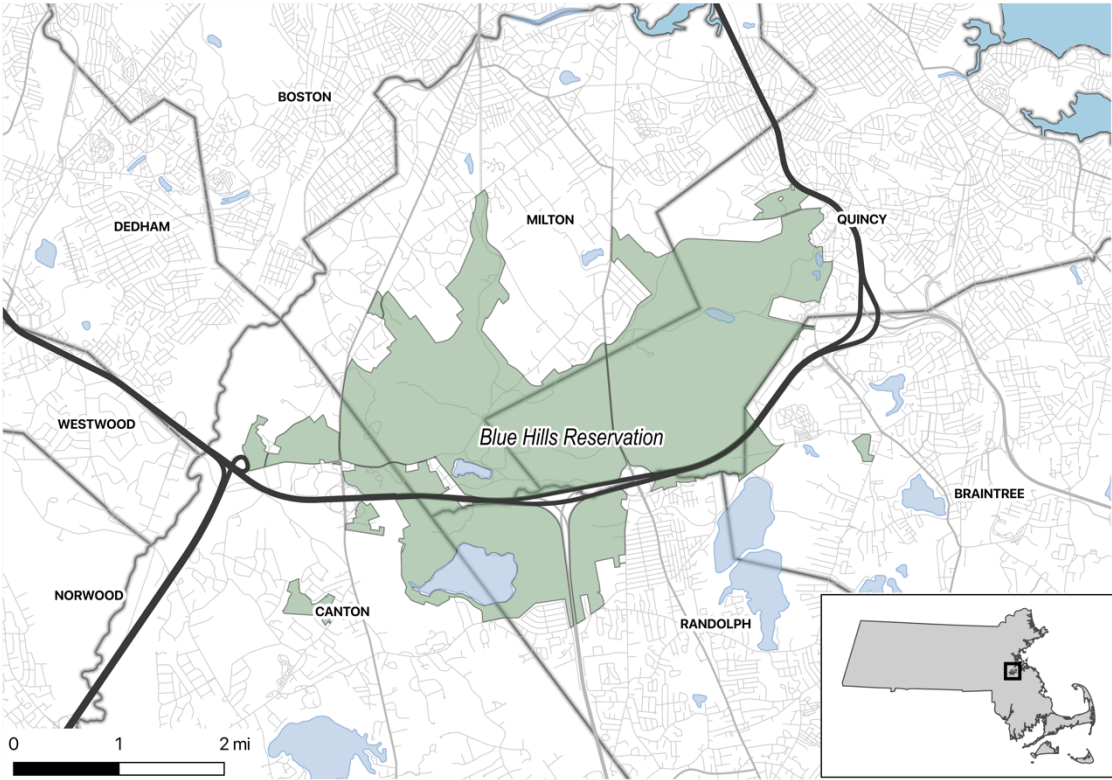
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FIGURE 1: The Blue Hills Reservation and surrounding towns.



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