Wild in the Woods

The Aliens Have Landed

by Carol A. Heiser
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Something foreign is creeping about slowly underfoot, quietly overtaking our green spaces and waterways, blanketing the landscape with a seemingly innocent mosaic of textures, shapes and colors. A giant amoeba? An invisible force field? No, it's an insidious legion of alien plants. Following close on the heels of these leafy invaders is a contingency of exotic animals, too, which compete with native species and crowd them out of essential places to feed and raise their young. Together, exotic plants and animals represent a formidable threat to ecological stability and biodiversity.

Culprits We Invited

How do the exotics get here? We introduce them ourselves—sometimes unwittingly, sometimes deliberately. As Pogo once said, "We have met the enemy, and he is us." The earliest examples of deliberate introductions began in Colonial times. Colonists were homesick for the familiar chirps of their beloved weaver finches in Europe, and they introduced the birds here in North America. Today one can scarcely avoid tripping over these pocket-sized masked bandits called 'house sparrows,' which compete for nest sites with native cavity-nesting birds. In a similar fashion arrived the rock dove (pigeon) and starling.

For more than 200 years, European plants were introduced for medicinal, culinary and other household needs, and most of the weeds that invade our yards and the countryside today are the result of this legacy. For instance, our forebears used dried flower heads of common teasel to "tease" and clean the nap of cloth; chickweed to feed the chickens; English ivy to grace brick walls; gill-over-the-ground (or ground ivy) leaves to flavor beer; and garlic mustard to garnish salads. Today, garlic mustard wins the honor of being one of the worst invasive exotics in our area, because it can dominate the native ground cover and virtually take over forests.

Entrepreneurs who were eager to manufacture silk naively brought gypsy moths, which evolved in Europe and Asia, to the Boston area in 1868. Some of these escaped later into the environment because of a laboratory fire. The insects subsequently spread all over the northeastern U.S. and portions of the Southeast and

Midwest, gradually munching and defoliating their way through whole forests of about 500 different host plants. Its range continues to spread.

Horticulturists seeking to beautify our yards and parks combed Asia and the tropics for unusual plant specimens to raise in our nurseries and arboreta. Hence the arrival during the 1800s and early 1900s of such beautiful but invasive ornamentals as Japanese honeysuckle, mimosa tree, Chinese wisteria, multiflora rose, golden bamboo, nandina, Oriental bittersweet, paulownia (princess tree), ligustrum (privet), bush honeysuckles and periwinkle. At the 1876 Centennial Exposition, kudzu was also brought in as an ornamental plant. During the 1920s it was promoted as a forage for livestock, and during the 1940s the Soil Conservation Service promoted it for erosion control. Today the plant has spread throughout the Southeast, and in some areas it has blanketed whole forests.

Meanwhile, agriculturists looked long and hard for aggressive, easy to grow plants that might inexpensively feed livestock: hello Johnsongrass. This plant was brought in from Turkey in 1830 and is still being used today in parts of the south in pastures and bales of nutritious hay. Too bad the grass is able to grow new plants from every little bit and piece that might attach to a tractor and get transported to another field.

Foresters and biologists recommended a prolific berry-producing plant (actually gave the stuff away) to landowners for food patches and erosion control: autumn olive. Road crews are still using crown vetch for stabilization of road banks. The irony is that we seem to learn very slowly from our mistakes and are still doing the same things: witness the currently popular butterfly bush, which is beginning to show troubling evidence of becoming invasive.

Unnoticed Stowaways

Not all non-native introductions were planned, however. Many of the invasive species we deal with today arrived here accidentally, as stowaways or hitchhikers on ships and planes. A classic example is the zebra mussel. Merchants ferrying goods across the oceans in great ships must take on ballast water for seafaring. Once they arrive in our country, the ships dump this ballast water to reduce their weight. It is believed that sometime during the 1980s a ship released ballast water from Asia into the Great Lakes and inadvertently released thousands of zebra mussel larvae into the U.S. freshwater system. Zebra mussels have since spread to 18 states and parts of Canada; there is a colony of these mussels in a quarry in Northern Virginia, thought to have been brought in on a diver's gear.

At first glance the zebra mussel might appear to convey a benefit, because its habit of filter-feeding greatly clears up water. However, the mussel is so efficient at this task that it removes the lion's share of plankton—the base of the aquatic food web—which in turn has detrimental consequences for native fish and other aquatic life. Zebra mussels are also inexhaustible colonizers; their ability to multiply and clog water intake pipes has caused tremendous problems for water treatment plants and power generating stations.

Above: The round goby is an invasive fish that has found its way into the United States from Europe. It is aggressive, rapidly reproducing, and takes over the habitat of other native fish species, such as the logperch and sculpin.

Some of the insect species that have become today's worst nuisances arrived in this country on pallets destined for garden centers and other venues. One of these insects, which managed to survive and become established, is the Asian longhorned beetle. Native to China and Korea, the beetle entered the New York area from wood-packing material in 1996. It has become a formidable pest of hardwood trees like maple, willow, elm, poplar and sycamore in New York and Illinois. So far the insect has not spread substantially, and foresters are keeping a watchful eye on it.

Why it Matters

Non-native species tend to have an advantage over native ones when the exotics are introduced to a new area where they did not evolve. In its original native setting, any given plant or

The African clawed frog (opposite page), hydrilla (left) Japanese honeysuckle (right) and phragmites (far right) are just a few of the many alien and invasive species that now make Virginia their home.

Nutria (below) is a large rodent that can grow as large as a medium size dog. It was introduced to this country from South America for its fur. Since arriving they have posed a serious problem by destroying wetlands and competing for habitat that other animals rely on, such as the native muskrat (top).

animal has had to cope with associated predators, diseases, climatic conditions, available food resources, and a host of other environmental factors that effectively limit its population size over time. Nature keeps things in relative equilibrium through this complex system of checks and balances. However, when a plant, seed or animal is uprooted from its natural habitat and subsequently transported to completely dissimilar environs 2000 miles away (whether by accident or by design), one of two things can happen: the foreigner will either go belly-up because the new habitat is too different to survive in, or it will proliferate because the new conditions happen to be better than the ones it originally came from.

Exotic plant and animal species which are able to invade and colonize an area are successful for a variety of reasons. Oftentimes the invasive species does not have to deal with the usual diseases or predators that would ordinarily be found in its home habitat. In other instances, the species may have characteristic behaviors or adaptations that enable it to be more aggressive or competitive with native ones. For example, honeybees were first introduced to this continent in Jamestown almost 400 years ago, and since that time they have spread from coast to coast. These bees have certainly benefited our crop and fruit production and provided us with tons of delectable honey. But the sweetness comes with a cost: it has been documented that honeybees dominate the pollination community, which is made up of other bee species as well as ants and wasps. "The honeybee does so by virtue of its superior ability to detect, to direct its peers toward rewards (via dance language), and to rapidly harvest floral resources" [*The Forgotten Pollinators*, by Buchman and Nabhan, c. 1996].

Sometimes a new species exhibits more prolific reproduction or more rapid growth than the natives. A good candidate to explain this phenomenon is purple loosestrife, an aquatic plant native to Europe and Asia that was introduced to the U.S. in the early 1800s, primarily as an ornamental water garden plant. Although its purple flowers are very attractive, this is an extremely aggressive species that can take over a whole lake or wetland through exponential growth, crowding out all other aquatic vegetation. It blooms all summer and releases seeds almost continuously; one flower stalk may produce 300,000 seeds, and an entire plant can produce over two million. As if that weren't bad enough, loosestrife can also spread through pieces of stems or from its roots; one plant may grow 30 to 50 root shoots.

In still other cases, an exotic species may happen to be bigger than its close relatives in the new environment it's introduced to. The exotic, could therefore, have a competitive edge in securing food resources or muscling its way into better breeding sites. Like the bionic man of TV fame, invasive exotics tend to be "bigger, stronger and faster."

Insatiable Nutria

A case-in-point is the nutria. Nutria are huge rodents which can grow to 2 feet in length and up to 25 pounds in weight. They were widely introduced to the United States during the 1940s for the fur trade and have gradually spread north- and westward from the Gulf states into the entire southeastern region of the country. Native to Bolivia, Argentina, southern Brazil and Chile, this aquatic mammal inhabits brackish and freshwater marsh habitats and consumes the leaves and roots of green plants such as duckweed, cattail and various grasses. In the process, it competes for habitat resources with our smaller, native muskrat. Nutria present a grim problem for wetlands surrounding the Chesapeake Bay, because these animals have a propensity for ripping out large areas of vegetation. The effects of their destruction are cumulative and include fragmented marshland, barren mud flats called "eat outs," and deep swimming channels. Back home in South America, nutria populations are kept in check by alligators. Here in Virginia. . .oh dear, we don't have any alligators! Hence another exotic species without natural controls. Currently, land managers on National Wildlife Refuges and other public properties are making an effort to trap and eradicate the species, before it causes significant reductions to the habitats that muskrat, waterfowl and other wildlife species depend on.

When is a Snake Not a Snake?

The most recent nasty to arrive on the environmental scene is the northern snakehead. It's not a snake but a fish that's native to China. In Asia, snakeheads are used as a food fish and for curing ailments. Able to survive in a variety of habitats, snakeheads are most comfortable in shallow, vegetated waterways; they can not tolerate saltwater. These fish are top-level predators that will eat other fish and aquatic animals. They are also highly adaptable to harsh environmental conditions and even have an air bladder to breathe air. Somehow snakeheads have found their way into U.S. waters in eight states, possibly from aquarium releases. Here in Virginia, several individual fish have been caught in the Potomac River, including a female carrying eggs. Unfortunately, snakeheads have no natural predators in the U.S. The concern is that if this species is able to establish a functional population, then it might outcompete (or out-EAT) other fish in the food web and thereby disrupt aquatic ecosystems.

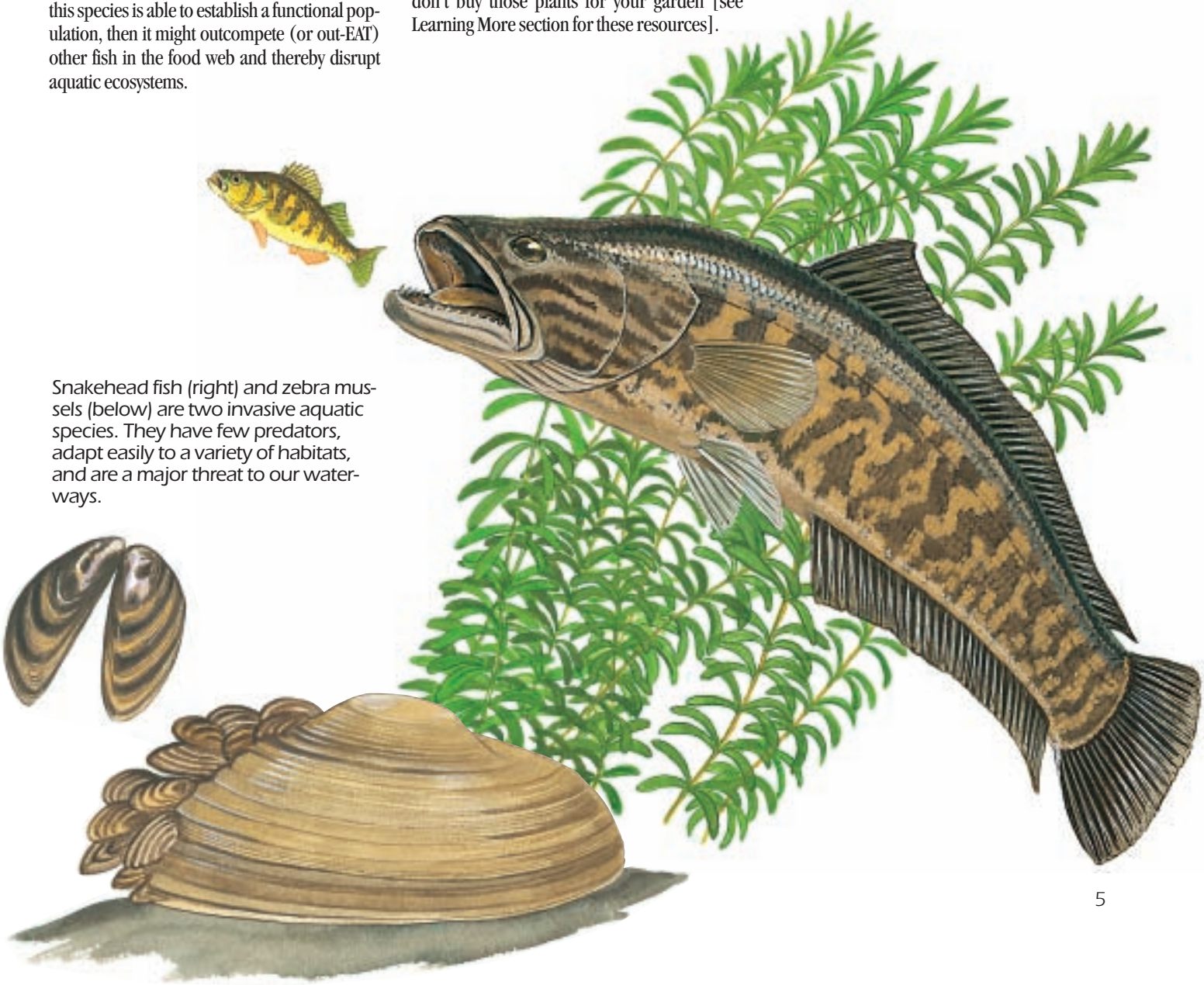
Buyer Beware

When we talk about "native" species, we need to ask ourselves, "native to where"? Take a close look at a can of "native" wildflower meadow seeds on the shelf of your favorite home and garden store. Most of the seeds in the can are more likely to be native to a Midwestern prairie or maybe New England, not Virginia. Perhaps the seed company meant to say "native to North America."

This is not to imply that a wildflower species native to the prairies will necessarily become invasive if planted in Virginia. The point is "buyer beware." Do not assume that all of the plants for sale at your local mammoth-mart or favorite nursery will be harmless in the environment; the majority of plant material sold by the horticulture industry in Virginia is non-native to our area. Be an informed consumer instead: arm yourself with a list of proven invasive exotics and don't buy those plants for your garden [see Learning More section for these resources].

Just because you can order something from a catalog doesn't necessarily mean it must be O.K. to ship to Virginia, either. Ditto for animals you can buy in a pet store. The marine toad may be a popular item to use in science projects, and the African clawed frog might be considered a unique pet, but both of these species are illegal to own in Virginia. Nationally known science supply catalogs routinely sell live frog eggs advertised as "field collected." Collected from where? Missouri? Japan? Do those frogs belong here? A conscientious biologist would shout an emphatic "no!"

These movements of plants and animals across state and national boundaries are creating an ecological powder keg. The problem of non-native invasions is happening worldwide, particularly as an outcome of accelerated globalization and the fast-paced movement of people and goods from one continent to another.



Snakehead fish (right) and zebra mussels (below) are two invasive aquatic species. They have few predators, adapt easily to a variety of habitats, and are a major threat to our waterways.

Keep Captive Animals Captive

"What's all this got to do with me?" one might be asking, "it's not my fault if ships keep dumping their ballast water into the Great Lakes; and I can't help it if the Colonists brought in a lot of weeds, that's history." This might be true; but what about all those half-used buckets of bait that get dumped in the river at the end of countless Saturday fishing trips? "Oh, that's just a few crawdads, that won't hurt anything." What if the seemingly innocuous crawdads are exotic species raised in Georgia or Louisiana that carry a virus which the Virginia species haven't been exposed to? And are we expert enough to correctly identify all 32 species of Virginia crayfish anyway, to know the difference?

When in doubt, DON'T throw it out! When the aquarium stops working and you decide not to keep those flashy iridescent fish that may have originated in the South Pacific, give them to a pet shop or a friend, or euthanize them and give them a proper burial—do anything but dispose of them into a creek, pond, or other body of water. Do not buy mussels or snails or tadpoles to put in your backyard water garden (native critters will colonize the water for you). When your children outgrow the cool lizard they found at Grandma's house, seek out a school or nature center to house it. Avoid ordering butterflies from catalogs to release at weddings. If a friend gives you a cat and you change your mind about it, take it to the animal shelter, don't release it into the woods. Each of these scenarios may be perceived as 'isolated' events ("I'm only going to do it once"), but it's the cumulative effect of everyone's actions that can potentially cause detrimental ripple effects throughout the ecosystem. The stakes to the environment are simply too high.

Let this be our mantra, repeated over and over again to friends, neighbors and family: absolutely never release aquatic or terrestrial animals from captivity into the environment. Any live animal that you buy or legally collect live must remain in captivity for the rest of its life. Besides the possible negative impact to native species or the environment, there's one other good reason: releasing animals from captivity into the wild is illegal in Virginia, unless otherwise specifically permitted by law or regulation.

The rudd, native to Eurasia, was introduced to this country in the 19th century. It is now prolific in many states and threatens native fish species.

Learning More....

National Invasive Species Council, www.invasivespecies.gov/council/main.shtml—an interdepartmental council of federal agencies that provides excellent, comprehensive information about invasive species, including the most recent issues and alerts; lesson plans and other educational resources for teachers; fact sheets on animals and plants; databases; and state invasive species laws.

Plant Conservation Alliance, www.nps.gov/plants/alien/—*Weeds Gone Wild: Alien Plant Invaders of Natural Areas*, a web-based project of the Plant Conservation Alliance's Alien Plant Working Group; provides a national list and fact sheets of invasive plants.

Division of Natural Heritage, *www.dcr.state.va.us/dnb/*—the mission of the Va. Dept. of Conservation's Natural Heritage program is to conserve Virginia's biodiversity through inventory, protection and stewardship; provides a listing of invasive plants and numerous fact sheets.

Cats Indoors!, www.audubon.org/bird/cat –American Bird Conservancy's citizen action campaign which educates the public about the havoc wreaked on bird communities by free-roaming (stray) cats. ☐

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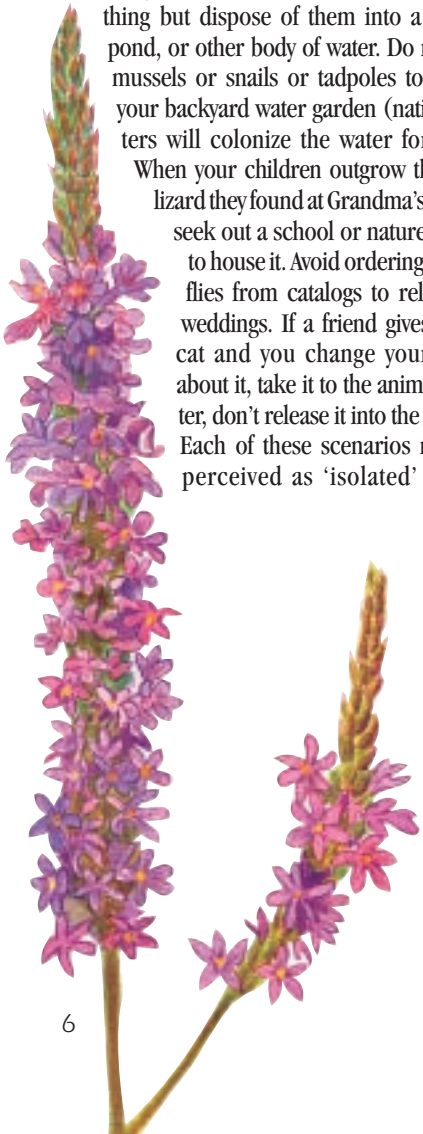

Purple loosestrife (left) and kudzu (right) were both introduced to the United States with good intentions, but because of their ability to quickly reproduce and choke out native plant species they are now a serious problem.