

THE NATURAL AMBIGUITY OF NATIVE SPECIES

by Jennifer Foster

Mainstream ecological wisdom suggests that native species are essential to the preservation and promotion of ecological health or integrity: they are often deemed to be the ‘natural’, ‘authentic’ and ‘original’ occupants of particular habitats. Philosophically and pragmatically, they are generally considered crucial to biodiversity at scales ranging from the local to global. The past five years in particular have witnessed an explosion of publications and workshops expounding the virtues of native species as the rightful residents of bioregionally defined locales, to the extent that commercial chain nurseries have even caught on and showcase native species from their stock. In contrast, exotic species are commonly framed as artificial invasives that present fraudulent accounts of nature. As Stephen Murphy remarks, exotics are both symptoms and causes of ecological degradation (Murphy 1999). Where native species evoke ecosystem quality, exotic species suggest devastation. However, upon scrutiny, classifications of exotic and native species (and adjoining assumptions) may be shortsighted and superficial. By constructing native species as more natural (and ecologically more desirable) than exotic species, a particular set of values is engaged that situates humans as arbiters of authenticity in settings where authenticity is irrelevant to shifting ecosystem dynamics. Rather than constructing dichotomous and absolute categories of native and exotic species, it is more useful to conceptualize species as occupying varying and shifting roles within complex environmental relationships. Decisions that favour native over exotic species should not rely on a single tenuous criterion of “naturalness,” but should reflect more nuanced evaluations that are ecologically and culturally contextualized. This essay investigates distinctions between native and exotic species by considering how they play out in the field of ecological restoration. The essay first presents challenges to the “native species are best” position from within realist ecological studies and practice, and then profiles ethical and cultural constructivist challenges to the position.

Removing exotic species and replacing them with native species has become a *pro forma* objective for even the most elementary terrestrial and aquatic restoration projects. The rationale is not only that native species perpetuate global biodiversity by supporting local biodiversity, but that they are adapted to local rainfall levels and have evolved in association with other biotic and abiotic features. Therefore, native species are better equipped than exotics to cope with drought, disease and insects and generally require less maintenance (Johnson 1995). Meanwhile, the ecological impacts of invasive species have been well documented, and there is good reason to be concerned about displacement of native species and habitats, impacts on related species and reduced genetic diversity

(for example see McNight 1993; Pimentel et al. 1999; van Driesche and van Driesche 2000). Exotic removal with native replacement is a strategy widely endorsed by institutions ranging from the Waterfront Regeneration Trust in Toronto to the Evergreen Foundation. But who gets to decide which species are exotic and which are native? These categories may appear straightforward, and they are certainly presented as such to eager weekend restoration participants lined up with work-gloves and shovels, ready to save a local site. However, even cursory probing of the categories reveals that they are not as cut-and-dry as initially assumed.

At a minimum, a species is considered native if it has a historical relationship with a particular terrestrial or aquatic ecosystem. Native species may be depicted as those that have evolved over geological time in response to changes in the physical characteristics and biotic processes of their location, for example resulting from climatic changes, shifts in surface and groundwater, or interactions with other organisms (Leadbeater 2001). As such, all species are native to somewhere, but the term ‘native species’ is generally understood as an expression of legal jurisdiction (for example, a species might be native to a particular province). The term ‘indigenous species’ narrows the geographic scope from state-defined territories to more localized settings, implying species of local origin and therefore adapted to local conditions. Thus, a species may be native to a province but not indigenous to a particular region within that province. For example, species like the Kentucky Coffee Tree or Southern Flying Squirrel may be native to Ontario but not indigenous to the James Bay region of the province. Despite this important distinction, the terms ‘native’ and ‘indigenous’ are regularly used interchangeably, resulting in frequent misattribution of non-indigenous species as historic residents of specific areas.

Exotic (or alien) species are plants and animals that have been introduced from ‘elsewhere’ (external nations or regions). The Society for Ecological Restoration, an international collective of restoration theorists and practitioners, defines an exotic species of plant or animal as one “that was introduced into an area where it did not previously occur through relatively recent human activities” (SER 2002). Exotics are typically sorted into categories of naturalized species, invasive exotics, and cultivars. As aliens that survive and reproduce without human assistance, naturalized species are possibly the least offensive to restorationists, even though they are not generally recognized as part of native plant communities. Naturalized species have “been around a long time” and are somehow appreciated as close to natural because their

direct link to human influence has become less obvious over multiple human generations. In contrast, invasive exotics are the primary target of most restoration efforts. These exotics reproduce aggressively and can displace indigenous plants and disrupt native plant communities by changing the food-web patterns of the invaded community. They are species that outcompete or overexploit other species or modify basic local ecological dynamics. A great deal of attention within the ecological restoration community is devoted to understanding and managing (if not eradicating) invasive exotics, which evoke a sense of ecological panic about environmental ruin and inspire calls for immediate action. A third category of exotic species is cultivars, or varieties of plants created by horticultural practices. Cultivars are often cloned in large numbers from an individual and sold by commercial nurseries. These include everything from showpiece rosebushes to everyday marigolds and begonias. For the most part, they are considered ecologically benign and unthreatening, as they do not reproduce voluntarily. Still, cultivars do occupy habitat and generally require fairly intensive management in terms of soil supplement and watering.

Although categories of native and non-native species may appear forthright, ecological sciences offer no concrete guidance in the categorizing process. Rather, any ordering is an exercise in speculation and judgement about the thresholds for distinguishing between exotic and native species. Underlying the dilemma is the impossibility of determining what constitutes a 'natural' invasion rate, even in general terms (van Driesche and van Driesche 2000). Although humans have helped propel much inter-ecosystem movement of species, particularly given the processes of colonization and globalization that have come to distinguish human occupations of space, we have no baseline against which to measure invasion rates.

The geographic domain of almost any species invariably shifts over time, even if only over the space of several dozen metres. A pivotal development in ecological understanding over the past thirty years is recognition that ecosystems do not exist in a 'static state' or 'static states', but rather in constant states of flux (Pickett and Ostfeld 1995; Forsyth 2003). Landscape patterns and functions are constantly changing, and species migrate in and out of regions and particular settings within regions. As such, the notion of any species residing permanently in a specific place is shaky. Given that both biotic and abiotic circumstances change over time in any ecosystem, conscientious restorationists must confront the question "native at what point in time?" which triggers the question "how local is local enough?" If we recognize the ecological heterogeneity of a typical North American landscape, composed of varying ecosystems knit into a larger landscape pattern, we must also accept that the scale of landscape interpretation can almost always be refined. Does a species qualify as native or indigenous because it is known to have resided two kilometres away one hundred years ago, or should criteria be more exact? Decisions about whether to adhere rigorously to fine-scale locality or allow local generalization thus underlie any native/exotic classification scheme.

Even if we run with the cut-and-dry normative distinctions between native and exotic species, not all restorationists agree that native

species are the only restoration option, or even the best one. In this regard, van Driesche and van Driesche comment that "addressing the impacts of nonnative species in a meaningful fashion requires a measure of discrimination, for portraying all alien species as damaging is counterproductive" (van Driesche and van Driesche 2000: 106). Similarly, Leslie Jones Sauer recognizes impact in terms of degree and context: "how fast it spreads, how widespread it is, and, most important, to what extent it replaces whole communities of native species" (Sauer 1998: 63). To begin with, some exotic species are the only species capable of survival on a particular site. Most landscapes are patchworks of areas where local wildlife has become dependent on exotic and mixed exotic/native ecosystems, and humans have come to depend on many exotics as cultivated crops. Where sites have been severely modified (for example as a result of soil compaction, flood or damage from salt) exotics may present the only viable option for vegetative cover. In situations where native species take a long time to propagate and non-natives provide healthy habitat, the case for elimination of exotics is not strong. Moreover, even if we agree to remove exotic species, successfully doing so is an entirely different matter. Sauer points out that "there are, by definition, no effective natural controls for exotic plants that are currently invasive" (Sauer 1998: 82). Many invasive species are extremely resistant to extermination, often reproducing prolifically after human attempts at starvation, drowning, desiccation, seed destruction, burial, or physical removal. Sometimes the only option available to restorationists intent on elimination of exotics is application of herbicides, which carries a whole new set of environmental problems, contradictions and contentions. What's more, the outcome of an ecological restoration project is not always considered attractive, particularly in the early stages of restoration, and vital public support may be compromised by native species purism. When people want and expect a beautiful site in the short-term they may be demoralized or regard the project as a failure if the results are deemed unappealing. In these instances, introducing horticultural species can bridge the aesthetic gap to maintain public support during early project stages and non-flowering periods.

While normative reasons to resist automatic preference of native over exotic species may be persuasive, there are also profound ethical and value-based dimensions to the argument. From an environmental ethics perspective concerned with understanding intrinsic environmental qualities and environmental beliefs, the artificial/natural dichotomy is not helpful as a classification scheme for exotic and native species because it does not recognize the complex and dynamic circumstances surrounding and affecting specific species or species associations. If artificiality is contrasted with naturalness as the product of intention and design, Eric Katz contends that ecosystem naturalness should be assessed according to the origin (whether or not it stems from human intent), historical continuity (interrupted or uninterrupted ecosystem processes) and authenticity (the combination of origin and historical continuity) (Katz 2000). According to this view, all ecological restoration is artifactual by virtue of human intentionality, regardless of the type of species introduced or purged. It also follows from this view that exotic species are of necessity artifactual, as direct and indirect agents of human intent and as vectors through which origin is contested and historical continuity is

interrupted. Herein lies the reasoning of exotic species' categorization as inauthentic artifacts. However, by reducing naturalness to a single criterion, the absence of human intentionality, Katz presents an unduly simplistic organizational scheme and misses multi-faceted and nuanced interpretations of naturalness (although he does concede that there may be a natural/artificial spectrum). For example, one may argue that an exotic species itself is not artifactual, but its position within an ecosystem may be. Or similarly that planting 'natural', indigenous species inserts an element of artifact upon an ecosystem. It is also unclear whether a native species' naturalness (based on authentic origin and historical continuity) is attenuated where its life system is tied to exotics. Indeed, it is possible to dismiss the category of 'natural', given that the by-products of human intent such as global warming, ozone depletion and acid rain have most likely invaded every earthly nook and cranny, rendering the category of 'artifactual' an irrelevant counterpoint. Rather than commit species to dichotomous categories (or positions along a spectrum) it is more useful to consider artifactuality and naturalness as ideal categories that signal environmental values.

From a value-based interpretation, the link between native species and 'naturalness' must be challenged. That any particular species is not a natural resident of a specific space is never a matter of empirical fact or a purely material phenomenon, but is entirely interpretive and must be fully bracketed within ideological arrangements of what is (or even might be) natural. This relates closely to Neil Evernden's discussion of physical and moral pollution, wherein perception of 'matter out of place' and a system of proper places within the environment (an environmental norm) prompts the use of purported laws of nature to both defend and destroy environmental features or to sanction moral codes (Evernden 1992). He stresses that the theory and practice of ecology are actually irrelevant here, but rather it is the social function of ecology as an authority on 'naturalness' that is of consequence. In a heterogeneous society, not everybody agrees on the proper (i.e., natural) order of things, and Evernden points out that "it is not just the environment that is at risk, but the very *idea* of environment, the social ideal of proper order" (Evernden 199: 6, original emphasis). Where ecology tells us what is natural and healthy, we must question seminal concepts of ecological health and integrity. Bruce Hull and David Robertson explore the construction and use of these very concepts and find them value-laden, imprecise, subjectively interpreted and politically employed (Hull and Robertson 2000). Nevertheless, native species regularly stand as a convenient and popular yardstick for assessment of ecological health and integrity. For example, in a popular guidebook for restoration practice, the Waterfront Regeneration Trust asserts, "those areas with the highest percentage of native species are considered to be the most natural" (WRT 1995: 25). It is not difficult to detect popular and insidious rationales for development where the presence of non-native species certifies a site as already degraded (and unnatural). In such instances, shrewd developers often tip the scales towards development permit approval by promising to improve the biophysical conditions once they are done, by restoring the site with native species and ostensibly 'recovering' it, a value-added argument deplored by Robert Elliot in *Faking Nature* (1997). In these situations, restoration is a

redemptive rationale for development, where developers may gain a foothold in 'degraded' sites with pledges to enhance naturalness by reintroducing native species. Of course, this is not the only way that native species are engaged in restoration work, but it is certainly one that harnesses the artificial/natural divide in ways that support and perpetuate environmentally destructive attitudes and behaviours.

Yet objection to mandatory prioritization of native species may extend beyond assumptions underpinning the concept of naturalness to express different value systems and beliefs. The spread of exotics may be likened to evolutionary change, conceivably a natural process. Some value systems might maintain that we do not have a right to decide what should exist (particularly given human agency in the spread of non-native species). In many cases, exotics are planted for a culturally significant purpose (for example, in memory of a deceased person or pet), and their removal may be considered disrespectful to personally or culturally valued symbols. Attempts at exotics' extinction may also be viewed as analogous to racial and cultural cleansing among humans, and admittedly, many indigenous species purists use language and expressions strikingly similar to that of ethnic purists (see for example, Gröning and Wolschke-Bulmahn 2003).

The point here is not to discredit native species, but rather to question the automatic privilege they often retain in ecological restoration work and to explore the value systems that underpin such privilege. Indeed, there are numerous compelling reasons to emphasize native species: they are well adapted to local biophysical and climatic conditions (at least where these have not been severely altered); they are vital to biodiversity; and awareness of them helps impart a sense of the uniqueness and history of a particular place. By building sensitivity to the ecological details of specific places, we may inch toward more respectful environmental relationships. By considering the social values that inform the ways species are framed, we may become more sensitive and responsive to diverse environmental world-views. But these things will not happen if we gravitate to native species simply because we perceive them to be more natural, and if we lose sight of the important roles that exotic species may play in complex and shifting ecological and cultural dynamics.

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