

Invasive Species



INVASIVE SPECIES

What is an invasive species?

An invasive species is non-native to the ecosystem in consideration and causes or is likely to cause economic or environmental harm or harm to human health.

Sometimes you will see invasive species referred to as exotic, alien, or non-indigenous species. The problem with these names is that they only refer to the non-native part of the definition above. Many exotic or alien species do not cause harm to our economy, our environment, or our health. In fact, the vast majority of “introduced” species do not survive and only about 15% of those that do go on to become “invasive” or harmful.

An invasive species grows/reproduces and spreads rapidly, establishes over large areas, and persists. Species that become invasive succeed due to favorable environmental conditions and lack of natural predators, competitors and diseases that normally regulate their populations.

Plants and animals have always moved around

Plants and animals have been moving from one place to another for many millennia. These movements have been relatively slow, allowing for life forms to adapt to changes in habitat and species interactions. Humans have always been agents of dispersal for plants and animals either accidentally or intentionally. However, as humans began exploring the planet on a larger scale, rates of introductions of species to new areas accelerated. Now with our global economy and advanced technologies, these rates have reached a level never before seen in ecological history.

How did invasive species reach the Southwest?

For more than 2,000 years, Native Americans moved plants and animals all over the Southwest. Starting in the 1500's, the number of new exotic species as well as the speed at which they moved increased. The Spanish brought exotic agricultural crops and domestic animals from other parts of the world to the Southwest during the Spanish conquest. The new species introduced to the Southwest between 1500 and 1900 were accompanied by changes in physical conditions in the landscape that accelerated the naturalization of these exotics. At the same time, native species were declining. Dams and grazing significantly contributed to the spread of exotic species. The arrival of the railroad resulted in another increase in invasive species. With the development of roads, airlines, and global commerce, species can now travel from one corner of the world to the Southwest in a matter of hours.

What is an introduction?

When a species ends up in a new ecosystem, it is considered “introduced.” Species do naturally change their ranges slowly over time, but it is not these “natural” events that we are concerned with. Most of the introductions that result in invasive species are human caused.

In some cases, we deliberately introduce species. Examples of this include garden ornamentals, range forage plants for cattle, animals and insects used to control other organisms (particularly in agriculture), and plants used for erosion control and habitat enhancement for wildlife.

Other species are introduced accidentally on imported nursery stock, fruits, and vegetables, in ship ballast waters, on vehicles, in packing materials and shipping containers, through human-built canals, and through human travel.

How does a species become invasive?

It is not enough for a species to be able to exist in its new environment, although a close match between environmental conditions in the species' home environment and the environment to which it is introduced is fundamental to its survival there. Beyond this, the organism must be able to establish a viable and growing population. To do so, the new species must be capable of outcompeting and/or displacing native organisms. Lack of natural controls in the new environment is also a factor in the establishment of invasive species. Without the diseases, parasites, and predators that regulated the invader's population in its homeland, it can spread rapidly.

Native species may also lack adaptations that allow them to resist competition from or predation by invasive species. If the invasion (particularly with plant species) is coupled with other disturbances to the new ecosystem (e.g., earth moving, plowing, fire, livestock grazing, changes to surface and groundwater hydrology), native populations may be weakened from the start and the ecosystem rendered more susceptible to an invasion..

Why do we care?

Invasive species are a form of biological pollution. Invasive species decrease biodiversity by threatening the survival of native plants and animals. They interfere with ecosystem function by changing important processes like fire, nutrient flow, and flooding. Invasive species hybridize with native species resulting in negative genetic impacts. As renowned biologist E. O. Wilson states, "On a global basis...the two great destroyers of biodiversity are, first, habitat destruction and second, invasion by exotic species."

Invasive species also have economic consequences and can endanger human health. Invasive species contaminate agricultural seed crops and reduce their value, pose health threats to livestock, and necessitate costly repairs to harvesting machinery. Invasive insects can harm crop plants and reduce their productivity, contaminate harvest surpluses, and act as vectors of disease among livestock or in human populations. Invasive species can also destroy electrical equipment, homes, and buildings. Control of these organisms chemically, biologically, and mechanically exacts great expenditures of time and money in addition to the losses mentioned above. In the United States alone, these expenses may total many tens of billion (the latest National Geographic article on Invaders estimates the cost at \$140 billion) dollars annually.

WHAT CAN YOU DO TO STOP THE SPREAD OF INVASIVE SPECIES?

VOLUNTEER

You have already taken the first step to do all you can to stop the spread. Becoming a volunteer in the INVADERS of the Sonoran Desert Region program is a great way to help invasive plant managers and eradication groups to successfully prevent and control invasions. You are also preparing yourself to be an educator of others in our community and beyond.

You may also want to join an eradication program in our area. Links to some of these programs will be available on the ASDM INVADERS web page at www.desertmuseum.org/invaders.

EDUCATE YOURSELF AND OTHERS

You will learn the basics of invasive species threats and issues during your citizen scientist training. There are many other sources of information available to you both in this handbook and on the ASDM INVADERS website. Take this opportunity to expand your knowledge and share it with your family, friends, and others in the community. If you come upon information sources that you think would benefit other volunteers, please let us know so we can share that information. We are relying on you as a citizen scientist to not only collect scientific data, but to actively participate in our invasive species community awareness campaign.

DO NOT BE A VEHICLE OF DISPERSION

Most invasive species are introduced by humans accidentally. Learn how to prevent carrying invasive species on your boats, cars, bicycles, motorcycles, and socks and hiking boots. You can visit the following websites for more information on how to prevent the spread of invasives.

- Union of Concerned Scientists tips for preventing species invasions (We have included this information in the following pages as well):
http://www.ucsusa.org/global_environment/invasive_species/page.cfm?pageID=390
- Habitattitude – an initiative to prevent the release of unwanted fish and aquatic plants.
www.habitattitude.net

GARDEN WISELY

Avoid plants that self seed and show up outside of your garden. Do not use weedy volunteers from parks and abandoned lots. Most non-native species are okay; the invasive species are the ones to avoid. However, planting a native species garden can be very rewarding. There are many resources to help with creating low-maintenance and colorful native plant gardens that attract birds and wildlife.