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Is the Puerto Rican Parrot Worth Saving? The Biopolitics of Endangerment and Grievability

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Is the Puerto Rican Parrot Worth Saving?
The Biopolitics of Endangerment and Grievability

Irus Braverman

[We must] increase investment in biodiversity conservation by at least an order of magnitude. . . . Nevertheless, the total costs are small relative to the value of the potential goods and services that biodiversity provides, e.g., equivalent to 1 to 4 percent of the estimated net value of ecosystem services that are lost per year, estimated at 2 to 6.6 trillion dollars. More prosaically, the total required is less than 20 percent of annual global consumer spending on soft drinks.

---McCarthy et al. 2012, 949

[Place Figure 1 here: A Puerto Rican parrot feeds in a flight cage, Iguaca Aviary, El Yunque Forest, Puerto Rico. Photo by author, January 14, 2013.]

Between 1999 and 2009, 17.2 million dollars were spent by state and federal agencies toward the conservation of the Puerto Rican parrot (*Amazona vittata*)—an amount exceeding that spent on any other parrot species (USFWS 2012) and on the majority of birds—but a miniscule of the daily expenditures of consumers on soft drinks. What do these figures teach us about the hierarchies of life on this planet? What is more grievable, Pepsi™ or parrot?

The Puerto Rican parrot stands approximately one foot tall, with bright green feathers, a coal black eye surrounded by white, and red face markings (Figure 1). The only parrot endemic to Puerto Rico, this bird went from an estimated one million birds prior to European colonization, to between 200 and 250 in the mid-1950s (Vélez, interview). The major reason for the bird's decline is loss of habitat and deforestation: the bird relies on old or decaying trees for nest cavities to rear its young, and 90 percent of Puerto Rico was deforested by the mid-1950s (White et al. 2014, 14). The remaining parrot population was confined to the Luquillo Mountains of northeastern Puerto Rico.

By 1973, the total population of the species numbered only thirteen birds, placing it on the brink of extinction by any criteria. At this point, a decision was made to start a breeding population in captivity. "It was a big risk," recalls Jafet Vélez, Iguaca Aviary Manager at Luquillo for the USFWS (interview). To minimize the risk, the team selected eggs and chicks, rather than breeding age adults, and took eleven of those into captivity. All of the captive birds to date are descendants of these eleven founders (Vélez, interview). The first breeding population was established at the Luquillo (now Iguaca) Aviary near the El Yunque Peak in the Caribbean National Forest in 1973. A second breeding population was established in the José Vivaldi Aviary at Rio Abajo in 1993. During the first three years, 34 captive-reared birds were released; 20 or so died, mostly due to predation by red-tailed hawks (*Buteo jamaicensis*).

At first, the captive breeding program produced one to three chicks per year. But by 2000, biologists had become relatively successful at producing parrots in captivity and by 2014, captive breeding produced between 75 and 100 chicks per year (White et al. 2005, 424). What accounts for this incredible success is El Yunque's intense reliance on experiments with a closely related bird: the Hispaniolan Amazon (*Amazona ventralis*) of the Dominican Republic. Unlike the

Puerto Rican parrot, the Hispaniolan is not listed as endangered and has therefore served as a convenient surrogate for experimentation (White, interview). From 1997 to 1999, 49 Hispaniolan parrots were released in the Dominican Republic. At first many died, but through experimentation, a team of scientists learned that the parrot requires both pre- and post-release management to thrive in the wild, including flight training before release, acclimation to release sites, and food supplementation (Collazo et al. 2003). As a result of these findings, for their initial releases in El Yunque, the Puerto Rican parrots were held for at least four months in large flight cages before being transferred to acclimation cages at the release site. Additionally, one month prior to their release, the parrots were allowed to adjust to their surroundings while undergoing a three-phase training to recognize hawks and other threats. Using progressively stronger stimuli—first, a hawk call and a silhouette of a hawk moving in the sky above the cage, then an actual fly-over by a trained hawk, and finally a hawk attacking a tethered (protected) Hispaniolan for the caged parrots to see—the researchers sensitized the parrots to the sights and sounds of hawks. After this experimentation, 84 percent of the parrots showed increased vigilance that would, so the experts hoped, help them survive in the wild (White et al. 2014, 112).

To optimize genetic diversity, the parrots are routinely moved between the wild and captive populations in each aviary as well as between the two aviaries. Olivieri explains: "We move chicks and eggs from one population to another" (interview). For example, infertile wild birds are given captive eggs to foster (Olivieri and Valentin, interviews), and Hispaniolans with a track record of success as foster parents raise eggs from Puerto Rican parrots that have recently laid eggs but have not proven successful at laying fertile eggs, impelling the endangered parrots to lay another clutch, and thus doubling their chance of successful reproduction for the year (Vélez, interview). In addition to knowing, tracking, and monitoring the Puerto Rican parrots to the finest detail, a computer program also recommends their optimal pairing (Vélez, interview).

In 2014, there are 300 parrots in Puerto Rico, 58 to 80 of them living in the wild (Serrano 2012). At the same time, an estimated 225 hawks live within the El Yunque forest, making it the highest hawk population density in the western hemisphere—and a persistent threat to the released parrots. The red-tailed hawks are legally protected under the Migratory Bird Treaty Act. To negotiate the conflict between the Migratory Act and the Endangered Species Act, a permit was granted through the Migratory Bird Treaty Act that allows the US Fish and Wildlife Service (USFWS) to "take" (in this case, kill) up to 24 hawks a year to protect vulnerable parrots. In the words of one of the program's managers: "[We] carefully monitor fledglings at nest sites when they are most vulnerable and shoot hawks that seem to be about to prey on them. . . . The [adults] have survived for many years so they know how to evade the red-tailed hawk, but the babies—they don't" (López-Flores, interview). "We only take it [the hawk] when one of those animals [are] going to take a parrot," another of the program's managers explains (Muñiz, interview).

The parrot-hawk conflict is duplicated across conservation projects around the world and is often a characteristic component of this kind of work—namely, engaging in killing in order to make live. Under this as well as so many other conservation projects, species lives that matter less are made killable in the service of the life of the grievable species. The story of the Puerto Rican parrot's conservation also demonstrates the complex and overlapping legal and economic regimes and the hyperregulation of endangered life. It shows the differential treatment between lives that matter more and are thus funded more generously and assigned higher protection levels (endangered parrots, and fledglings in particular), and those that matter less and are thus less protected (the Hispaniolans and the red-tailed hawks). The species conservation paradigm, while centered on affirmative "make live" projects for threatened species, is thus inevitably a story of violence and death for the not (or less) threatened ones. The threat of extinction is not only a subject of grief but also a motivation to "make live."

A few words on the structure of this chapter. After a brief discussion of the project of governing species through the act of listing, I examine the list as a biopolitical technology and its application to nonhuman animals. Next, I focus on the "mother" of all threatened species lists—the IUCN Red List—and its economic dimensions. Finally, I discuss interrelated incentives such as the lists of the Alliance for Zero Extinction (AZE) and Evolutionarily Distinct and Globally Endangered (EDGE) of the Zoological Society of London. The ethnographic focus of this chapter conveys the biopolitical paradigm that lies at the heart of species conservation and its underlying economic, regulatory, and ethical convictions.

Governing Species

As the Puerto Rican parrot example shows, the act of listing threatened species impacts the life and death of actual, embodied animals. While recognizing these functions and effects on the individual level, this chapter focuses on the management of life at the level of the biological *species*, what Foucault refers to as biopolitics, as distinct from (yet entangled and coproduced with) anatomo-politics (Foucault 1990). In other words, I examine how the practices of assessing and listing nonhuman species translate into particular knowledges of species, as connected with, yet distinct from, knowledges of individual animals and populations. I also explore how economic logics intersect and impact such knowledges.

The project of governing species sits somewhere between that of governing individuals and that of governing statistical populations—and corresponds with both. Unlike Foucault's abstract population (which, I should point out, is different from the understanding of a population in the conservation context, typically as a unit smaller than a species), a species has a face and a context; it is situated—as becomes clear from the narratives of conservation experts. Put differently, thinking and governing through species regimes enables both an abstraction—a grid over the Linnaean kingdoms (Foucault 1970)—and an embodiment: a personification of ecosystems, habitats, and populations. Since humans understand themselves primarily as a species and therefore both relate to, and differentiate themselves from, other species—it is important to critically examine this lens and the work that it performs in the world.

For conservation scientists, the species is the foundational ontological unit for knowing and calculating life, or viability (Braverman 2014; 2015; Sandler 2012). Biermann and Mansfield reflect on the perspective of conservation experts that: "Managing individual nonhuman lives is meaningless in responding to the crisis of biodiversity loss; individual lives acquire meaning only when they advance the long-term well being of the broader population or are essential to sustaining key biological processes, especially evolution" (2014, 264). According to this way of thinking, the death of an individual gains meaning and grievability status according to the level of endangerment of the species: once on the brink of extinction, for example, the individual becomes larger than a singular life, and her or his death is therefore more grievable than a singular death: it becomes the death of a life form, the death of nature. While many scholars theorize grievable life in the context of the individual, this project importantly documents the ways in which grievability occurs at the scale of the species. What does it mean for *Homo sapiens* to grieve the loss of a nonhuman species? How might this type of grief differ from a sense of grief about the loss of biodiversity more generally? And what role does grief play in differentiating between species and creating a hierarchy of grievable life, whereby certain species get legal protection and financial support—but others do not?

Alongside the affirmative "make live" emphasis of threatened species lists, the deaths of so many other life forms who are not rare, charismatic, or visible enough to warrant the "threatened" designation fall outside the range of protections established by the list, or outside the list altogether. Such life forms are effectively "list-less": incalculable, unmemorable, and thus killable. Toward the end of this chapter, I argue that the conservation value of a species is defined through its inclusion and rank in an increasing number of lists and that the power of such lists is constantly eroded as new lists take their place in defining what is even more threatened, endangered, or extinct.

Foucault refers to the project of differentiating between what must live and what must die as "racism," as I shall explain shortly. This chapter provides a more nuanced reading of Foucault's 'racism,' and how it extends to nonhuman animals. It points to the speciesism in Foucault's framing of biopolitics and racism, putting forward a discussion of these concepts that is anti-speciesist. Specifically, my project illuminates the immense regulatory and economic powers of threatened species lists and their heightened focus on, and differentiation of, life. I argue that in addition to reinforcing the biopolitical differentiation between perceivably distinct nonhuman species, threatened species lists also reinforce the biopolitical differentiation between human and nonhuman species, with the human never being subject to the threatened list. Such a differentiated, or 'racial,' treatment of the life and death of species through their en-listing, down- and up-listing, multi-listing, and un-listing translate into the positive protection and active management of nonhumans. Threatened species lists are thus biopolitical technologies in the battle against biological extinction. Listing threatened species becomes a way to affirm—and justify—that life which is more and most important to save.

While an increasing portion of biopolitical work is centered on thanatopolitics or necropolitics, this project brings into focus an affirmative biopolitics (Braidotti 2013; Rutherford and Rutherford 2013, 426), namely "the ways in which biopolitics can be more about life than death, about inclusion rather than exclusion" (2013, 429). What happens to those list-less lives that fall outside the realm of the threatened list does not figure within this account, which focuses instead on the viability of the listed. But such a focus on the affirmative does not entail a disavowal of death. Quite the contrary, as Biermann and Mansfield argue, "to *make live* does not mean to avoid death altogether but to manage death at the level of the population. In a biopolitical regime, death is transformed into a rate of mortality, which is open to intervention and management. This transformation erases the fact that not all life is equally promoted" (2014, 259). For the list-less, the rule is typically the non-application of protection and the phasing out of support, although it can include much more explicitly sovereign methods when pertaining to certain species, especially those that threaten the purity of the listed (e.g. Gila and rainbow trout or crested and marine toads; Braverman 2015). But while the Red List's redness intends to alert us of the dire state of those species that are listed as threatened and to the intensified management of their mortality rates, it fails to alert us of those species and individual animals who have been marginalized in the process of saving the chosen ones (Braverman 2015).

The Biopolitics of Species Conservation

Michel Foucault's concept "biopower" helps make sense of conservation's extensive use of species ontology and its focus on calculations of rarity in practices of listing life. In the pre-modern period, sovereign power was characterized by the "the right to decide life and death," that is, the right to *take* life or *let* live (Foucault 1990, 135-6). Foucault argues that this ancient right has been replaced by a "power to *foster* life or *disallow* it to the point of death" (138). He defines this new "power over life"—which he sees as emerging in the eighteenth century with the development of bourgeois society and capitalism—as "biopower." In his words: "Power would no longer be dealing simply with legal subjects over whom the ultimate dominion was death, but with living beings, and the mastery it would be able to exercise over them would have to be applied at the level of life itself; it is the taking charge of life, more than the threat of death, that gave power its access even to the body" (142-3). Power, Foucault argues, no longer has death as its focus, but rather the administration of the living: "Such a power has to qualify, measure, appraise, and hierarchize, rather than display itself in its murderous splendor" (144).

Although Foucault uses the term biopower to describe the project of governing *human* bodies, populations, and life (see also Rabinow and Rose 2006; Rose 2001), my work draws on growing scholarship that expands this notion to the governing of nonhuman animal species and populations (Friese 2013; Haraway 2008; Rutherford and Rutherford 2013; Shukin 2009; Wolfe 2013). Within this scholarship, limited attention has been paid to the role of race in the biopolitical differentiation of nonhuman life (but see Biermann and Mansfield 2014, 261).

Foucault refers to the break between the livable and killable as "racism." According to this definition, the death of the other improves life as a whole. In other words, death is a means to foster life. Foucault writes: "racism justifies the death-function in the economy of biopower by appealing to the principle that the death of others makes one biologically stronger insofar as one is a member of a race or population, insofar as one is an element in a unitary living plurality" (2003, 258). He continues: "The enemies who have to be done away with are not adversaries in the political sense of the term; they are threats, either external or internal, to the population" (256).

The project of racism, as Foucault defines it, is crucial for explaining the distinction between list-less and listed life. The source of the difference between human- and nonhuman-focused lists is evident when examining them through a biopolitical lens: according to Foucault, only (certain) humans are privileged with political life. Animals and plants, along with all that is considered natural or wild, are relegated to the realm of biological life—namely, that which is killable. By contrast, this chapter applies the distinction between biological and political life also in the nonhuman context. Through their listing as threatened, certain species lives are elevated to a political status, while the rest (initially at least, the unlisted) remain biological, or mere, life (Braverman 2015).

Unlike for Foucault, however, in the context of threatened species management, the "list-less" population is ostensibly that which is *not threatened*, and not necessarily that which threatens. Rather than posing a biopolitical threat to the flourishing of listed populations, certain list-less populations simply remain killable, whereas the threatened ones are elevated into a grievable status. However, certain list-less species are downgraded to the category of "invasive," "hybrid," or "nuisance," posing a more typically biopolitical threat to the purity of the protected species. These inter-species threats become subject to forms of control by humans, such as elimination or purity management (Braverman 2015). Threatened species lists are about creating, calculating, and re-performing that line between nonhuman lives that are killable and those lives that must be cultivated and grievable.

The IUCN Red List for Threatened Species™

IUCN's Red List is the first modern comprehensive global attempt at listing threatened species. The IUCN has been producing Red Data Books and Red Lists since 1963 (Lamoreux et al. 2003, 215). Despite the insistence on the part of many IUCN scientists that the Red List is not prescriptive (Hoffmann, interview), all agree that it has had profound influence on conservation practices and practitioners around the world (Possingham et al. 2002; Rodrigues et al. 2006). Specifically, the Red List has inspired the development of numerous national and regional red lists and functions as an important source for the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)—a powerful international convention on trade (Miller 2013) that determines whether and how trade in certain species will be regulated.

The Red List is by far the most influential and widely used method for evaluating global extinction risk. It has been in use for five decades, and has evolved during this period from a subjective expert-based system lacking standardized criteria to a uniform rule-based system (Miller 2013, 195; Mace et al. 2008). The IUCN revised its risk-ranking system into data-driven quantitative criteria in 1994 and finalized these categories and criteria in 2001 (IUCN 2001a; see also Mace et al. 2008). The current system is designed to provide "a standardized, consistent, and transparent method for assessing extinction risk, thereby increasing the objectivity and scientific credibility of the assessments" (Miller 2013, 195).

The Red List classifies taxa into eight categories: Extinct, Extinct in the Wild, Critically Endangered, Endangered, Vulnerable, Lower Risk, Data Deficient, and Not Evaluated (IUCN 1994). The system consists of one set of criteria that are applicable to all species and that measure the symptoms of endangerment (but not the causes). The three IUCN Red List threatened categories are Critically Endangered, Endangered, and Vulnerable. Five criteria, listed A through E, are used to categorize a taxon within these threatened categories. Although the other categories are formally listed, they are not assessed in the same manner, hence being "less" listed, or "list-less." The threatened criteria are: A) a reduction in population size; B) a small, reduced, fragmented, or fluctuating geographic range; C) a decline in size of an already small population; D) a very small or restricted population; and E) a quantitative analysis indicating the probability of extinction. To be listed as Critically Endangered, for example, a species must decline by 90 percent or more, cover less than $100km^2$, or consist of fewer than fifty mature individuals (IUCN 2001b). A species need only satisfy one criterion to be listed. Each of these categories contains a list of species, which can be traced in the Red List's online database, with one exception: the category of Not Evaluated includes no taxa (IUCN 2013a), literally establishing a list-less life. List-less, because when a species is not evaluated, it is devoid of human protection, thereby remaining mere life. Generally speaking, then, the further the species is ranked away from Extinction, the more unseen it is from the list's perspective and the more killable it is.

Place Figure 2 here: The structure of the IUCN Red List Categories, reprinted from http://www.iucnredlist.org/static/categories_criteria_3_1. Source: The IUCN Red List of Threatened Species © IUCN

Watson says generally about the rigid criteria of the Red List, and of threatened lists more generally, that: "At the end of the day, all listings are arbitrary: they're not driven by the laws of physics, they're actually created . . . by humans trying their best to develop the most appropriate categories according to the best available knowledge" (interview). Yet alongside its reliance on fixed and rigid standards, the Red List also enables flexibility and change. Accordingly, the number of species listed in each category changes every time it is updated (on the books, every five years). This is a result of various factors, including species being assessed for the first time, species being reassessed and moved into a different category of threat, and taxonomic revisions. The IUCN distinguishes genuine (namely, real changes in threat levels) from non-genuine (namely, technical changes in threat levels that result from error, taxonomic revisions, or changes in threshold definitions) reasons for revising the listing (IUCN 2013b). The ever-changing nature of the list makes it even more powerful, as no protection, or un-protection, is ever fixed or settled and thus there is constant reliance on the listing process.

In its aspiration to comprehensiveness, simplicity, comparability, consistency, objectivity, and credibility, the Red List is a perfect example of the effectiveness of the list as a biopolitical technology. By 2013, the IUCN Species Survival Commission network—which is comprised of thousands of scientists and experts from around the world—evaluated the global threat status of 71,576 species of animals, plants, and fungi (IUCN 2013c). The aim: to assess and appropriately categorize every living species (IUCN 2001b). Mike Hoffmann clarifies, accordingly, that the Red List of Threatened Species is in fact not just about threatened species, but about *all* species. "You can't talk about the status of biodiversity globally unless you've assessed everything," he says. Nonetheless, he is first to admit that "we have lots of biases," explaining that the system is "still very much biased towards vertebrates" and that "plants, fungi, and invertebrates are underrepresented" (interview). "We've got a long way to go," he says about the current state of the Red List.

Generally, the assumption is that the simpler the categories and criteria, the more they can be applied across the board to the various taxa on the list. Indeed, the criteria and categories "are designed to apply whether you are a mammal or a bird or a fungus or a plant or whatever you are" (Hoffmann, interview). For example, Criterion D requires a threshold of fewer than 50 mature individuals (IUCN 2001b); this number applies to all taxa, from fungi to whales. The application of scale in the IUCN criteria of geographic range (Criterion B) surfaces the problems of this "one size fits all" approach. The IUCN cautions that: "The choice of scale at which range is estimated may thus, itself, influence the outcome of Red List assessments and could be a source of inconsistency and bias. It is impossible to provide any strict but general rules for mapping taxa or habitats; the most appropriate scale will depend on the taxon in question, and the origin and comprehensiveness of the distribution data" (IUCN 2001b).

Nonetheless, the central idea of the Red List "was to come up with one system that is applicable across all taxa, and you can therefore make *comparisons* across your different taxonomic groups" (Hoffmann, interview). In addition to the heightened comparability between different taxa, the Red List provides comparability within a particular taxon over time. It makes possible grand calculations such as this one: "On average, 52 species of mammals, birds, and amphibians move one category closer to extinction each year"; or this: "the deterioration for amphibians was equivalent to 662 amphibian species each moving one Red List category closer to extinction over the assessment period, the deteriorations for birds and mammals equate to 223 and 156 species, respectively, deteriorating at least one category" (Hoffmann et al. 2010, 1507).

Place Figure 3 here: The IUCN states that, "Coral species are moving towards increased extinction risk most rapidly, while amphibians are, on average, the most threatened group." From http://www.iucnredlist.org/about/summary-statistics. Source: The IUCN Red List of Threatened Species © IUCN

The Red List's power lies also in its touted objectivity, transparency, and repeatability (namely, that if another expert were to conduct the assessment he or she would reach the same listing conclusion; Brooks, interview). According to Hoffmann, the biggest source of bias is when scientists want to list "their" species as threatened, "because they're worried that if it's not, they're not going to get money." The reverse also happens, with researchers who prefer that their species be listed as Least Concern "so that they can collect their species, put it in a specimen jar, and do research on it." "Our job," Hoffmann tells me, "is to be the neutral, objective, adjudicators of that process." IUCN's Standards and Petitions Subcommittee is the particular adjudicator in cases of disagreement over a Red List designation. According to Hoffmann, they are "the experts in the criteria, and what they say . . . would essentially be considered gospel" (interview).

This brings me to the issue of the Red List's credibility. Barney Long is director of Species Protection and Asian Species Conservation at the World Wildlife Fund and a member of the IUCN World Commission on Protected Areas. Long tells me, "[W]hen you say this species is red listed by the IUCN as Critically Endangered, everyone automatically agrees and accepts that. There's no conversation, because the experts have agreed that it is Critically Endangered" (interview). Today, the IUCN Red List is considered one of the most authoritative sources of information on the global conservation status of plants and animals (Lamoreux et al. 2003). Its reach has extended into numerous national and international regulatory systems. According to Miller, 76 countries use the IUCN methodology for their national red lists (Miller 2013, 197). Hence, "[f]rom its origins as a general interest in rare and declining wildlife, the science of threatened species assessment has blossomed into a massive conservation theme with far-reaching influence on conservation on the ground" (Miller 2013, 200).

But there are also adverse affects to certain listings. Brian Horne, turtle conservation coordinator at the Wildlife Conservation Society, tells me in an interview that collectors often "want the rare, and the unusual and different." Hence, when turtle breeders learned that a certain turtle species was soon to be listed under CITES' Appendix I, their prices increased dramatically. "The turtle went from being a hundred dollar turtle to [costing] one thousand dollars." Another result is that once a species is downlisted (the term used to indicate that it has become less threatened), "you become a victim of your own success . . . because suddenly there's less funding sources available," which could in turn easily translate into less protection (Bennett, interview). Another example is that the price of rhino horn on Korean markets increased by more than 400 percent within two years of their uplisting from CITES Appendix II to Appendix I, which in turn coincided with a sharp increase in the poaching of black rhinos and in illegal trade in rhino horn (Rivalan 2007, 530). The listing process thus makes a difference for the lives of animals in myriad, at times counterintuitive, ways.

The Economies of Endangered Life

"Why save endangered species?" asks a brochure by the U.S Fish and Wildlife Service (USFWS 2005), the agency charged with enforcing the Endangered Species Act, which establishes the American version of a threatened species list. Alongside the myriad biological and emotional benefits, the brochure emphasizes an array of economic reasons, stating that: "No matter how small or obscure a species, it could one day be of direct importance to us all." A central economic benefit of saving species is for the pharmaceutical industry: "it was 'only' a fungus that gave us penicillin, and certain plants have yielded substances used in drugs to treat heart disease, cancer, and a variety of other illnesses. More than a quarter of all prescriptions written annually in the United States contain chemicals discovered in plants and animals. If these organisms had been destroyed before their unique chemistries were known, their secrets would have died with them." The "make live" of nonhuman species is thereby rendered beneficial for the "make live" of humans. In addition to the medical benefits, the brochure also details a variety of agricultural ones, finally noting that wildlife watching in the U.S. "generated 85 billion dollars in economic benefits to the nation in 2001" (2005).

Mike Parr is the Chair of the Alliance for Zero Extinction as well as the Vice President of Planning and Program Development at the American Bird Conservancy. Parr argues for the importance of lists beyond their economic value. "There's a value to it that is not economic; it's intangible, probably," he tells me in our interview, concluding: "if we don't do something about it now, people will find that hole that's left in our collective soul and be mournful of it" (interview). From Parr's perspective, acts of listing life are tied to our essential biophilic needs and desires as humans. The process of listing a species as threatened thus elevates that species from a killable to a grievable status.

The use of species as the foundational unit of threatened lists, effectively rendering them the "currency of conservation" (Lamoreux, interview), is not only ideological but also pragmatic. First, threatened species are "among the most visible and easily understood symbols of the rising tide of extinctions," making them an "emotive and politically powerful measurement of biodiversity loss" (Miller 2013, 192; see also Wilson 1992; Wilcove 2010). In other words, species are the personalization—the individuation even—of populations and ecosystems. Using the species scale thus enables conservationists to put a face onto less apparent extinction processes and losses. Additionally, species are the most common and easily quantifiable unit for assessing the state and the costs of biodiversity.

The lists' utilization of the species unit not only implies equality among species but also their equality and comparability. The Red List, for example, is "applied to grasshoppers as well as blue whales," Lamoreux tells me. "There's something about the applicability across all groups that's just truly amazing," he adds. Yet some listed species end up being more equal than others. Lamoreux explains, for example, that, that "even if you list a whole lot of dragonflies on the Red List, they're not going to suddenly get as much attention as a panda." He clarifies: "they're not all equal in the eyes of conservation funding or conservation action" (interview). James Watson is president-elect of the Society of Conservation Biology and head of Climate Change Project at the World Conservation Society. Watson points out that of 1,600 species on the Australian threatened list, only 35 percent receive government funding for conservation. "The things which get money are birds and mammals, and the things which don't get money are butterflies and plants," he tells me in an interview. The economic logics of fundable species conservation projects are thus dictated by, and entangled with, the species' level of grievability, both resulting in the racial differentiation between threatened species. Indeed, even the listing of a species as threatened does not promise it equal protection in relation to other listed species. Various criteria, and less formal lists, in fact determine which species are more or less worth saving.

Threatened species lists are now everywhere. National agencies routinely make choices on resource allocation among species based on these lists, typically allotting more funding to species listed in the highest threat categories (Possingham et al. 2002, 503). And although the Red List administrators insist that the list is scientific and apolitical and does not establish priorities between species, conservation biologist Arne Mooers tells me that even "the conservation community mistakenly considers probabilities of extinction as representing worth" (interview). For this reason, certain conservation scientists have been advocating for alternative or additional lists that openly justify the differentiation and prioritization between species, as I shall discuss shortly.

Conservationists show that saving endangered species is economically-wise; but how much would it cost to save them—and are they worth this investment? In a 2012 article in the prestigious journal *Science*, Stuart Butchart and colleagues attempted to answer these and related questions (McCarthy et al. 2012). To assess the costs of species conservation, they sampled 211 globally threatened bird species (19 percent of all threatened bird species on the Red List), asking experts to estimate the costs for conservation actions needed to achieve the minimum improvement in status necessary to reclassify ("downlist") each species to the next lowest category of extinction risk on the Red List. Based on this assessment, the study estimated the cost of reducing the extinction risk of all globally threatened bird species by one Red List category to be approximately one billion dollars every year for the next decade. The scientists found that only 12 percent of this amount is currently funded. They further indicate that:

> Even with increased investment, careful prioritization will continue to be necessary to inform decisions about which areas to protect and which actions to undertake for species. . . . Our finding that species facing higher categories of extinction risk require less investment for downlisting than do those in lower categories suggests that in many cases such analyses will prioritize actions for the most-threatened species first. We also note that there is considerable global spatial variation in costs and the number of threatened

> species per unit area. Although the shortfalls in higher-income countries are substantial, the greatest gains per dollar will be in lower-income countries. Despite the limitations of the available data, the shortfalls we have identified clearly highlight the need to increase investment in biodiversity conservation by at least an order of magnitude, especially given the small, but growing, body of evidence linking spending and effectiveness. A particular challenge will be how to address the current mismatch between the greater resources available in richer countries and the higher potential conservation gains in financially poor, biodiversity-rich countries. (McCarthy 2012, 949)

This text exposes but a tip of the iceberg from the complexities of calculating conservation costs and funding on a global scale, illuminating some of the nuances of how conservation is affected by the disparity between poor and rich countries. The article concludes more generally that: "Resolving the ongoing conservation funding crisis is urgent; it is likely that, the longer that investments in conservation are delayed, the more the costs will grow and the greater will be the difficulty of successfully meeting the targets" (ibid.).

Clearly, the economic dimensions of species conservation are an important and highly complicated, yet surprisingly understudied, part of the biopolitical project of endangerment. Hoffmann tells me along these lines: "there are not many studies that investigate, quantitatively, the impact of listings" (interview). He notes two exceptions: in the United States, recent analyses of recovery plans based on Endangered Species Act listings suggest that there is a positive relationship between funding and trends in species status, and a study of threatened bird recovery programs in Australia for the period between 1993 and 2000 found that where funds have been dedicated to the conservation management of threatened bird taxa, they have produced positive results. "Although more threatened birds declined than increased," the Australian study noted, "many stayed stable over the study period when they might otherwise have become more threatened or gone extinct" (Garnett et al. 2003, 664).

Other Lists

The last two decades have witnessed an explosion of national lists of threatened and endangered species (see, e.g., de Grammont and Cuarón 2006, 22). In 2010, at least 109 countries had produced a national red data book, national red list, or other national list of threatened species (Miller 2013, 198), and at least 25 listing systems of threatened species were used across North America (192). Of the myriad threatened species lists, Miller writes, some "are designed purely to evaluate risk of extinction, whereas others focus on ranking species to receive priority conservation attention" (Miller 2013, 194).

Yet alongside the proliferation of lists, a critique of existing listing processes has also emerged. In the words of James Watson: "The conservation field is dominated by ecologists who really like to make lists." But "conservation is also not just about *listing* something," he continues, "it is about *doing* something." "This is not a failure of the list itself," he explains, "it's the failure of the conservation community to develop other metrics beyond the list" (interview). Joseph et al. (2009) argue along these lines that existing approaches in conservation typically "ignore two crucial factors: the cost of management and the likelihood that the management will succeed" (328; see also Bottrill et al. 2011; Possingham et al. 2002; Walsh et al. 2012).

If the Red List focuses on identifying threatened species, other lists supplement this by identifying alternative targets for maintaining biodiversity. The Alliance for Zero Extinction (AZE) has identified 588 sites that serve as the single remaining location for species listed as Endangered or Critically Endangered under the IUCN Red List (AZE 2013). Of 20,934 of such species, the AZE has mapped 920 species, implying that these are the world's *most* threatened species (AZE 2013). Mike Hoffman explains that, "These are the places where, if you don't do something here, now, for this species, you're going to lose a species" (interview).

In 2013, the AZE released the results of the public poll for the winners of its "7 Wonders" campaign, which highlighted the seven *most* representative sites and species around the world (Figure 4). The press release described a few of the seven selected species: "A two-inch long frog so deadly that its toxin could kill ten people; a bat that is called a flying fox with males that defend a harem of up to eight females; and an enigmatic, fist-sized owl that was discovered in 1976 only not to be seen again for 26 years" (AZE 2013). "This is really a story of survival, not one of extinction," director Mike Parr was quoted saying, "but we must recognize that many of these species do still need an extra helping hand if they are to survive into the future'" (AZE 2013). The focus of the listing project is, again, on life rather than death. This is an affirmative biopolitics that promotes nonhuman survival and that resists extinction based on human care and founded on detailed calculations. Conservation's extensive "trust in numbers" is reflected in the narrative that describes the selected species (2 inches, 10 people, 8 females, 26 years).

Place figure 4 here: AZE's 7 Wonders poster. Credits clockwise from upper right: Juan Fernandez Firecrown by P. Hodum; Lear's Macaw by Ciro Ginez Albano; Long-whiskered Owlet by ECOAN; Roti Island snake-necked turtle by Anders G.J. Rhodin; Siberian Crane by Gunnar Pettersson; Golden poison frog by ProAves; Rodrigues flying fox by Vladimir Motyuka. Courtesy of Mike Parr.

Another listing initiative that has emerged in recent years is EDGE of the Zoological Society of London (ZSL), which focuses on Red List species that possess a significant amount of unique evolutionary history. The EDGE idea draws on the phylogenetic diversity (PD) concept (Faith 2013). From the ZSL website: "We have scored the world's mammals and amphibians according to how Evolutionarily Distinct and Globally Endangered (EDGE) they are." "These are the world's most extraordinary threatened species," the website notes, "yet most are unfamiliar and not currently receiving conservation attention" (EDGE 2013).

However, biodiversity expert Arne Mooers tells me that the PD framework could provide a more dynamic—and thus a better—list than EDGE because of its ability to run multiple scenarios with various sets of groups. Mooers provides the example of the kiwi bird from New Zealand to explain the differences between PD and EDGE listings. There are three kiwi species that "aren't related to anything else on the planet," he says, which determines their high PD score. "But even though as a group, they are fifty million years . . . distantly related to everything else, amongst themselves they're surprisingly closely related," he explains. "So if you saved any one of them, and let the other two go extinct, . . . all [of] the 'kiwiness' would still be there, in that one species" (interview). Mooers tells me, accordingly, that all three species rank highly on the EDGE list, but that the result would be different under a PD analysis.

In his words: “you might be wasting your time trying to conserve all three of them, when really you should conserve only one.”

The “making live” and “letting die” decisions embedded in the kiwi example demonstrate the function of lists as technologies for triage decision making. “Like in emergency medicine, triage involves using criteria to assess priority and make life or death decisions, not about human beings but about the futures of entire species” (Biermann and Mansfield 2014, 266). In this particular context, the triage was dictated by the evolutionary uniqueness of the species. The reason for all triage decisions is limited resources; if resources were bountiful, one assumes, all valued lives would be saved. But unlike triage decisions in the human context, where higher chances of survival (rather than biological, economic, and social importance, for example) determine the decision, in the case of endangered species often the most threatened species (namely, the one with the highest risk of dying out) receives the highest conservation priority.

Epilogue: The Politics of Listed (and List-less) Life

Traditionally, animals and plants—along with all that is considered natural or wild—have been confined to the realm of biological life: namely, to that which is killable. Conversely, humans have been privileged with political life. This chapter has described how species lists elevate listed nonhuman species from the realm of biological life into that of a political life worth saving: laws are put in place to protect life forms belonging to threatened species from being killed or harmed, databases are configured around their most recent census, costs are calculated and funding is allotted according to complex factors, and those last individuals of such species who die despite the efforts are deeply grieved. My study of threatened species lists thus provides a novel perspective on biopower that highlights both its affirmative properties and its acute relevance for understanding the management of entire nonhuman species, offering a critical examination of the species as a governable unit.

The focus of the listing project is on a species *life* rather than on its *death*. At the same time, it is also about figuring out which species life should be privileged in this endeavor, and which can be let or made to die. But rather than a bifurcated understanding of life versus death, threatened species lists parse the life of species into much more complicated orderings according to their risk of extinction. The endangered list thus not only oscillates between life and death, or between political and biological life; it also elevates certain nonhuman species over others, effectively establishing a gradation of animal bodies that are both worth living and worth grieving.

This chapter has explored but a few of the myriad threatened species lists that are currently proliferating in various organizational and regulatory platforms. In particular, I have focused on the IUCN Red List for Threatened Species, the foundation for all modern threatened species lists. Despite their common origin, the various lists differ in their perspective on what is most important about life and thus on what is most worth saving, whether rarity in numbers, unique territorial configurations, evolutionary (phylogenetic) variation, or high viability rates.
Even among those species who are deemed threatened, then, categories and criteria prioritize the ones who are perceived to be *the most threatened of all*: those whose lives are even more, and finally most, worth saving.

The Puerto Rican parrot is one such example. In 1973, there were only 13 Puerto Rican parrots left in the world. After four decades of intensive work and an investment of millions of tax dollars, 300 parrots have survived. During the same period, many other endangered birds became extinct. Why save the parrot rather than other endangered birds? And how much is the Puerto Rican parrot species worth or, in other words: what is this species' projected grievabililty level if it becomes extinct?

In 2011, leading Australian ecologist Corey Bradshaw and his colleagues challenged the tendency in conservation to invest in iconic and charismatic species who live on the brink of extinction, calling instead for the application of a mathematical Species' Ability to Forestall Extinction (SAFE) index that reflects the species' level of viability and its risk of extinction (Clements et al. 2011). Bradshaw's argument became highly contentious because he was quoted suggesting that it might not be worth trying to save the kakapo (*Strigops habroptilus*), a critically endangered native New Zealand bird that has been on the brink of extinction for decades (Science Media Centre 2011). Bradshaw clarified his position: "Some species require an enormous amount of resource investment to make them even survive in the low levels that they already are at." "I am just questioning whether species like that deserve millions of dollars in investment," he concluded (Radio Live 2011). Such and many other species conservation debates are illustrative of the biopolitical logics of listing and of the complex relationship between killability, grievability, and endangerment that govern them.

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