Invasive alien species cost South Africa’s economy an estimated R6.5 billion a year and are threatening up to 30% of the water supply in major cities in the Western and Eastern Cape, according to a collaborative report by the DST-NRF Centre of Excellence for Invasion Biology at Stellenbosch University and the South African National Biodiversity Institute (SANBI).

The Status of Biological Invasions and Their Management in South Africa in 2017 is an independent assessment of the status of biological invasions and their management in South Africa. It is the first country-level assessment specifically on biological invasions anywhere in the world.

Although most alien species are beneficial and don’t necessarily become invasive, others are not.

To date, 775 invasive species have been identified, most of them are terrestrial and freshwater plants (574 species) or terrestrial invertebrates (107 species). A total of 107 species were considered by experts to be having either major or severe impacts on biodiversity and/or human wellbeing – 75% of these were terrestrial or freshwater plants.

Why should we be concerned?

Reduction in water supply
Invasive trees and shrubs reduce water runoff and groundwater recharge, reducing the water supplies to already-stressed farms, towns and cities, and increases fire hazards and biodiversity erosion.

At a national scale, the combined impacts of invasive alien plants on surface water runoff have been estimated between 1 444 to 2 444 million m³ per year. If no remedial action is taken, reductions in water resources could rise to between 2 589 and 3 153 million m³ per year, about 50% higher than estimated current reductions.

Loss of livestock
Invasive plants reduce the capacity of the land (such as grassland, savanna and Karoo vegetation) to support livestock by displacing palatable indigenous plants, thereby also threatening the livelihoods of people who depend on livestock production.

Invasive alien plant infestations are estimated to have reduced the potential for South Africa to support grazing stock by approximately 115 000 large stock units – just over 1% of the potential number of livestock that could be supported. If no remedial action is taken, impacts are projected to become much larger with up to a 71% loss of grazing in some biomes.

Loss of biodiversity
Invasive plants and animals impact negatively on biodiversity and the services that South Africa’s diverse natural ecosystems provide such as fisheries, livestock production, harvesting of natural products, national and international tourism, and recreation. Unsurprisingly, this has a knock-on effect on the country’s economy and food security.

Reductions in biodiversity intactness in South Africa’s terrestrial biomes were highest (3%) in the fynbos biome. Under a scenario where invasive alien plants are allowed to reach their full potential, biodiversity intactness is predicted to decline dramatically, by around 70% for the savanna, fynbos and grassland biomes, and even more (by 87% and 96%) for the two Karoo biomes.

How do invasive species enter South Africa?

Deliberate introduction
Most alien species found in the country today were introduced intentionally. The reasons range from erosion control and biological control to hunting and landscape improvement. Almost all agriculture and forestry production is based on alien species and they are widely used in horticulture, aquaculture, mariculture, or are kept as pets.

Accidental introduction
Other alien species found their way into the country by accident and through various pathways. For example, as contaminants on imported plants/seeds or animals, or as stowaways on visiting ships and aeroplanes, or in the luggage of tourists.

There are 72 official ports of entry through which people, goods and transport vessels can enter the country.
country. The rate at which alien species are being introduced has been increasing steadily, from around 35 species per decade in the 1950s to 70 species per decade between 2000 and 2010. With trade and tourism ever increasing, accidental introductions will likely continue to grow. However, it is expected that rates of deliberate introduction will decrease in future thanks to improved legalisation.

Which invasive species are considered problematic?

Alien plants are the most diverse, widespread and damaging group of invaders in South Africa. The 107 species considered to have major or severe impacts consist of:

- 80 terrestrial or freshwater plants
- Eight mammals
- Five freshwater fish
- Five freshwater invertebrates
- Five terrestrial invertebrates
- Two amphibians
- One bird species
- One marine plant species

Here are a few examples of invasive species that can have major or severe negative impacts in South Africa:

- North American mesquite trees (Prosopis) reduce grazing potential; deplete groundwater resources; and negatively impact on biodiversity.
- Australian wattle trees (Acacia) reduce grazing potential and surface water runoff, and negatively impact on biodiversity.
- North American and European pine trees (Pinus) reduce surface water runoff; negatively impact on biodiversity, and increase the fire intensity and damage done by wildfires.
- Herbaceous and succulent species such as triflaid weed (Chromolaena odorata); famine weed (Parthenium hysterophorus); pompom weed (Campuloclinium macrocephalum), and many cactus species severely reduce rangeland productivity and thus the livelihoods of rural people.

- Feral domestic cats (Felis catus) and house mice (Mus musculus) are serious threats to breeding marine birds on offshore islands.
- North American smallmouth bass (Micropterus dolomieu) decimate indigenous and endemic fish and invertebrates in streams, rivers and dams.
- Argentine ant (Linepithema humile) disrupts ant-plant mutualisms that are responsible for the seed dispersal of indigenous plants, and thus pose serious threats to indigenous vegetation survival.

Measures of control

Monitoring and control of invasive species are an ongoing process. The good news is that South Africa has achieved major successes in the field of biological control of invasive alien plants, and is regarded as a world leader due to the development and promulgation of comprehensive regulations to manage biological invasions. Currently, 15 species are under complete control and a further 19 species under a substantial degree of control.

A system of risk assessment and permitting to regulate the importation of new alien species has been in place since 2014. However, only one of South Africa’s 72 international entry points is consistently monitored to intercept new potential environmental pests carried by air passengers and in cargo, although additional measures are in place through the Department of Agriculture, Forestry and Fisheries to limit the arrival of new agricultural pests.

There have also been nine historical attempts at eradicating species in South Africa, and three have succeeded – the eradication of domestic cats (Felis catus) from Marion Island; the Mediterranean snail (Otala punctata) from the Western Cape, and the khapra beetle (Trogoderma granarium) at multiple sites. More species, such as house crows (Corvus splendens), have been actively targeted for eradication in Cape Town and Durban, and more successes are expected over the coming decade.