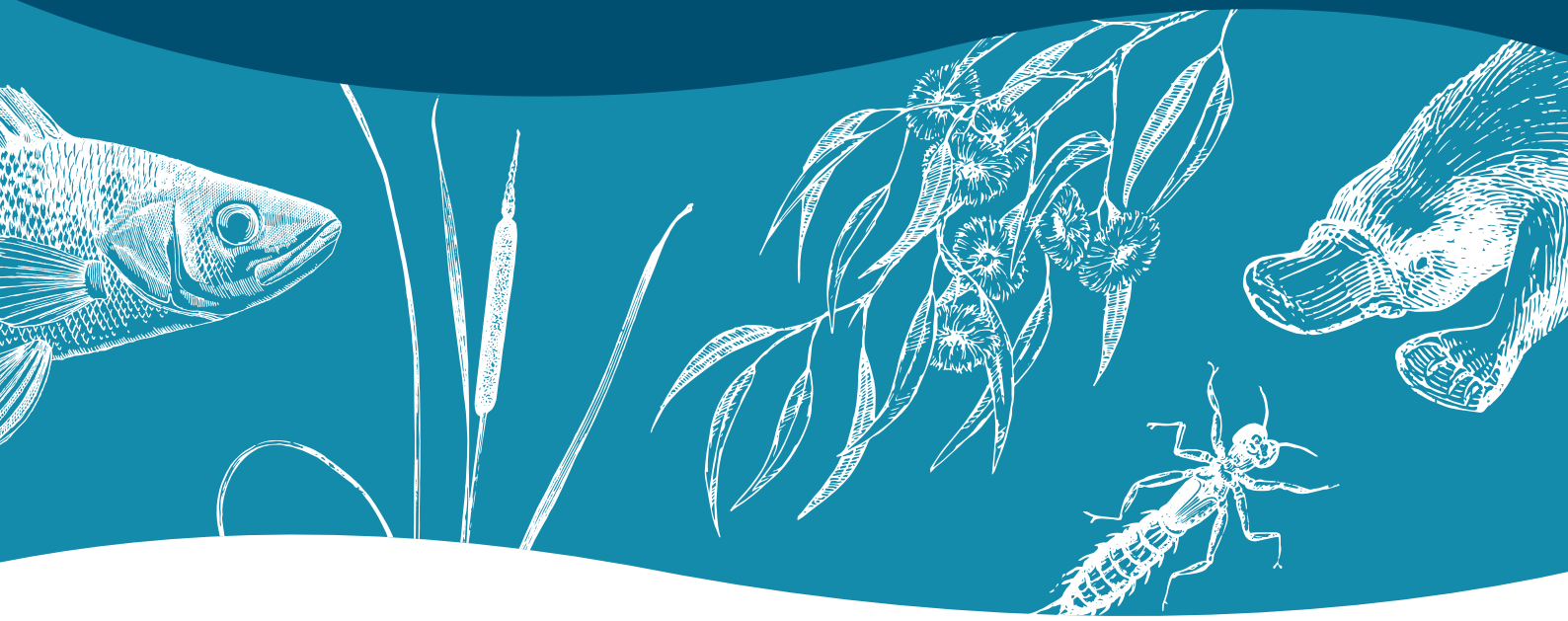
WETLANDS HABITAT

A teacher's guide to exploring the plants and animals in wetlands



CORANGAMITE CMA

WATERWATCH Corangamite Communities Caring for Catchments

EstuaryWatch

Federation UNIVERSITY • AUSTRALIA

CONTENTS

Acknowledgements

This resource was developed by education students participating in a Team Enterprise course at Federation University Australia (Mt Helen campus) in conjunction with Corangamite CMA. The course has been developed to allow students to use enterprise within the wider community. Federation Students, Brianna Renshaw, Leah Stephens, Tess Emerson-Jones and Justin Wilson created this resource to assist teachers with undergoing a unit around wetlands.

The amazing photographs of the wetland birds were taken by Trevor Pescott. We would like to thank Trevor for his generous contribution.

EXPLORING WETLANDS

About this guide

The primary goal of this resource is to develop awareness around wetlands, wetland habitats and the importance of wetlands in our world.

The Wetlands Habitat education kit provides teaching resources and lessons for teachers and educators around different areas of the wetland. The kit is available for loan to schools in the Corangamite Catchment Management Authority (CMA) region and has been created to support teachers in addressing these areas in the classroom to advance students understanding in this area.

There are a number of different resources that may also assist in developing understanding of wetlands such as the River Detectives online resources. These resources are listed at the end of the lesson sequence. However, the resource would be evidently more effective if it were to be complete in conjunction with a range of supporting resources.

How to use this guide

The activities within this guide address:

- What a wetland and what a habitat is?
- Animals present within the wetlands
- Why we need wetlands and the habitats evident in wetlands.
- How to support growth within wetlands.

There are six lessons within this lesson sequences, in which address the above topics. Each lesson has a main activity and also goes on with additions and adaptations that can be made depending on the year level. Please note that these are only guides and you are welcome to take your teaching any direction you wish.

Supporting worksheets can be found within appendices and are will assist to clarify and supporting understanding within each topic. Lessons within the guide will also refers to the wetlands education kit. This kit contains resources that will assist in the teaching and learning of this lesson sequence. The resources include props and posters.

Contact Corangamite CMA to book the Wetland Habitat education kit.

Email: Info@ccma.vic.gov.au
Phone: (03) 5232 9100

INTRODUCTION

What is a wetland?

A wetland is an area of shallow water, that is either fresh or salty, that is standing or moving over the land. Large lakes, oceans and sea are often excluded, however the shallow edges of lakes and seas are in fact wetlands. The water depth can be no more than six meters to be included as a wetland. Wetlands can be both natural or artificial and permanent or temporary. Wetland are found throughout the world.

What is the importance of wetlands?

Wetlands today provide a number of functions including carbon capture. The plants and organic materials in wetlands are a repository for carbon and reduces global carbon dioxide levels helping to clean the atmosphere. Peaty wetlands can be a useful source of heat and a soil additive for gardens

Wetland plants gather their mineral elements directly from the water that moves past their roots. Water that passes through a wetland contains an abundance of productive nutrients, these are considered fertilizers. They result in a large growth of algae and can cause serious imbalance in the aquatic ecology. The removal of these elements cleans the water before it continues to move downstream.

Wetlands are also able to absorb excess water that could otherwise create damaging floods throughout the world.

Over the world, wetland ecosystems are under continuous pressure as they are modified and developed. The animals and plants dependant on these important ecosystems are continually under threat. By learning more about our local wetlands we gain an appreciation of the links between our environment and the diverse range of life they sustain.

Different types of Wetlands

Shallow freshwater wetlands

Freshwater lakes and ponds are found all over the world. Depending on the climate in which the water present the wetlands will contain different plants and animals, but many of the main features are the same. Water more then four meters in depth, generally contains only microscopic forms of plant life. Plants that take root to the bottom and have floating leaves can grow in the shallower areas. Animals, are found all around shallow freshwater wetlands, including microscopic zooplankton, large fish and swimming birds.

Swamps, marshes and reed beds

A wetlands that is predominantly emergent aquatic plants, such as reeds and sedges, is called marsh or a reed bed. Swamps are dominated by trees. The water is normally shallow, usually less the two meters and in drier periods sometimes less with 30 centimeters. Beneath the surface of the water, the plant roots and new shoots create vegetation of a dense mass, within this vegetation many types of invertebrate animals live.

Billabongs, lakes and lagoons

These wetlands have open water and may or may not be permanent as they dry and reflood. Lagoons will have less open water. Billabongs are located alongside rivers and show the course of old river channels. There may be dead trees present in the water with reeds around the shoreline.

Fens, bogs and peatlands

These wetlands have a water table below the surface of their soil. They are still considered wetland habitats and the soil is always moist. Water flows through fens from a catchment and through them to drainage steams. In winter or during a flood fens can be covered with water, but generally dry out in the hotter seasons. Fens are featured mostly in the northern hemisphere.

Coastal Wetlands and mangroves

The flatter and quieter shores called depositional shores, often develop in areas such as bays and estuaries, where the water moves slower. It is with in these waters that coastal wetlands are likely to develop. Coastal wetlands are often found in areas where the river meets the ocean and may be fresh or salty. Mangroves are plants with special adaptations to tidal inundation.

Saltmarshes and mudflats

These wetlands are found along coastal shorelines exposed to seawater. Mudflats form when mud is deposited by tides or rivers. Saltmarsh will have different vegetation zones depending on how often saltwater reaches the various plant communities.

Some animals found in Wetlands

Mammals of the wetlands

Many mammals are present within the wetlands. In Northern parts of the world the most common mammal found in wetlands are beavers. In southern Asia the most common mammal present in the wetland is the water buffalo. The wetlands with Africa are grazed by many mammals including kob, waterbuck and lechwe. However, here in south-east Australia the platypus and the Eastern Water Rat are two mammals which are often found within our wetlands. Other mammals that are present within or around Australian wetlands include little pied bat, the koala and the common planigale. As well as, ringtail possums, brown antechinus brushtail possum, bush rat and eastern chestnut mouse.

Birds of the Wetlands

Birds use wetlands as a source of food and breeding sites, therefore it is evident why so many birds use wetlands as their habitat. Food for birds, whether it be plants or animals are made available within the wetlands, both on the surface and under the water. Many birds found within the wetlands are able to dive for their food. The main groups of birds within the Australian wetlands include grebes, pelicans, cormorants, long-legged wading birds and waterfowl, as well as a group known as 'waders', who come to Australia to feed and roost and then return home to breed. These include birds such as black swans, wood ducks, grey tails and pacific black ducks.

Fish, amphibians and reptiles

The wetlands environment are very important to a large range of Australian fish species. Some fish spend all their life in the wetlands, whereas others come and go to rivers or the sea. Some of the fish that are found within Australian wetlands include blue-spot gobi, black bream, common galaxias, flat-headed gudgeon and flat-tailed mullet.

Many reptiles and amphibians use wetlands are source of habitat at least stage within their life cycle such as green tree frogs. Some reptiles that use this environment for their habitat include eastern blue-tongue, black-bellied swamp snake and eastern blue-tongue.

Bugs of the Wetlands

Water bugs are animals with a large presence within wetlands. Bugs that may be evident within any wetland that you choose to explore include:

Stonefly Nymph

Lives on stones in the fast flowing sections of creeks or amongst reeds in slow moving water. Is very sensitive to poor water quality. Stonefly nymph eat decaying plants. They can delay their development during droughts and wait for the rain.

Mayfly Nymph

The mayfly nymphs live at the bottom of steams for spring and summer eating dead plants and leaves. The mayfly metamorphoses to adult form and flies from the surface of the water to live only for a day or several hours.

Caddisfly Larvae

Found amongst rocks branches and plants. Scraping algae from rocks and hunting for small invertebrates to eat. Builds myself a protective case out of leaves, sand, reeds or sticks and drag it around.

Backswimmer

Backswimmers are found in deeper wetland water levels and can tolerate poor water quality. Eats other small bugs, tadpoles and small fish.

Water Boatman

Water boatman are normally found towards the surface area of a wetlands. Water boatman eat algae and other small invertebrates. Can fly from one water source to another.

Dragonfly Nymph

Live clinging to emergent plants. Dragonfly Nymth are sensitive to poor quality water. Is a carnivore and catch small creatures with my extending mouthparts.

Some of the problems facing Wetlands

- Wetlands getting turned in to the farmland
- Highly populated areas and construction over wetlands
- Climate change
- Tourism activities in wetland areas
- Dams changing the flow of water
- Introduction of new species
- Over exploitation of wetland materials
- Hunting
- Fires

UNIT OUTLINE

This unit has been developed using the Victorian Curriculum from Foundation to Year 6. It has also been developed with the consideration of the type of learning undertaken within the sequence.

Part	Subject Area	Page
Lesson 1: Defining what is a wetland?		8
Lesson 2: Mystery Box		9
Lesson 3: What animals are in a wetland?		10
Lesson 4: Wetland habitats		11
Lesson 5: Animals and their lifespan		12
Lesson 6: Impact of humans on habitat		13

Activity Name	Page	*Activity Type:* Main lesson	Engage	Connect	Explore
Defining what is a wetland?	8				
Mystery Box	9				
What animals are in a wetland?	10				
Wetland habitats	11				
Animals and their lifespan	12				
Impact of humans on habitat	13				

 Hands-on activity

 Pen and paper

 ICT

LESSON 1:
DEFINING "WHAT IS A WETLAND?"

Materials

- ☐ Smart Board
- ☐ Poster paper
- ☐ Work books
- ☐ Pens
- ☐ YouTube
- ☐ Worksheet - for Year 5-6

Introduction

Watch *Magic School Bus: Get swamped!*
www.youtube.com/watch?v=DUzpD6AR4js

To begin the lesson, students will watch sections of the *Get Swamped* episode that focuses on all the elements of a wetland by looking at swamps.

Students are to have a workbook and write down a list of things they see and think a wetland is.

Main Activity

Students will display their understanding as a group by creating a poster that explores "what a wetland is and what lives within the habitat?" The poster will include:

- Definition (Given by teacher)
- What animals did they see?
- What did it look like?
- What plants were in the swamp?

This allows students to demonstrate their understanding of what a swamp is and be able to display it on a poster that they can add to as the unit goes on.

Adaptations

Foundation - Year 2
Teacher is able to pause the episode throughout to ask students what they see during the episode- adding to the poster as they go.

Year 3-4
Students are to work in pairs and write down what they see to then add to the poster after the episode.

Year 5-6
Students are to write as they go independently and also complete a "Response Sheet" in reflection to the episode. (Which will be attached to the lesson outline)

Reference

The Magic School Bus Episode 44 Gets Swamped Wetlands (2018)
Retrieved from www.youtube.com/watch?v=1aFJXVujOrM (Run time 18 min approx)

LESSON 2:
MYSTERY BOX

Materials

For mystery box:

- ☐ Grass
- ☐ Rubber frogs/insects
- ☐ Jar of mud
- ☐ Water
- ☐ Plastic plants
- ☐ Slime
- ☐ Bark
- ☐ Rocks
- ☐ Sand
- ☐ Blind-fold

Other Materials:

- ☐ Worksheet
- ☐ Poster from previous lesson
- ☐ Pens
- ☐ Whiteboard
- ☐ Smart board

Introduction

Recount from last lesson - Students are able to look at the poster they put together and refresh their memory.

Re-define "What is a Wetland?"

Ask students to outline what is part of the habitat of a wetland?

Main Activity

In this mystery box, students have the opportunity to put a blindfold on and explore what is inside the box. The box will have materials listed above to help students imagine what the habitat feels like when they are at different wetlands- feeling for animals, surfaces and liquids that they will witness when being at a particular wetland.

Students are to volunteer and come up one at a time to select a material from the mystery box. Students are to touch, smell and describe what they think it may be. Students are allowed to get assistance from others if required.

At the end of the activity, ask students to review the objects they felt in the bag. Were they animals? Were they plants?

Ask students where they think these materials may be found at a real wetland? Have they seen them before? Where else have they seen them?

Adaptations

Foundation - Year 1

Students are not required to wear a blindfold and are to grab an item and identify it and why you would see it at a wetland.

Year 2-6

Students are all required to complete the activity above.

If the activity is completed quickly, students are then to use their workbooks and complete a reflection on the lesson. What they learnt, found interesting and what to learn more about.

LESSON 3:
WHAT ANIMALS ARE IN THE WETLANDS?

Materials

- ☐ The handout
- ☐ Pencils
- ☐ Markers

Introduction

For this lesson print off the sheet and organise a trip to a local wetland.

> **If you can't go to the wetland present the animals on the handout to the class.**

Students are to go on a "treasure hunt" using the sheet provided.

Once a students have seen a animals on the list they cross it off.

They need to find as many as they can while walking around the wetland.

Main Activity

Once the students are back in the classroom the students are to complete the task below:

Foundation - Year 2
Draw pictures of their favourite animal they saw at the wetland.

Year 3-4
Create a "memory" game using the animals found at the wetland.

Year 5-6
Create an information report on one of the animals at the wetland.

LESSON 4:
WETLAND HABITAT

Materials

- ☐ Glue
- ☐ Paper
- ☐ Scissors
- ☐ Cardboard boxes
- ☐ Coloured pencils
- ☐ Sticky tape
- ☐ Masking tape
- ☐ Sharpeners

Introduction

Continuing on from the previous class, the students are to create an animals (the one they chose last week) habitat.

Students are to use some plants and leaves and other things they find around the yard to create a display of the animals habitat.

Main Activity

Foundation - Year 2
Draw the habitat of the animal (they chose) on an A3 piece of paper. The students are to use at least one plant material

Year 3-4
Create a type of display (can be 3D or 2D) but need to involve some of the habitat they found in the mystery box that relates to their animal they choose in lesson 3.

Year 5-6
Create a full 3D display while using all habitat they found in the mystery box that relates to their animal they choose in lesson 3. They also need to make the animal they choose in lesson 3 to add the display

LESSON 5:
ANIMALS AND THEIR LIFE SPANS

Materials

- ☐ Modelling Clay
- ☐ Examples of animals found in the wetlands

Introduction

Engage in a short conversation about the different animals the students know live in the wetlands.

Write down the different animals that the students say on the whiteboard so they have a few options of what to complete this task on.

Main Activity

Hand out some modelling clay to the students.

Explain to the students that they are to choose an animal that lives in the wetlands and using the modelling clay make the stages of the chosen animals life span.

After this is completed the students share with the rest of the class what they have made and why.

Adaptations

Foundation - Year 4
Younger years will only need to do one or two staged of a life span, as they will need more time to complete this activity.

When the activity is completed the younger years will tell the class what animal they chose and what stage/s they decided to make.

Middle years will work by themselves, lower primary years will work in partners.

Year 5-6
The older years are to take a picture of the work they have completed and write a paragraph on it, explaining what animal it is and what is the lifespan of it, as well as sharing why they chose that certain animal.

LESSON 6:
IMPACT OF HUMANS ON HABITAT

Materials

- ☐ Plastic bottle
- ☐ Charcoal (washed)
- ☐ Sand
- ☐ Dirty water
- ☐ Glass for the clean water
- ☐ Tissue paper

Introduction

Engage in a short discussion about why it is important to have tadpoles in our wetlands.

Explain to the students how tadpoles filter our water so we can drink it.

Watch this YouTube link with the students:
https://www.youtube.com/watch?v=elPJbVv56wA

Have a final short discussion with the students about how they are going to filter their own water so they can understand what tadpoles do.

Main Activity

Students will make what they saw in the youtube clip.

After all students are completed they are to test their projects out in front of the whole class.

Have a discussion at the end of the class asking students if they would like to do this every time before they have a drink. Get students to understand the importance of tadpoles and our wetlands.

Adaptations

Foundation - Year 3
Students will work in groups of two or three

Year 4-6
Students will work by themselves.

Students will explain to the class why they think it worked and what was the hardest part about it.

Reference

Australia. (2016). Quick solution to purify and filter dirty water in less than 2 mins. Retrieved from https://www.youtube.com/watch?v=elPJbVv56wA (Run time 2.5 min approx)

REFERENCES AND BIBLIOGRAPHY

Community Environment Network. (2018). *Cen.org.au.* Retrieved 18 April 2018, from https://www.cen.org.au/wetlands/images/factSheets/wetlandAnimals.pdf

Great Cormorant, *Birds in Backyards.* Retrieved 11 May 2018, from http://www.birdsinbackyards.net/species/Phalacrocorax-carbo

http://www.carterdigital.com.au, C. (2018). Australasian Grebe | BirdLife Australia. Retrieved 11 May 29018, from http://www.birdlife.org.au/bird-profile/australasian-grebe

Mitsch, W., & Gosselink, J. (2000). *Wetlands* (3rd ed.). Canada: John Wiley & Sons, Inc.

Moore, P. (2006). *Wetlands*. New York: Biomes of the Earth.

River Detectives. (2018). *Riverdetectives.net.au.* Retrieved 18 April 2018, from https://www.riverdetectives.net.au

Russo, R. (2008). *Wetlands: Ecology, conservation and restoration.* New York: Nova Science Publishers.

Sharon, S., & Karen, M. (2004). *Wetlands*. Maryland, United States of America: Exploring Environment Challenges.

ADDITIONAL RESOURCES AND ORGANISATIONS

River Detectives
https://www.riverdetectives.net.au

Water Watch
http://www.vic.waterwatch.org.au

Melbourne Water
https://www.melbournewater.com.au

Western Gippsland Catchment Authority
http://www.wgcma.vic.gov.au

East Gippsland Catchment Management Authority
www.egcma.com.au

Victorian Waterway Management Strategy
http://www.depi.vic.gov.au/water/rivers-estuaries-and- wetlands/strategy-and-planning

Sustainability Victoria
http://www.sustainability.vic.gov.au/School/Modules/Biodiversity-module

School Environmental Education Directory
http://seed.vic.gov.au/

Australian Government Department of the Environment and Energy
http://environment.gov.au/water/wetlands/publications/discovering-wetlands-australia

APPENDICES

Name _____

MAGIC SCHOOL BUS: RESPONSE SHEET

Name 6 living things that were found at the Swamp.

1. _____ 4. _____

2. _____ 5. _____

3. _____ 6. _____

Keeping the swamp was a good idea; describe 3 ways that swamps are useful.

1. _____

2. _____

3. _____

What caused the flood?

_____

AUSTRALIAN WETLAND BIRDS

Great Crested Grebe

Description

The Great Crested Grebe is a medium to large aquatic bird, and is the largest of the grebes. It has a long neck and head with a distinctive black double crest.

The Great Crested Grebe has dark brown wings, satin white underparts, a black crown, dark olive-green feet and, during flight, prominent white patches are visible on its wings.

This grebe has a white face with a red eye, and a black line from the base of the bill to the eye.

Habitat

The Great Crested Grebe has been recorded in all Australian states and territories. It is found in coastal Queensland, throughout New South Wales, coastal South Australia, coastal and south-west Western Australia, and the Northern Territory.

This species is distributed throughout Europe, Africa and Asia to Australasia, but not New Guinea

Pelican

Description

There are seven species of pelicans in the world, all of which are similar in shape and, with one exception, are primarily white in colour.

Males are larger than females.

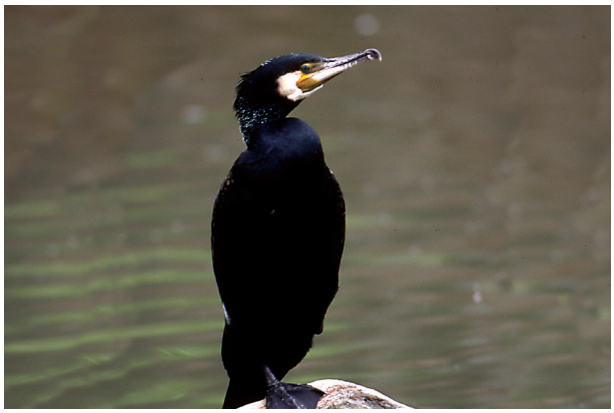
The most characteristic feature of pelicans is the elongated bill with its massive throat pouch.

The Australian Pelican's bill is 40-50 cm long and is larger in males than females.

Pelicans have large wings and a wingspan of 2.3-2.5 m.

Habitat

Pelicans are widespread on freshwater, estuarine and marine wetlands and waterways including lakes, swamps, rivers, coastal islands and shores.



Cormorant

Description

Great Cormorants are probably the most widespread member of the cormorant family with a range that includes North America, Europe, Africa, China, India, Southeast Asia, New Zealand, Papua New Guinea and Australia

The Great Cormorant is almost entirely black in plumage, apart from a white and yellow chin and a small white patch on each thigh (absent in winter).

The bill is grey and the legs and feet are black. Young birds resemble the adults but are more dusky-brown.

Habitat

In spite of its preference for extensive areas of permanent freshwater, the Great Cormorant is not confined to these and is often observed on coastal inlets and estuaries.

Ibis

Description

The Australian White Ibis is identified by its almost entirely white body plumage and black head and neck.

The head is featherless and its black bill is long and down-curved.

During the breeding season the small patch of skin on the under-surface of the wing changes from dull pink to dark scarlet.

Adult birds have a tuft of cream plumes on the base of the neck.

Females differ from males by being slightly smaller, with shorter bills.

Young birds are similar to adults, but have the neck covered with black feathers.

Habitat

The Australian White Ibis is common and widespread in northern and eastern Australia, and both its range and abundance in Western Australia is expanding, despite its absence from Western Australia prior to the 1950s. The species is absent from Tasmania.

Heron

Description

The White-faced Heron is mostly light blue-grey in colour, with a characteristic white face.

In flight, the dark flight feathers of the wing contrast with the paler grey plumage, making this bird easily identifiable when viewed from below.

It has a long, slim neck and a pointed grey-black bill. The legs are long and dull yellow in colour.

Habitat

White-faced Herons can be found anywhere where there is water, from tidal mudflats and coastal reefs to moist grasslands and gardens.

Pacific Black Duck

Description

The Pacific Black Duck is mostly mid-brown in colour, with each feather edged buff.

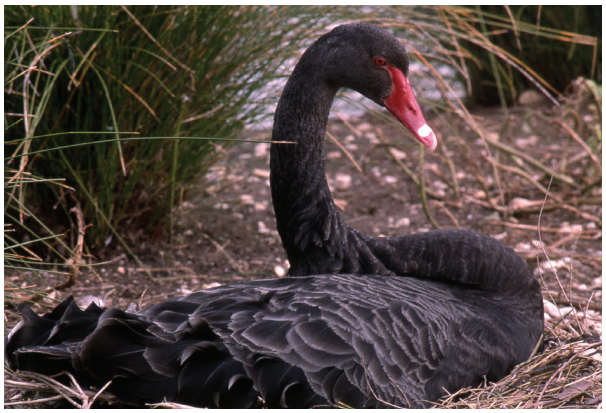
The head pattern is characteristic, with a dark brown line through the eye, bordered with cream above and below and a dark brown crown.

The upper wing colour is the same as the back, with a bright glossy green patch in the secondary flight feathers.

Habitat

The Pacific Black Duck is one of the most versatile of the Australian ducks.

It frequents all types of water, from isolated forest pools to tidal mudflats



Black Swan

Description

In adult Black Swans the body is mostly black, with the exception of the broad white wing tips which are visible in flight.

The bill is a deep orange-red, paler at the tip, with a distinct narrow white band towards the end.

Younger birds are much greyer in colour, and have black wing tips. Adult females are smaller than the males.

Habitat

Black Swans are found throughout Australia with the exception of Cape York Peninsula, and are more common in the south.

The Black Swan has been introduced into several countries, including New Zealand, where it is now common, and is a vagrant to New Guinea.

Silver Gull

Description

The Silver Gull has a white head, tail and underparts, with a light grey back and black-tipped wings.

In adult birds the bill, legs and eye-ring are bright orange-red.

Habitat

The Silver Gull is found at virtually any watered habitat and is rarely seen far from land.

Birds flock in high numbers around fishing boats as these leave or return to the coast, but seldom venture far out to sea.

Wood Duck

Description

The Australian Wood Duck is a medium-sized 'goose-like' duck with a dark brown head and a pale grey body with two black stripes along the back.

Males have the darker head and a small dark mane, with a speckled brown-grey breast and a black lower belly and undertail.

The females have a paler head with two white stripes, above and below the eye, a speckled breast and flanks, with a white lower belly and undertail.

In flight, the wings are pale grey above, contrasting with black wingtips, and have a noticeable white bar on the underside (the secondaries.

Habitat

The Australian Wood Duck is found in grasslands, open woodlands, wetlands, flooded pastures and along the coast in inlets and bays.

It is also common on farmland with dams, as well as around rice fields, sewage ponds and in urban parks.

It will often be found around deeper lakes that may be unsuitable for other waterbirds' foraging, as it prefers to forage on land.

Eurasian Coot

Description

The Eurasian Coot is recognised by its snowy white bill and forehead shield.

The remainder of the bird is dark sooty grey, except for its bright red eye.

Immature birds are generally paler than adults with a white wash on the throat.

Nestlings are downy, black with fine yellow tips. The head is orange-red and the bill is red with a cream-white tip.

Habitat

In Australia the Eurasian Coot is common in suitably vegetated lagoons and swamps. Birds are less common in the north and in the drier regions.