Do Native Birds Care Whether Their Berries Are Native or Exotic? No.

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During the past several decades, it has been customary to view nonnative species as undesirable, as threats to ecosystems' services and native biodiversity. It is not difficult to call to mind nonnative species that have caused great harm. Introduced pathogens such as sudden oak death, chestnut blight, the rinderpest virus, and the West Nile virus can kill crops, livestock, trees, and humans. The Asian long-horned beetle (*Anoplophora glabripennis*) and the emerald ash borer (*Agrilus planipennis*) have killed millions of native trees in the United States, and the brown tree snake (*Boiga irregularis*) and the Nile perch (*Lates niloticus*) have caused the extinctions of dozens of bird and fish species in Guam and Lake Victoria, respectively. But findings during the past decade have clearly shown that the inherent dangers of nonnative species have been overgeneralized and exaggerated.

Birds and berries

A good example of the dangers of assuming the worst of nonnative species is illustrated by Gleditsch and Carlo (2011), who described the effects of nonnative honeysuckles on native bird species. Several species of nonnative honeysuckles (*Lonicera* spp.) are commonly described as "invading" eastern forests of the United States. The US Department of Agriculture (USDA) has declared them to be invasive (harmful), and their sale is banned in more than 25 states, where the honeysuckles are now frequent subjects of eradication efforts. Oddly enough, the USDA introduced some of these same honeysuckles in the 1960s, 1970s, and 1980s in land reclamation projects and to improve bird habitats, because of the high berry production of the shrubs (Luken and Thieret 1996). Many migratory birds feed primarily on berries in late summer and early fall before migrating south. Berry-producing shrubs, both native and nonnative, have evolved to produce their berries during this premigratory period, illustrating a strong mutualistic relationship between the plants and the birds.

In order to determine whether there was any correlation between honeysuckle abundance and bird abundance in central Pennsylvania, Gleditsch and Carlo (2011) systematically sampled the abundance of both honeysuckles (and their berry production) and birds during the fall (the fruiting season of honeysuckles) of 2009 in a 187-square-kilometer area that included urban areas, agricultural fields, and forested sites, all of which contained honeysuckles. They found a strong positive correlation between the abundance of birds in an area and the abundance of nonnative honeysuckle shrubs. The two most abundant—and also the most highly correlated—bird species were the American robin (*Turdus migratorius*) and the gray catbird (*Dumetella carolinensis*).

Nonnative species detractors might argue that the native berry-producing plants probably suffered because of the predominance of the honeysuckles. Gleditsch and Carlo (2011) tested this hypothesis by putting out pots of black nightshade (*Solanum americanum*), a native berry-producing plant, in areas where honeysuckles were abundant and in those where they were rare. After 20 days, they found that 96% of the native berries were removed in the area where honeysuckles were abundant, compared with only 67% in the low-honeysuckle-abundance area. In other words, even though the birds were eating large amounts of honeysuckle berries, the honeysuckles still enhanced the fruit dispersal of native berry-producing plants. One might call this the *car dealership effect.* It is well known that competing car dealers often situate their dealerships in close proximity to one another, creating a hub of dealerships. The high density of dealerships attracts large numbers of potential customers, and individual dealerships actually enjoy higher customer activity than they would have received if they were situated in isolation. In Gleditsch and Carlo's (2011) study, the abundance of the nonnative honeysuckles allowed a hub to be created with the native species, attracting birds into the area, which then also fed on the native berries. Gleditsch and Carlo (2011) estimated that this area experienced a tripling in the number of fruit-eating birds over the past 30 years because humans have planted large numbers of berry-producing shrubs and trees.

This same phenomenon has occurred in Minneapolis–St. Paul, where I live. Throughout the twentieth century, a sure sign of spring was the spotting of the first robin. Robins can no longer be used a sign of spring because so many now overwinter. We see them daily throughout the winter months. Are they staying because of warmer winters? No. They never left because of the cold; they left because of the lack of food. But in the past few decades, so many crabapple trees, honeysuckles, and other nonnative fleshy-fruit-producing trees and shrubs have been planted in and around the metro area that the robins now have plenty of food to get through the winter. Although they are worm eaters during the summer, robins are thrushes, and they have no problem surviving on a diet of berries. In fact,

one of the best places to see large flocks of robins in the winter around the Twin Cities is in the patches of buckthorn (*Rhamnus cathartica*), another nonnative and often reviled species, growing abundantly along the Minnesota and Mississippi Rivers. (No longer able to use the robin as the first sign of spring, Twin Cities dwellers must now rely on the arrival of the common grackle, which just don't arrive with same panache.)

Views are changing on the native–nonnative species dichotomy

Gleditsch and Carlo's (2011) article can be read as a warning to the detractors of nonnative species. In recent years, more and more scientists have recognized that many introduced species are not only not causing harm but are providing important ecological services. In some instances, the nonnative species have assumed the role of a provider of ecosystem services that were once provided by native species that have declined or disappeared from an area—for example, because of changes in climate or land use (Walther et al. 2009, Carroll 2011, Schlaepfer et al. 2011). Gleditsch and Carlo's (2011) findings indicate that efforts to eradicate some of these nonnative species could be detrimental to native species and are certainly a waste of public dollars. Many nonnative species become quickly accommodated to their new environments, during which time native species may come to depend on them. In hindsight, it looks like it may have been better for the USDA to maintain its earlier policies, which correctly appreciated some of the ecosystem services provided by the nonnative honeysuckles.

It is true that some nonnative species can cause great harm, as was described above. But so can some native species. The hantavirus, the bacteria that causes Lyme disease (*Borrelia burgdorferi*), the Colorado potato beetle (*Leptinotarsa decemlineata*), and the mountain pine beetle (*Dendroctonus ponderosae*) are all native species and serious pests in North America. Ultimately, nonnative species are just species. Like native species, a few have undesirable, sometimes dire effects; most seem to have little impact at all; and some have desirable effects. Most environments in populated areas of the world now contain both long-term residents and new arrivals, which should really be called *new residents*, since few are going back to where they came from. The mixture of new and old species in environments will only continue in the future. All this is not to say that governments should not continue to screen species coming into their countries and do their best to keep out species likely to cause severe ecological, economic, or health harm. Of course they should. At the same time, after new species have established widely in a country, a more pragmatic view needs to be taken for the majority of these species. More and more ecologists are recognizing that the native versus nonnative species perspective is losing its traction in the fields of conservation and restoration ecology. Reise and colleagues (2006) pointed out that because humans often alter both biotic and abiotic factors considerably, the terminology of *native* and *nonnative* species loses much of its intended meaning, since both the native and the nonnative species are encountering new environmental conditions and are therefore "all strangers in a strange environment" (p. 79). Making clear their opinion on this matter, Thomas and Ohlemüller (2010) said, "Distinguishing between species on the basis of how long they have been in a particular location is not sensible.… The default 'native species good—alien bad' culture that has developed in conservation and alien species control programs is no longer sustainable" (pp. 20–21). And Del Tredici came to the same conclusion in his (2010) book, *Wild Urban Plants of the Northeast*: "The plants described in this book are well adapted to the world we have created, and, as such, are neither good nor bad—they are us" (p. 20). It has become increasingly clear as we enter the second decade of the twenty-first century that the native–nonnative paradigm is losing its value, and is often an impediment, in the conservation and restoration world.

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