



7 Seed Collection and Propagation

7.1 What Seeds to Collect?

7.1.1 Seed collection – A landholder guide to what, when & how

Endemic native plants that produce seeds give you the opportunity to reproduce your own strong plants that have evolved to cope with local conditions. Planting out young plants on your property that have been grown from local seed gives your plants a better chance for survival than using immature plants struck from cuttings. This is because the root system is better developed. They are also generally hardened off to local conditions and therefore need a lot less ongoing maintenance.

Collecting indigenous seed also helps to maintain genetic integrity within a species. Local varieties adapted to our conditions are called "provenances". By mixing species from other areas we can unknowingly create hybrid plants that may not necessarily cope with our range of conditions. It is also important to keep in mind that even native species can become garden escapees and thus environmental weeds when grown outside their natural range and habitat, further highlighting the importance of using indigenous stock.

You can collect seed from native species within your land or alternatively, choose to collect local tubestock used for the Berry Bush Links Project from local nurseries and businesses including the Berry Public School nursery, that has a Plant Propagation Program. For more information please call *Berry Public School* on 4464 3911 or refer to the 'Berry Area Nursery Contacts' page. In addition, Berry Landcare has a wide range of knowledge on seed collection and propagation. For further information on how they can offer assistance with these projects on your land, please call **4464 3241**.

Keep in mind, that there are regulations you must abide by if the plant you wish to collect from is a threatened or endangered species. Check with the Threatened Species Officer at Shoalhaven City Council on **4429 3111**, for more information. A list of threatened flora and fauna of the Shoalhaven is included in this guidebook.

7.1.2 Choosing the collection site

The site that you collect seed from should be as close to the site you wish to revegetate as possible. That does not mean it has to be within a certain distance, but rather have similar soil, altitude and aspect. For example, seeds collected from plants in sheltered gullies will probably not be successful mature plants on windswept salt affected foreshores.

Note that collection of material in National Parks and Nature Reserves requires a licence - <https://www.environment.nsw.gov.au/licences-and-permits/scientific-licences>.

Collection of material from threatened species and protected plants also has restrictions - <https://www.environment.nsw.gov.au/licences-and-permits/protected-native-plant-licences>.

7.1.3 Plant species of the Berry Locality

Now that you have the basics to begin seed collecting, you will want to know which seeds to collect. You will get to know your land as you work and observe the things that are happening, you see the flowers, watch seed pods develop and eventually know the best time to collect seeds in your microclimate. Other indicators to look out for are increased bird and animal activity; it's often a good sign that some good food is on.

The **Berry Landcare Species List** in Section 5.3.1 lists the common plant species that are found in the Berry locality.



7.1.4 Rules for seed collection

1. Collect from multiple plants of the same species within a 100m radius
2. Collect from healthy plants
3. Collect only what you need
4. Be kind to the surroundings
5. Do not over collect from a single plant. A general guide is not more than 10% of the plants covering of seed, or 1% of the biomass. This helps with preserving the survival of the species.
6. Be careful not to infect the area you are collecting in with weed species. Seeds of weeds can find their way into a site on your tools, your shoes, vehicles etc.

7.1.5 Seed Collection Materials

Now you know the rules, what do we need to collect seed?

Bags

Bags for your collected seed, plastic is OK for short periods, but DONT leave your seeds in plastic for too long. Plastic doesn't breathe and any moisture in the bag can make your valuable seed collection rot. Paper bags are great for small amounts of seeds; you can conveniently record the details on the outside. Calico bags or feedbags are robust and will hold a lot of seed.

Tools

The tools you need will be determined by the size of the plant species from which you are collecting seed. Secateurs and fingers are all you will need for some species, but tools such as long handled pruning saws may be necessary for the larger species. Take advantage of stormy weather and scout around for fallen branches with seeds intact. Remember your personal safety when collecting seeds. Glasses, gloves, maybe even a hard hat if you are attempting to cut down branches above your head.

Drying Equipment

Most seed species need to be dried - except the fleshy covered seeds. Paper bags are sufficient for small amount of seed as they breathe and still capture the seed as it is released from the capsules. Larger seed collections may need to be dried outdoors on drop sheets or cardboard. Just allow for good ventilation by suspending slightly above ground.

Seed Extraction

Once your seeds are dry, some may take a little manual handling to release from the seed housing. *Banksia* seeds need to be extracted individually from their woody home, whereas woody fruits such as *Eucalyptus* sp. and *Leptospermum* sp. may only require a gentle tap to dislodge the remaining seeds. *Lomandra* sp. may need to be threshed by placing inside a calico bag and hitting against a solid surface. Some species need elevated temperatures to open pods, such as *Hakea*. You can speed the process along by placing pods in an oven no more than 100 degrees Celsius with the door partially open. Some of the woody seedpods can stay intact on a plant for a long time, or until a disturbing event, such as injury or death of the parent plant.

Storage and Viability

Once your seeds have been cleaned of debris and freed from their pods, they will need to be stored until you are ready to sow them. Some seeds have a brief period of viability although most will remain viable for up to two years. Some species, such as *Acacia*'s are very long lived. Old jars are good as they keep the seed dry and protected from predators. Keeping the seeds in a low temperature and at low humidity may help prolong their life. The fridge is a good place, but make sure they are well labelled.



7.1.6 Record keeping

If your seed collection is a one-off project related activity, accurate records are not so critical. Should it become a long-term focus, ensure you keep information about the collection process. This information can help in long-term vegetation mapping and may assist to other landholders if you are swapping grown plants. You may even wish to join a seed saving network. Generally, the following information should be recorded:

- Genus and species
- Date of collection
- Name of collector
- Site location/map
- Number of plants from which seed collected
- What type of plant community?
- Geology of the area



7.1.7 Propagation

You are now ready to continue to propagate.

The best information on how to do this is found on the **Growing Illawarra Natives** website. The Plant Propagation guide (prepared by Lyn Clark from Berry Public School Plant Prop and other contributors) is found at <https://blog.growingillawarranatives.org/p/blog-page.html>.

This Guide covers:

- Propagating from seed - how to collect, process and sow seeds
- Vegetative methods of propagation - making new plants without seeds
- Propagating ferns - working with spores and other fern-specific techniques
- Potting up and planting out - what to do next when you've successfully propagated a plant
- Warnings and safety advice - essential reading before you get started
- References and further reading - for when you want to know even more!

7.1.8 Further information

A Conservation Management Note on **Seed Collecting** can be found at <https://www.environment.nsw.gov.au/cpp/ConservationManagementNotes.htm>

Books:

Angus Stewart (2012) *Let's Propagate*. A plant propagation manual for Australia.

Doug and Robin Stewart (2008) *From Seeds to Leaves*.

Murray Ralph (2011) *Growing Australian Native Plants from Seed*.

Murray Ralph (1994) *Seed Collection of Australian Native Plants for Revegetation, Tree Planting and Direct Seeding*.

Mark Dunphy, Steve McAlpin, Paul Nelson, Michelle Chapman, Hugh Nicholson (2020) *Australian Rainforest Seeds. A Guide to Collecting, Processing and Propagation*.



7.1.9 Contacts

Berry Landcare

berrylandcare@gmail.com

Berry Public School Plant Propagation

berryplantprop@outlook.com

Shoalhaven Landcare Coordinator

coordinator@shoalhavenlandcare.org.au

Shoalhaven Bushcare

P: 1300 293 111

Greening Australia

www.greeningaustralia.org.au



8 Creating Habitat

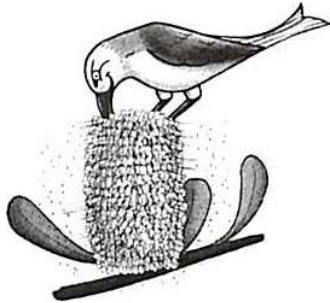
8.1 Habitat in Your Own Backyard

8.1.1 Making your garden bush & wildlife friendly

We can all make a truly positive contribution to the survival of our native fauna and flora by sharing our gardens with the wild creatures of our local bushland. The greatest threat to our native wildlife is the loss of habitat. The most dramatic impacts on the habitat of our native animal are from weed invasion and land clearing.

Habitat for wildlife has several essential elements that we can easily incorporate into our gardens to help native wildlife suffering from the impacts of habitat loss

Food



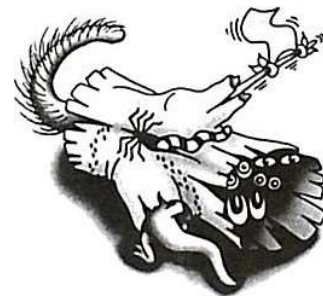
Water



Nesting sites & Materials



Shelter & Protection





8.1.2 Resources

There are many resources and websites which can assist you to creating habitat for a diversity of wildlife.

Backyard Buddies <https://backyardbuddies.org.au/> is a program run by the Foundation for National Parks & Wildlife, and provides a lot of information on creating habitat.

The **Growing Illawarra Natives** website has a list of resources which includes articles by Garry Daly on the right sort of plants to attract wildlife to your garden <https://blog.growingillawarranatives.org/p/useful-articles-and-other-resources.html>.

Birds have a whole website to themselves with the **Birds in Backyards** program through Birdlife Australia <https://www.birdsinbackyards.net/>.

The Frog and Tadpole Study Group of New South Wales (FATS) have a wonderful collection of **Frog Facts** information sheets which explain how to create frog-friendly habitats and facts of frog biology. <https://www.fats.org.au/publications>.

Wildthings Australia <https://www.wildthingsaustralia.org.au/> is based in Victoria, but has great information on native pollinators. Download the ebook [Planting for Pollinator Guide](#) .



9 Legislation

Landholders have legal rights and obligations to manage land in accordance with environmental and natural resource management law. These can be state or national.

Relevant NSW legislation includes:

Biodiversity Conservation Act 2016

The purpose of this Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development

Biosecurity Act 2015

The primary object of this Act is to provide a framework for the prevention, elimination and minimisation of biosecurity risks posed by biosecurity matter, dealing with biosecurity matter, carriers and potential carriers, and other activities that involve biosecurity matter, carriers or potential carriers.

Local Land Services Act 2013

This act established Local Land Services through which publicly funded biosecurity, natural resources management and agricultural advisory services are provided by a single organisation. Berry is in the area of South East Local Land Services.

Water Management Act 2000

The objects of this Act are to provide for the sustainable and integrated management of the water sources of the state for the benefit of both present and future generations and, in particular: Ecologically sustainable development, and to Protect, enhance and restore water resources.

National Parks and Wildlife Act 1974

The NPW Act is currently the main piece of legislation for managing and protecting Aboriginal cultural heritage in New South Wales

The ***Rural Living Handbook*** is a guide which gives practical information on the rights and responsibilities of landholders. Go to <https://www.lls.nsw.gov.au/what-we-do/plans-and-publications/rural-living-handbook> to download this book.





10 Bush Fires of the Berry Region

10.1 Bushfire History of Berry

10.1.1 Introduction

Vegetation communities in the Berry area tend to comprise of mainly moist forest or rainforest, and over the last 40 years some people could be forgiven for thinking that bush fire doesn't really happen in the Berry area. However, on closer inspection, evidence of fire is evident throughout the forests surrounding Berry, including the usually very wet escarpment areas. In fact, if you search 100 or more years into the past, you will find multiple accounts of several serious bush fires that have occurred around Berry.

Wildfire unsurprisingly, is consistently preceded by hot dry conditions. Indeed, the summer of 2019/2020 was the catalyst for perhaps one of the most devastating and widespread bush fires ever recorded in eastern Australia. Although, on this occasion, the Berry area was largely spared of any significant fires, the Shoalhaven region experienced at least three years of drought and hot dry weather especially in the winter to summer of 2019. Massive bush fires burned across most of eastern Australia taking many homes, lives and decimating wildlife and native habitat. The following list is a brief chronological summary of bushfires that have affected the Berry area over the previous 150 years.

10.1.2 Chronological history

1968 The most recent serious bush fire to affect the Berry area was in September 1968 when a fire, preceded by three years of below average rainfall and an unseasonably hot dry August, started on 14 September at Bundewallah. The fire burned along the escarpment fanned by hot north-westerly winds to the north of Berry. Bruce McIntosh, Shire President at the time recalled "In that fire the escarpment was ablaze basically from Budgong to Wollongong – an unbelievable sight and an unstoppable fire". That was the last time the whole escarpment was alight, but it was not the first.

1946 A severe bushfire in the Woodhill, Wattamolla, Broughton Vale areas north of Berry, was preceded by extremely dry conditions leading up to the fire, which was driven by a strong, westerly wind. The Berry Fire Brigade was called out to save the house of Mr and Mrs J. Coulson.

1945 Berry forms its first bush fire brigade.

1939 Following two years of drought (later known as the World War II Drought), extreme heatwave conditions hit eastern Australia in January 1939. Areas of the South Coast were very dry and hot with several consecutive days of temperatures over 40 degrees. In December 1938, Penrith recorded its hottest recorded temperature at that time of 45.3 degrees Celsius. This period is regarded as the most extreme heatwave to affect south-eastern Australia during the twentieth Century.

The Black Friday bushfires in Victoria on the 13th of January saw 2 million hectares burn across the state with 71 lives lost. Widespread fires broke out across NSW and the ACT including the Blue Mountains, Bathurst, Castle Hill, Cronulla, Nowra, Ulladulla, Mittagong and Wollongong where six people died. The 14th of January was known locally as 'Black Saturday' and 'all the mountains around Berry were ablaze'. Bruce McIntosh was a boy at that time and remembered vividly the intensity of the fire which 'was so great it tuned night into day'. The highway was blocked, and people genuinely feared for their lives'. Bruce McIntosh noted ...the whole escarpment was alight ... in 1939'.

1899 Farmers around Broughton Vale were 'kept up all night combating bush fires' which burned on 16th May 1899. [Editor's note: for fires to be bad in May, the area must again have been preceded by dry and unseasonably warm weather in the autumn leading up to the fire].

1895 Farms were devastated by bush fires in September of 1895 and, in particular, the localities of Broughton Vale, Coolangatta, Broughton Creek and many others.



1874 Another dry season preceded serious bush fires driven by westerly winds burning Broger's Creek and Broughton Vale areas.

10.1.3 Resources

For more information on the history of bushfires within the Berry region, please visit the following sources:

Antill, R.G. 1982 Settlement in the South. Weston & Co Publishers Pty Ltd Kiama

Australian Institute for Disaster Resilience 'Sydney and southern NSW bushfires, 1939'
<https://knowledge.aidr.org.au/resources/bushfire-sydney-and-southern-new-south-wales/>

Australian Institute for Disaster Resilience 'Victoria January 1939 Black Friday bushfires, 1939'
<https://knowledge.aidr.org.au/resources/bushfire-black-friday-victoria-1939/>

Bureau of Meteorology (Australian Government) Berry (68003), Record of monthly rainfall 1886 – 2018.
http://www.bom.gov.au/jsp/ncc/cdio/weather/Data/av?p_nccObsCode=139&p_display_type=dataFile&p_startYear=&p_c=&p_stn_num=68003

Blue, H. 2018 'A History of Bushfires in the Berry Area' Town Crier Feb 2018 p.7

Daily News 16 January 1939 'Four N.S.W. Burned to Death' (Sydney NSW) p.1

Duggin, J.A. 1976 Bushfire History of the South Coast Study Area. CSIRO Division of Land Use Research, Canberra. Technical Memorandum 76/13 July 1976.

Evening News 19 May 1899 'Brevities' (Sydney NSW) Friday p.4.

Kiama Independent, and Shoalhaven Advertiser 1 October 1874 'Broughton Vale' p.2.

King, A. 2002 'A Short History of the Wollongong Bushfire Brigades Part 2' Illawarra Historical Society Mar/Apr p.7-14.

Northern Star 24 May 1899 'South Coast News' (Lismore NSW) p.5.

Shoalhaven Heads History – 4 <https://shoalhavenheads.net.au/shoalhaven-history-4/>

South Coast Register 5 Nov 2012 'The escarpment from Budgong to Wollongong was ablaze'
<https://www.southcoastregister.com.au/story/572756/the-escarpment-from-budgong-to-wollongong-was-ablaze/>

South Coast Register 31 October 2012 'Real fire risk on escarpment'
<https://www.southcoastregister.com.au/story/478271/real-fire-risk-on-escarpment/>

Sydney Mail and New South Wales Advertiser 12 September 1874 'Broughton Creek' p339.

Sydney Morning Herald 13 September 1946 'Fires Still Burn In Country' p.1.

Sydney Morning Herald 11 January 2019 Lessons Learnt (and perhaps forgotten) from Australia's 'worst fires' by Peter Hannam <https://amp.smh.com.au/environment/climate-change/lessons-learnt-and-perhaps-forgotten-from-australia-s-worst-fires-20190108-p50qol.html>

The Kiama Independent and Shoalhaven Advertiser 17 September 1895 'Local and General Items' p.2.

Ulladulla Info 'Bush fire nearly destroys the town of Ulladulla' <http://www.ulladulla.info/bush-fire-nearly-destroys-the-town-of-ulladulla>



10.2 Bushfire Management

10.2.1 The threat of bushfire

Living with the bush is part of living in Berry, but so too is living with the risk of fire. Fires in dense bushland can be intense, hot and fast moving, producing embers that can travel many kilometres ahead of a fire, destroying houses by burning twigs and leaves carried in the wind and landing on or around the house. Similarly, grass fires that occur in paddocks can start easily, produce huge amounts of heat and move faster than that of bushfires, destroying both houses and crops.

While there are elements of a bush fire that you cannot control, like the weather, there is a wide range of planning and preparation activities that you can undertake which will dramatically increase the chances of you, your family and your home surviving in the event of a bush fire.

10.2.2 Protecting your home and property

There are some practices that may help minimize the damage caused to your home in a bush fire. As a rural landowner, you should plan and prepare for fire.

The NSW Rural Fire Service provides the information needed to plan and prepare for bush fires. <https://www.rfs.nsw.gov.au/plan-and-prepare>.

Have your Bushfire survival plan ready so that you will know what you will do if there is a bush fire near you.

Berry is under the Shoalhaven Rural Fire Service - **contact 02 4424 4424**.

In the case of an emergency, please dial Triple Zero 000.

10.2.3 Hotspots Fire Project

The Hotspots Fire Project is a NSW training program which provides landholders and land managers with the skills and knowledge needed to actively and collectively participate in fire management planning and implementation for the protection and enhancement of biodiversity conservation. The project is delivered through the NSW Rural Fire Service and the NSW Nature Conservation Council. Find out more at <https://www.hotspotsfireproject.org.au/>.

Some Berry landholders have attended the 2-day Hotspots training to learn about fire and the environment. Keep an eye out for more opportunities.

There are many resources available if you have not yet attended a workshop. Berry is in the Southern Rivers Region and relevant resources can be found for this region. <https://www.hotspotsfireproject.org.au/region/southern-rivers-cma>.



11 Resources: Further Reading and Contacts

11.1 Books

Weed identification

Adam Muyt (2001). *Bush Invaders of South-East Australia*. Richardson, RG & FJ

Fiona Richardson, Robert Richardson, Rosamond Shepherd, 2006. *Weeds of the South East: An Identification Guide for Australia*. Richardson, R G & F J

Bush regeneration

Bradley, J. 2002. *Bringing Back the Bush: The Bradley Method of Bush Regeneration*. New Holland.

Buchanan, R. 1989. *Bush Regeneration: Recovering Australian Landscapes*. TAFE NSW.

Buchanan, R. 2009. *Restoring Natural Areas in Australia*. Department of Industry and Investment.

Native plant identification

Leon Fuller (2011). *Wollongong's Native Trees*. Kingsclear Books

Kevin Mills, Jacqueline Jakeman (2011) *Native trees the NSW South Coast*. Envirobook.

Les Robinson (2003). *Field Guide to the Native Plants of Sydney*. Simon & Schuster.

Alan Fairley, Philip Moore (2010) *Native Plants of the Sydney Region: From Newcastle to Nowra and west to the Dividing Range* Allen & Unwin

Books and Manuals to download

NSW Weed Control Handbook <https://www.dpi.nsw.gov.au/biosecurity/weeds/weed-control/management-guides/noxious-enviro-weed-control>

Rural Living Handbook <https://www.ils.nsw.gov.au/what-we-do/plans-and-publications/rural-living-handbook>

Department of Planning Industry and Environment Conservation Management Notes

<https://www.environment.nsw.gov.au/cpp/ConservationManagementNotes.htm>.

Nine management notes that cover **Wildlife on your property** and **Managing bushland and wildlife habitat**.

11.2 Websites

The **Growing Illawarra Natives** Website has a 'Plant Finder' a list of resources which includes articles on native3 plants <https://blog.growingillawarranatives.org/>.

AABR (Australian Association of Bush Regenerators) <https://www.aabr.org.au/> .

View the videos about post fire weed control <https://www.aabr.org.au/do/post-fire-bush-regeneration-map-and-resources/> .This is a series of **6 videos**. Although initially for post fire weed control, the videos are about carrying out bush regeneration and covers weed removal techniques.



Department of Primary Industries <https://www.dpi.nsw.gov.au/biosecurity/weeds>

Biosecurity and weeds including the WeedWise program.

<https://www.dpi.nsw.gov.au/biosecurity/weeds/weed-control/management-guides/noxious-enviro-weed-control>

NSW Flora Online. PlantNET

<https://plantnet.rbgsyd.nsw.gov.au/floraonline.htm> Search botanical descriptions of native plants and maps showing their distribution.

International Environmental Weed Foundation (IEWF) although much of the information is Sydney based, the Web Weed Lookup http://www.iewf.org/weedid/iewf_front_id.html has a great photo gallery which will help you identify weeds

11.3 Where to Get Advice and Help

Berry Landcare

Email: berrylandcare@gmail.com

<https://landcare.nsw.gov.au/groups/berry-landcare/>

Berry Public School Plant Prop

Local native plants and advice

Lyn Clark - P: 4464 3911 Lyn-clark@outlook.com.au

[Berry Plant Prop Facebook Page](#)

Other nurseries. See Nursery List Section 5.1.5

Shoalhaven Landcare

(Berry Landcare is a member of Shoalhaven Landcare) Shoalhaven Landcare runs a number of projects. The resources page on the website has a number of useful publications.

<https://www.shoalhavenlandcare.org.au/>.

Contact the co-ordinator. Email: shoalhavenlandcare@gmail.com Phone: 0410 961 449

Shoalhaven City Council

Weeds management and biosecurity; feral animals; Bushcare and Parkcare (some of Berry Landcare groups are part of Council's programs).

<https://www.shoalhaven.nsw.gov.au> phone 1300 293 111

Local Land Services

<https://www.lls.nsw.gov.au/>

Feral Animals and feral animal control training

Berry is in the LLS South east region

<https://www.lls.nsw.gov.au/regions/south-east>

Berry LLS Office 13 Schofields Lane PO Box 63 Berry NSW 2535

Telephone: 02 4464 6000 Office hours: 8:30am - 4:30pm

Wildlife Rescue South Coast

Phone: 0418-427-214 Kiama to Batemans Bay, Southern Highlands and Kangaroo Valley

<https://www.wildlife-rescue.org.au/> .

The website has information on how to help animals such as using wildlife friendly fencing.