Phytophthora Dieback Atlas

From the bush to your back fence: **What you need to know**

GOVERNMENT OF WESTERN AUSTRALIA

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Acknowledgments

The Phytophthora Dieback Atlas was prepared for the State Government's Dieback Response Group by the Department of Environment and Conservation, the community-based Dieback Working Group and industry.

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Front cover: Jarrah forest affected by dieback. Photo – Marie Lochman/DEC
Back cover: Dieback-affected plant species.
All Photos – DEC unless otherwise indicated.

Minister's foreword

Phytophthora dieback is a pathogen killing our forests, woodlands and heathlands.

This Phytophthora Dieback Atlas is currently the most accurate assessment of its extent in Western Australia's South West Botanical Province.

Dieback was first observed in the State in 1921 but was not identified until 1964 when the cause – a microscopic water mould called *Phytophthora cinnamomi* – was discovered. It has now infested hundreds of thousands of hectares of remnant native vegetation between Eneabba and Cape Arid, east of Esperance.

Recent studies show that almost half of WA's 383 threatened plant species and about 2300 of the 5700 described plant species are susceptible to the disease.

To combat the spread and subsequent biological decline caused by *Phytophthora* dieback, the State Government established the Dieback Response Group in March 2004. Its role was to implement dieback response actions and create partnerships with the community and industry.

The Dieback Response Group produced this atlas assisted by more than 100 dieback, vegetation and data management specialists from the Department of Environment and Conservation.

Atlas maps include survey data collected on behalf of other State Government departments and by companies such as Alcoa World Alumina Australia, the Dieback Working Group and the South Coast Regional Initiative Planning Team.

Financial support for the mapping was provided by the Australian Government's Natural Heritage Trust and Alcoa World Alumina Australia. For the first time, the known extent of dieback in the metropolitan area, the Swan Coastal Plain and the heathland communities of the south-west and Great Southern have been clearly documented.

The atlas will be an invaluable tool allowing the public, landholders, industries and State Government agencies to use its information to protect dieback-free areas and minimise its spread. Work is also being carried out to protect the biodiversity of special areas at risk.

Preventing the spread of dieback will present major challenges but with cooperation, I am confident we will succeed.

Mark McGowan MLA
Minister for the Environment

Phytophthora Dieback . . .

Dieback-affected hakea plants on the south coast.

- is a pathogen that travels from plant to plant via a microscopic water mould in soil, water or through root-to-root contact. *Phytophthora* is a Greek word meaning **plant destroyer**;
- kills plants by destroying root systems and starving plants of food and water;
- doesn't just kill jarrah. It kills common native plants such as banksias and grass trees, and many horticultural crops and common garden plants;
- threatens half WA's rare flora species;
- threatens almost 40 per cent of the South West Botanical Province's flora – that's 2300 species;
- can cause a mass collapse of animal and plant ecosystems. Infestations in bushland lead to a dramatic drop in plant diversity and structure;
- is readily transported from site to site by the movement of infested soil, water or plant material;
- can be easily transported to your back garden through the movement of infested soil or infected nursery stock;
- can be easily spread on car, bike and four-wheel-drive wheels, and your shoes;
- is widespread across the banksia woodlands and jarrah forest in the Perth metropolitan area;
- sends spores into the soil which prevent the regeneration of many native plants; and
- causes the highest devastation in areas with more than 800mm of rain a year.

One of the species most susceptible to dieback is Banksi Brownii, *on the south coast, which has only 10 remaining populations. Three populations have been translocated.*

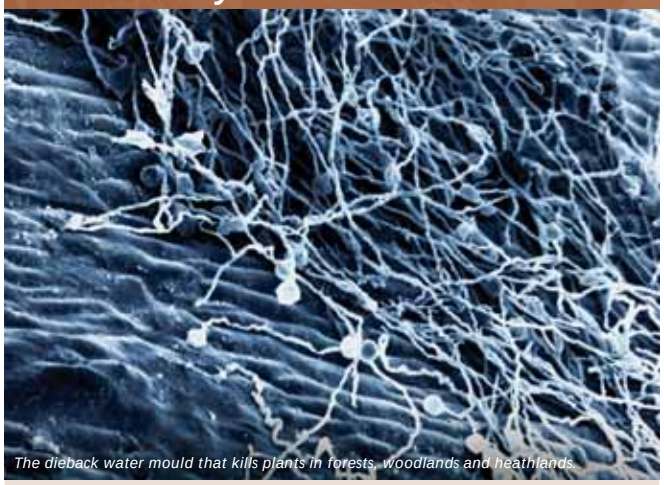
Contents

The contrast between dieback-affected land where tree saplings do not regrow (foreground) and healthy native vegetation. Photo – Jiri Lochman/DEC

The threatened plant Dryandra montana *from the Stirling Range on the south coast has been translocated to a private property, also on the south coast.*

The advance of dieback… depauperate sedgeland in the front contrasts with rich shrubland in the back.

Summary



The dieback water mould that kills plants in forests, woodlands and heathlands.

Phytophthora dieback is caused by a slow-moving water mould that kills plant species in forests, woodlands and heathlands between Eneabba and Cape Arid, east of Esperance.

Its arrival has had catastrophic consequences for the biota of a number of ecosystems. It causes a decline in biodiversity, irreversibly damages plant communities and affects the habitats and food supplies of native animals that live in them.

Once established in an area it can never be eradicated.

Few people realise that dieback has already wiped out many wildflowers and caused a biological disaster in the Stirling Range National Park where many native animals that depend on the vegetation are threatened with extinction. Many plants are also on the brink of extinction.

Dieback can cause:

- loss of biodiversity,
- extinctions of threatened plant and animal species,
- reduced richness of native plant diversity,
- loss of key understorey species,
- disruption to woodland vegetation structure,
- loss of habitat and food sources for birds, small mammals and insects, and
- the increased dominance of resistant plants such as grasses, rushes and sedges.

Dieback affects industries such as honey, horticulture, timber and tourism. Losses to the economy occur through the impacts on mining, forestry, tourism, horticulture and biodiversity.

Dieback is prevalent in areas that get more than 800mm of rain a year. In areas where rainfall is between 400 and 800mm, it tends to be confined to lakes, wetlands, stream systems and road verges.

It is present in temperate climates throughout Australia and throughout the world. However, WA suffers the greatest impact from this pathogen because it was introduced to favourable environments with large numbers of susceptible plant species.

If you're a bushwalker, trail bike rider, horse rider, cyclist, tourist, commercial vehicle operator or four-wheel-drive enthusiast who likes to go into bushland, you need to take some precautions.

You can easily transport dieback from bushland to your back garden so clean your tyres and your shoes when you leave infected areas, and don't bring soil and rocks back home from the bush.

How can you help?

Imagine a future where our bushland, regional parks and national parks across the south-west are dying.

Instead of being shaded by tall, leafy trees and walking in flourishing ground covers we trek through open spaces. Many plants have perished after being infested with dieback and a large number of native plant populations have disappeared. Included among these are populations of many rare and threatened species. The insidious disease has caused ecosystems to fail, affecting plant and animal populations as habitats disappear and food supplies become short.

It's a situation that's already happening.

How does it spread?

It is mostly spread by humans whose cars, bikes, four-wheel drives, heavy machinery, trucks and shoes carry infested soil from dieback-infested areas into clean areas. It's also spread when dirty tools are used and through contaminated nursery stock.

It travels on mud, soil, gravel and in infected plants.

Dieback now threatens 2300 of the 5700 flora species in the South West Botanical Province.

Hundreds of thousands of hectares of native vegetation have been infected. Forests, national parks, nature reserves, remnant vegetation, bushland, conservation parks, farmland and private properties are all at risk.

More than 65 per cent of the Stirling Range National Park near Albany is affected. In the South Coast region 800,000 ha have been remotely surveyed for dieback. More than half – 465,000 ha – appears to be infested.

Forest affected by dieback. Photo – Marie Lochman/DEC

The before and after effects of dieback.

How do we stop it?

Preventing dieback is everyone's responsibility. We can all do something to help reduce the spread of this devastating plant disease.

A total of 720,000 ha of land in the south-west was intensively mapped for dieback. Of this 170,000 ha were found to be affected. Many of these areas were mapped some years ago, and the disease will have spread since then.

This intensive mapping is used to plan hygiene management for the area concerned, to limit spread in the presence of activities that would otherwise have some risk of spreading the disease.

Extensive mapping for strategic planning has also been carried out in the south-west and the South Coast, but is not suitable for designing hygiene management actions.

Areas which are still free of the disease are special and everyone should cooperate to protect them. It's important to protect dieback-free areas from the disease.

Some dieback-infested areas are signposted, so you will know when you are entering or leaving one. However, most infested areas outside the jarrah forest aren't signed so use the precautionary principle of cleaning your vehicles and shoes.

Remember to be on the lookout for forest quarantine or disease risk area signs.

Clean your wheels and shoes

Because dieback is a water mould that lives on plants and soil, it spreads when you move from an infested area because the soil attaches to your car wheels, your horse's hooves, your truck wheels, your four-wheel-drive wheels, your bike tyres and your shoes or when you take plants, rocks or soil home. It's particularly bad in wet weather when mud adheres to shoes and vehicles.

The best solution is to wash your car when you leave a dieback-infested area.

To keep our bushland safe, bushwalkers, tourists, commercial vehicle drivers and locals who travel in and out of dieback-infested areas must wash their cars, especially the wheels, and their shoes when they leave.

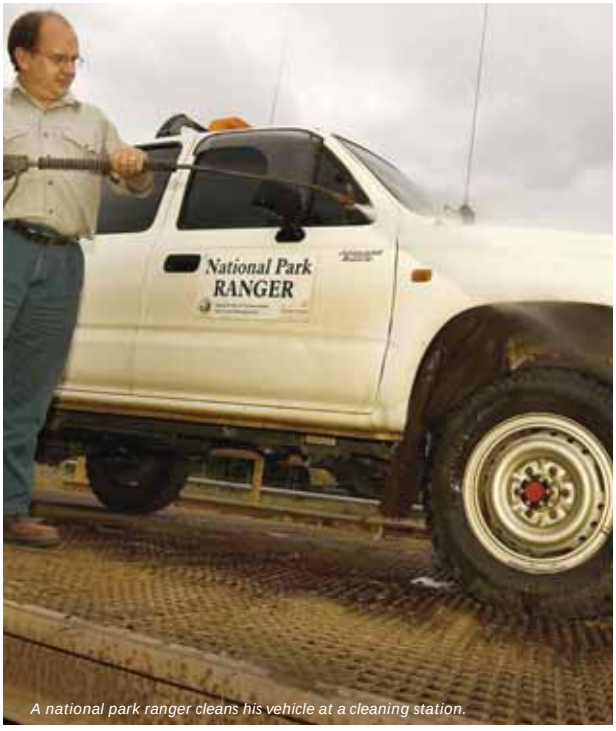
Other ways

It's best if you leave rocks and soil down south. Bringing them back home could introduce dieback to your back garden. It's an even bigger risk to take plants from bushland or plant infested seedlings. In three years your backyard vegetation could be dead because dieback can kill many common garden plants including roses, azaleas and fruit trees.

In small areas that are dieback-free, plants can be made more resistant to dieback by being treated with a chemical called phosphite which is not toxic to plants or animals. Phosphite can be applied to flora and vegetation by spraying or injection. This is done in areas that are at risk of infestation or to prevent the spread of an infestation.

In the future

Regional natural resource management groups and the Department of Environment and Conservation are working steadily to control the spread of dieback.



A national park ranger cleans his vehicle at a cleaning station.


The threatened Dryandra montanana growing after being translocated to a dieback-free location.


Fitzgerald National Park.


A dieback Working Group project officer demonstrates the phosphate injection technique at Alinjarra Primary School in Alexander Heights. Teachers, parents and students from the school participated in the dieback treatment effort. Photo – Angie Michael

What's happening in our regions?

Perth metropolitan area

Dieback has been mapped in 50 reserves in the metropolitan area. Most are vested in local authorities. Of the sites mapped by the Dieback Working Group, 70 per cent are infested with the disease. However, it's important to note that in the reserves where dieback is present, most bushland does not show any physical sign of dieback and can be protected by good management practices. Community volunteers work in areas infested by dieback, treating the infestation by spraying or injecting plants with the protective chemical, phosphite.

Northern agricultural region

Although once thought to be too dry for *Phytophthora* dieback, severe infestations have been recorded in Dandaragan National Park and adjacent areas. Areas as far north as Mt Lesueur National Park, which has rare flora species, would be adversely affected if *Phytophthora* dieback was introduced.

Avon-Swan region

Dieback has had a severe impact in many types of native vegetation in this area. Many are being treated with the protective chemical, phosphite. However, many areas are uninfested and are now being protected by closely monitoring activities that can spread the water mould. These include road building, road maintenance and earth works associated with mining and infrastructure development.

South-west region

Phytophthora dieback has severely affected coastal heathlands, banksia woodlands and forests along the Darling scarp and beyond. The dominant tree species for these forests is *Eucalyptus marginata*, or jarrah, where the effects of *Phytophthora* dieback were first recorded.

The Department of Environment and Conservation (DEC) began an aerial photography and disease mapping of substantial areas of the south-west forests in 1976. Many areas remain uninfested. Activities to protect them from humans inadvertently transporting the water mould during road building, road maintenance, timber harvesting and earthworks associated with mining and infrastructure development are continuing.

South coast region

Dieback extends from Walpole to Cape Arid National Park east of Esperance. In some cases the disease has devastated some of our major national parks.

Many uninfested areas remain. The region has 1,800,000 ha of remnant vegetation, 800,000 ha of which have been mapped for dieback. Of this, 465,000 ha are infested leaving 325,000 ha disease free.

Figure 1) Level of dieback in Perth

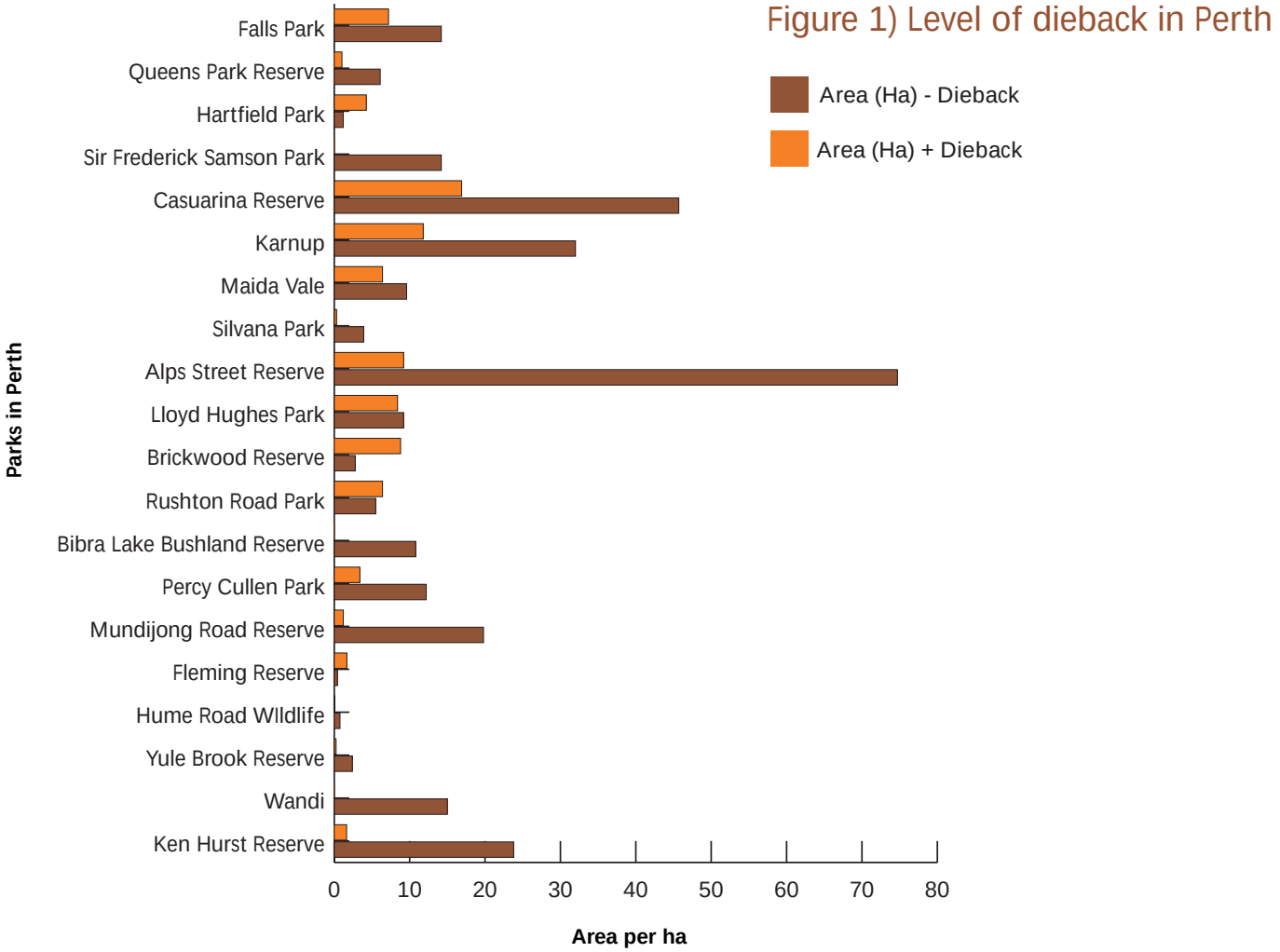


Figure 2) Susceptibility of flora to *Phytophthora*

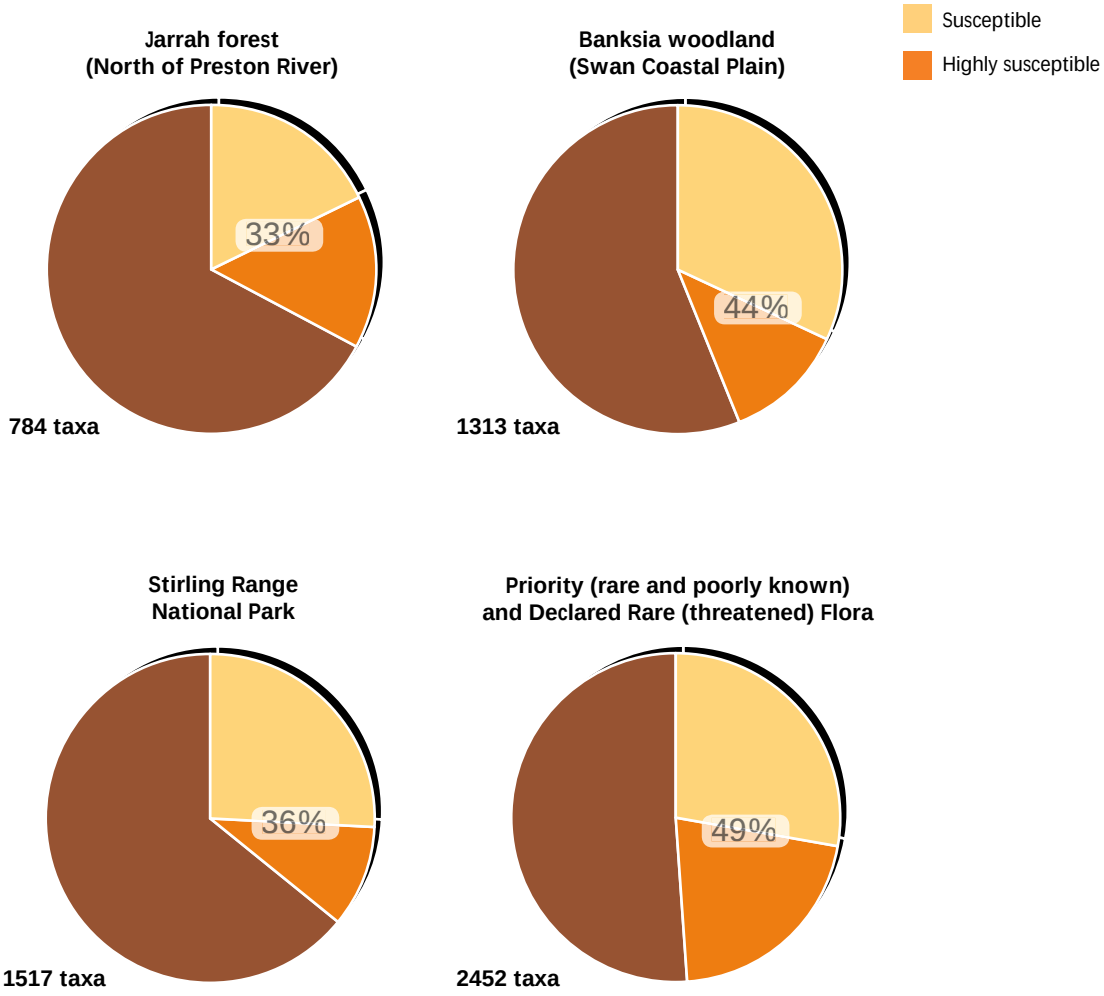
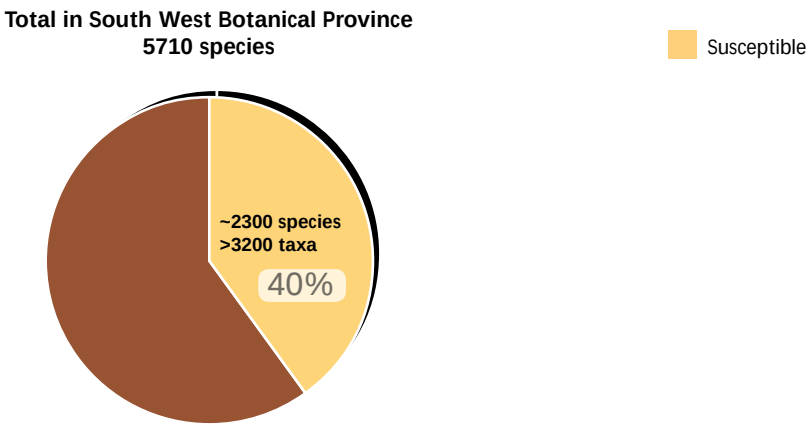


Figure 3) Susceptibility of flora in the South West Botanical Province



Contacts

For more information visit

www.dieback.org.au

http://www.dwg.org.au

http://www.dieback.net.au

For more local information contact your district's Department of Environment and Conservation office.

For more general information contact the Dieback Response Group's Executive Officer, Kevin Vear, on 9474 7044, 0419 904 997 or kevin.vear@dec.wa.gov.au or the SCRIPT team at www.script.asn.au.

Bansia coccinea at Gull Rock, another species highly susceptible to dieback.

Dieback afftected Gull Rock on the south coast.

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