

Devilbend Natural Features Reserve

An excursion and fieldwork resource for schools



Congratulations for taking the leap outdoors!

Excursions and field trips are an important part of the educational experience for students, offering hands-on, concrete experiences that are important for reinforcing key concepts taught in the classroom.

Our aim is that every student leaves a park or reserve with a greater appreciation not only of its unique values, but how these are connected to other places and larger issues, and a desire and the know-how to get involved in making a difference.

Our excursion/fieldwork resources aim to help students:

- develop a sense of wonder, curiosity and respect for our parks and the people and environments they support
- develop their knowledge of their own locality and region and how places are connected
- understand the changes that are occurring in our parks and what strategies are being employed to manage these changes
- consider some of the complex interrelationships between the physical environment and the flora, fauna and fungi that live in our parks
- become informed, responsible and active citizens who contribute to the protection of our special places.

This resource is designed to provide teachers with ideas for planning exciting and experiential learning activities out in our beautiful parks, reserves and waterways.

We would love to hear about ways we can improve this resource to support teachers who take their lessons outdoors. Please contact education@parks.vic.gov.au with your feedback.

Why visit?

A haven for waterbirds and walkers, Devilbend Natural Features Reserve includes the largest inland water body on the Mornington Peninsula, and once played an important role as a water source for Melbourne. Located 55km south-east of Melbourne in the township of Moorooduc, the lowland forest, reservoirs and shoreline provide valuable habitat and important green space for recreational activities such as non-powered boating, walking, cycling, horse riding and fishing. The walking trails around the reserve offer students an opportunity to investigate land use, geological processes that have influenced landscape structure, ecosystem health and functioning, and native plants and animals.

For Teachers

This self-guided excursion guide is designed to be linked to the Victorian Curriculum for the subjects of geography, science, and outdoor and environmental studies, but can be enjoyed by a wide range of students who want to explore, discover and learn about our parks. It is suitable and scalable from Levels 3 – VCE. Some suggested linkages to the Victorian Curriculum are provided below:

Subject	Level	Content descriptions
Geography	3-4	Data and information
		Diversity and significance of places and environments
	5-6	Place, space and interconnection
		Data and information
		Factors that shape places and influence interconnections
	7-8	Data and information
Science		Water in the world
		Landforms and landscapes
	9-10	Place, space and interconnection
		Geographies of interconnection
	VCE	Unit 3 – Area of Study 1 (Land use changes)
	3-4	Biological sciences
Environmental Science		Earth and space sciences
	5-6	Biological sciences
	7-8	Biological sciences
	9-10	Biological sciences
	VCE	Unit 2 – Area of Study 3 (Practical investigation)
		Unit 3 – Area of Study 2 (Is development sustainable?)
Outdoor and Environmental Studies	VCE	Unit 1 – Area of Study 1 (Motivations for outdoor experiences)
		Unit 2 – Area of Study 1 (Investigating outdoor environments)
		Unit 2 – Area of Study 2 (Impacts on outdoor environments)
		Unit 4 – Area of Study 1 (Healthy outdoor environments)
		Unit 4 – Area of Study 2 (Sustainable outdoor environments)

The excursion can be done in 1–2 hours, or you can opt to spend a day completing multiple activities in the park. The [Devilbend Natural Features Reserve Management Plan 2010](#) can be used for in depth case studies for the VCE subjects and units listed.

For additional information on the park, download the [visitor guide](#) or visit the [Devilbend Natural Features Reserve](#) webpage for further information including facilities, management plans, maps and images.

Before you go

Make sure you have reviewed the information provided for planning an excursion at <http://parkweb.vic.gov.au/learn> for safety and permit requirements and have checked the facilities available.

All school groups are required to let the local Parks Victoria team know you are coming. Please complete a Group Activity Statement downloadable from www.parkweb.vic.gov.au/learn and email to: groupactivities@parks.vic.gov.au at least four weeks prior to arrival. This will assist us to alert you to any park closures, storm damage or management activities such as planned burning or pest animal programs that may affect your visit. It also forms part of your group's emergency management plan and provides quick access to emergency contacts, should your group need assistance.

You will be visiting a natural features reserve, an important home to many species of plants and animals, some found in only a few other areas, and others nowhere else in the world! Please remember to keep to the paths, don't pick or take any vegetation and take your rubbish home with you.

Collecting data

We encourage you to gather primary data during your excursion to support a truly immersive and hands-on experience. Pictures, drawings and records of sightings are all easy to take and don't require a research permit. If you'd like to do something that involves moving off the paths, including transects or quadrats, please complete an [application for a research permit](#).

Structuring your excursion

Devilbend Natural Features Reserve is located off Graydens Road, Tuerong (Melway Map 152 J3). The picnic area is open from sunrise to sunset and allows for safe bus access and parking. The reserve is accessible to pedestrians 24 hours a day via a small carpark located in front of the main entrance gate on Graydens Rd. From this carpark you can access multiple trails around the reserve, including Daangean Point Track (1.5km), Western Shoreline Track (1.2km) and Devilbend Circuit Track (11.5km). These trails offer multiple opportunities to conduct fieldwork, social studies of park use or impact assessments, or to discover the many species that call the park home. There are also plenty of toilets, shelters and picnic facilities in the Daangean Point Picnic Area if you'd like to extend your stay.

Learn and discover

1. Landscapes and landforms

Devilbend Natural Features Reserve is part of the South Victorian Uplands Region, shaped up to 30 million years ago. Prior to quarrying, Devilbend Creek Gorge was 10 metres deep and extended south several hundred metres from the dam wall. Quarrying for the construction of the dam wall revealed the underlying geology of the reserve that can be seen today. The rocks found here include sandstones, slates and cherts and are among the oldest rocks on the Mornington Peninsula.

2. Water in the landscape

Prior to European settlement, Devilbend Creek naturally wound through the landscape, providing important habitat for many species. During the construction of Bittern and Devilbend reservoirs, the landscape was significantly modified; Devilbend Creek was realigned and the landscape became inundated by water. The two reservoirs acted as a primary water source for Melbourne, and were used for storage and supply until they were decommissioned in 2001.

Devilbend Natural Features Reserve is now the largest inland waterbody on the Mornington Peninsula. With almost 250 hectares of water surface area, the two reservoirs provide vital habitat for waterbirds and shorebirds, as well as various opportunities for recreation.

3. People on the land

The landscapes and landforms of the reserve are intrinsic elements of the Country of the Bunurong people, the Registered Aboriginal Party for the area. The reserve is of considerable aesthetic, historical, scientific and social value to the Bunurong people and has been assessed as being of State significance for its unique combination of cultural and environmental values in a populated area. Evidence of quarries, campsites and the manufacturing of stone tools by the Bunurong people are estimated to date back 1000-2000 years before present (BP).

Early European settlement saw significant land clearing for orchards, grazing and timber on the Mornington Peninsula. In response to growing demand for water from the Melbourne population, large areas of farmland around the Moorooduc township were purchased for the construction of additional reservoirs.

Bittern Reservoir was built in the 1920s, and Devilbend Reservoir was opened in 1965 by Premier Bolte after nine years of construction. In the late 1990s, the reservoirs became redundant after a pipeline was commissioned from Cardinia Reservoir. In 2006, most of Devilbend was transferred to the Crown and the Minister announced that the area would be reserved as a Natural Features Reserve under the *Crown Land (Reserves) Act 1978*. Devilbend Natural Features Reserve was gazetted on 8 March 2007 for the protection of natural features under Section 4(1) of the *Crown Land (Reserves) Act 1978*. Natural features reserves are important because they provide the only suitable habitat for many common species that are or were once widespread in land types that have been cleared. The Devilbend Natural Features Reserve Management Plan was approved and published in May 2010.

4. An important ecosystem

Devilbend supports more than 200 species of native flora and 195 indigenous species of fauna, including multiple threatened species. The reservoir is recognised as an 'Important Bird Area' by BirdLife Australia as being globally important for the conservation of bird populations. There have been 158 bird species recorded here, including the Blue-billed Duck (listed as endangered, Department of Sustainability and Environment, 2013), and the reserve is the only known nesting site of the White-bellied Sea-Eagle on the Mornington Peninsula (listed as threatened under the *Flora and Fauna Guarantee Act 1988*).

The reserve is an important remnant of native vegetation, as much of the surrounding land has been cleared for orchards and grazing. The reserve currently consists of 422 hectares of native vegetation and 328

hectares of non-native vegetation (predominantly in the form of cleared grazed land), and a 5 hectare picnic area. As more indigenous vegetation is restored within the reserve, Devilbend can act as an extending link to other remnant vegetation on Mornington Peninsula.

5. Managing the park today

Introduced plants and animals (weeds and pests) threaten the ecological values of Devilbend Natural Features Reserve. Parks Victoria manage these threats through the park management plan, available on Parkweb. Parks Victoria also work closely with Friends groups, volunteers and reserve neighbours to control weeds and pests, and to monitor ecosystem health.

Devilbend and Bittern reservoirs provide unique freshwater habitats, therefore ongoing water monitoring is extremely important. Devilbend Waterwatch have ongoing volunteer opportunities to monitor and report on the health of these aquatic habitats.

The maintenance and improvement of visitor facilities is another part of park management. Parks and reserves are for the enjoyment and education of people, as well as to protect the natural and cultural values found within them, so it's important to provide and maintain car parking, toilets, picnic tables and other facilities to support visits to our parks.

Case Study: Flora and Fauna Assessment, and Recommendations Report

In 2008, Parks Victoria commissioned Practical Ecology Pty Ltd to complete an extensive flora and fauna assessment of the newly formed Devilbend Natural Features Reserve (NFR) and create a recommendation report for the future management of the reserve. Below are the key findings and recommendations of this report.

Curriculum links

Geography: Levels 7 and 8

Human causes of landscape degradation, the effects on landscape quality and the implications for places (VCGGK119)

- analysing the effects of erosion and sedimentation produced by human activities on landscape quality, including farming and recreation,
- examining the effects of mining and quarrying, and urban development, on landscape quality and how this affects places.



Flora and Fauna Assessment, and Recommendations Report

Devilbend NFR plays a vital role in linking habitats along the Mornington Peninsula and makes an important contribution to native vegetation in the area. Looking at the flora and fauna, the vegetation types and the habitats the reserve provides, Devilbend NFR is considered of State significance. The reserve supports one of the largest 'surrogate' wetlands in the Melbourne area and Gippsland Plains Bioregion. Most of the reserve has a long history of land use change, generally for agriculture and water storage.

There are eleven Ecological Vegetation Classes present; eight are considered endangered in the Gippsland Plains Bioregion due to their poor conservation status. All other EVCs are vulnerable or rare. The reserve supports large, relatively intact patches of Lowland Forest (12.7% of total area) and Grassy Woodland (6.6% of total area). There are also relatively large areas of Swamp Scrub, which is State significant due to its highly depleted nature and low level of protection in conservation reserves. There are also other important vegetation communities including swampy woodlands and wetland vegetation fringing both reservoirs and low-lying areas.

A total of 216 fauna species have been recorded in the study area from this and previous surveys. These include:

- 20 mammals, 7 introduced
- 168 birds, 10 introduced
- 11 reptiles, none introduced
- 6 frogs, none introduced
- 10 fish, 3 introduced
- 1 crustacean, introduced
- 19 State significant birds have been recorded in Devilbend NFR, with most records been contemporary (within the last 5 years).
- Two 'signature' species to the reserve, the White-bellied Sea-Eagle and Blue-billed Duck are regularly recorded.
- One Nationally significant species Dwarf Galaxias is listed under the Environment Protection and Biodiversity Act 1999 (EPBC Act) has been recorded in the catch drains in 2001.
- Another EPBC Act listed species, the Growling Grass Frog has been recorded close to the reservoir in 1976, but not since.
- Eleven species are listed under the Flora and Fauna Guarantee Act 1988 as threatened. In addition, numerous other fauna species are considered to be of at least regional significance.

Key management recommendations:

- Undertake weed management in the reserve by focusing on maintaining high-quality remnants, then moving toward lower-quality areas.
- Initiate pest animal control program and cooperation with adjacent landholders.
- Undertake research and examine limitations to fire in the reserve, then undertake and implement ecological fire management plan.
- Promote and manage natural regeneration of native vegetation and fauna habitat, with a focus on linking remnants and regenerating endangered Ecological Vegetation Classes.
- Work with leaseholders to review and change lease agreements for grazing in paddocks and work with the Mornington Peninsula Shire and adjacent landholders to implement appropriate land use controls to ensure adjacent land use is compatible with conservation of

the reserve. This includes fencing of mature trees in paddocks as a source of natural regeneration.

- Establish monitoring plots to measure the rate of natural regeneration, weed cover and photo points in key sites. Work with other organisations and groups to establish long-term monitoring to measure change and threats to flora, fauna and ecological processes.

Activity

Pick one of the reports key recommendations and write up a 1-page management plan for Devilbend NFR focussing on your chosen recommendation. Including:

- How you would analyse the landscape degradation (e.g. level of erosion or water quality).
- The possible human causes of this degradation.
- List both the short term and long-term objectives of the plan.
- A section on managing the reserve for the 'signature' species found here.

Questions

1. How has changing land use affected the reserve? (e.g. agriculture, damming, recreation use).
2. How does the retainment of green spaces in peri-urban and urban areas benefit the community?

References

McCaffrey, Nick, Andrew Picone, Gidja Walker, Joy MacDonald, and Ann Williamson. (2008). Flora and Fauna Assessment and Recommendation Report – Devilbend Reserve. Melbourne. Practical Ecology Pty Ltd.

Discover and reflect

You might like to enhance your excursion with some activities and inquiries that help students record and extend their learning back into the classroom. You might like to complete one or more of the following:

1. Take photos to create an annotated photolog or poster of your excursion to share with classmates. You could use social media to share it with friends.
2. Create a short video that helps tell a story to share with classmates.
3. Consider and discuss how people living here thousands of years ago may have interpreted the landscape differently to how we understand its origins today.
4. Think about how the reserve might have looked before European arrival. List the ways that Aboriginal people might have used the reserve. Compare this list to the ways that Europeans used and altered the reserve.
5. Discuss possible impacts of increased visitation on some of the popular sites you have visited. If you were a Park Ranger, how would you manage these impacts?
6. Using Google Earth and the time clock, describe the area around the reservoirs and how it has changed over time.

7. Choose a molecule and trace it through the reserve. How does it enter the system and where does it travel to? Identify how different organisms use this molecule to survive.
8. Create a sound map of various points around the reserve, taking a series of 30-second audio recordings, referenced back to points on a map. Students can also record their audio observations on paper, using lines made from a central point to indicate the direction, type and frequency of sounds they hear, and whether it adds or detracts from the environment.
9. Discuss the role parks play in connecting people to their environment, or influencing personal relationships to nature.
10. List the health benefits of green spaces in urban environments. What kind of activities are possible in peri-urban environments like Devilbend Natural Features Reserve, and how do these activities align with the health benefits you listed?
11. Download PDF Avenza Maps App and a free copy of Devilbend Natural Features Reserve to record your fieldwork / excursion and upload photos and notes.

Additional resources

There are some excellent resources available online to assist with excursions. Check out [Melbourne Water's](#) website for lesson plans and fact sheets on frogs, water quality, the urban water cycle and the water supply history of Melbourne. [WaterWatch \(NSW\)](#) have excellent printable identification guides for macroinvertebrates. You can also contribute to citizen science by joining [iNaturalist](#) or [ClimateWatch](#) and input your data online or using their apps. The [Action Statement: Blue-billed duck](#) and [ARI Technical Report](#) on the Flight Initiation Distance of the Blue-billed duck provide additional useful information.

Get active

Contact the [ParkConnect](#) team if you would like to get your students involved in some hands-on volunteer activities in Devilbend Natural Features Reserve.

Parks Victoria respectfully acknowledges the Traditional Owners of what is now known as Victoria. For many thousands of years they have lived in harmony with, and carefully managed the Country for which they have a deep spiritual connection. Contemporary Aboriginal people are proud of their ancestry and in addition to their inherent rights, they have spiritual and cultural obligations to ensure that their ancestral land and culture is managed responsibly and appropriately.