Unit Three – Finding the Glossy Black

Unit Lesson Overview
Years 8-9 (or groups undertaking a field trip)

Reference and copyright information
This resource was developed by the Glossy Black Conservancy and SEQ Catchments Ltd, 2008 with funding from the Australian Government.

ISBN 978-0-9805530-3-1
Brisbane
Resource drafting by EnviroCom Australia®

Introduction

The Glossy Black Conservancy is committed to the protection of the Glossy Black-Cockatoo across Australia. In Queensland, the Glossy Black-Cockatoo is a threatened species (listed in the *Nature Conservation Act 1992* as vulnerable) and is under pressure from development, habitat destruction and habitat fragmentation.

The Glossy Black-Cockatoo is a highly specialised bird, with a limited number of specific food sources, particular nesting requirements and a slow reproductive rate. Consequently it is highly susceptible to natural disasters and the pressures of urbanisation and development.

The Glossy Black Conservancy educates the community about the plight of this very special bird. In addition the Conservancy collects information on bird movements and numbers, as well as specific sites used by the Glossy Black-Cockatoo to feed, roost or drink. The Conservancy are asking the community to contribute to this data collection effort. More information on reporting Glossy Black-Cockatoos can be found at the Conservancy's website www.glossyblack.org.au.

The information collected is available to the public in a regular newsletter (also available from the website). It is also provided to planners and developers, in government and private industry, to raise awareness of the sites and resources used by the Glossy Black-Cockatoo.

This unit, one of four in a series of school education resources, focuses on undertaking a field trip to help students understand that the birds are very special and highly specialised.

The four educational units available are:

1. ***It's About the Birds (adaptations and structures)*** - lesson plans and activities targeting early primary, or learning outcomes by the end of Year Three.
2. ***Where Glossy Blacks live and feed (habitat and environments***) - lesson plans and activities targeting middle to late primary, or learning outcomes by the end of Year Five - Seven.
3. ***Finding the Glossy Black (a field study)*** - lesson plans and activities would target early secondary school, or learning outcomes by the end of Year Nine.
4. ***Managing and Protecting the Glossy Black (decisions and considerations for environmental management)*** - lesson plans and activities would target senior students, or learning outcomes by the end of Year Twelve.

Unit Three – Finding the Glossy Black (a field study)

Introduction

This unit is designed to facilitate a field study to observe Glossy Black-Cockatoo's, their habitats, their resources and other evidence of their use of an area.

Students will be engaged with the development of scientific keys, defining elements of a data collection process and interpreting this data to develop a field study report, highlighting the use or potential use of the field study area by Glossy Black-Cockatoos. Through this process students will gain a greater understanding of the specific and highly specialised life strategies utilised by these vulnerable birds.

Key Concepts

The key concepts considered in this unit of work include:

- Identification of Glossy Black-Cockatoos and their habits.
- Identifying various physical environments and habitats required for the survival of Glossy Black-Cockatoos.
- Identification of evidence of Glossy Black-Cockatoo activity.

Unit Overview

5 E's Phase	*Lesson*
Engage – to capture and discover	• Glossy Black-Cockatoo Habitats – where are they?
Explore – to have shared and/or hands on experiences	• Glossy Black Cockatoo PowerPoint presentation
Explain – to demonstrate what has been learnt in the exploring phase	• Glossy Black-Cockatoo - develop a field key • *Allocasuarina* - develop a field key • Cones and orts - develop a field key • Glossy Black-Cockatoo sightings - knowing what to look for
Elaborate – to build understanding, through additional investigation	• Field trip
Evaluate – to review and reflect on learning	• Field trip report

Linking Locally

Undertaking a field trip within the local area will allow students to be immersed in the local environment. To enhance the field trip it is recommended that authorities, such the Queensland Parks and Wildlife Service (QPWS), the local Council or local community and bird groups, be contacted so as to access any interpretive services or resources that may be offered in your region. These services may supplement the data collection within the unit of work by providing equipment and local area history. Liaising with such organisations will also demonstrate the range of community members employed or volunteering within the broad field of environmental protection.

To support the unit of work on Glossy Black-Cockatoos it is recommended that consideration be given to inviting a local Council Officer working in environmental planning to explain how consideration of the habitat of vulnerable species is handled in development applications.

Contacting local environment or bird groups to find people with specific information for Glossy Black-Cockatoos in your area.

Review the information on the Glossy Black Conservancy website (http://www.glossyblack.org.au/); the back issues of the newsletters identify recent or past sightings of Glossy Black-Cockatoos in your area. Contributing to this information source is also strongly encouraged.

The Queensland Museum offers a loan service for subscription schools. Information on this service can be found at http://www.qm.qld.gov.au/education/loans/loans_subscription.asp.

While the loan service does not currently include a Glossy Black-Cockatoo specimen, it does include a range of birds, eggs, nests and other habitat information that may enhance the teaching within this unit.

Taking Action

One aim of the Glossy Black Conservancy is to encourage community groups, including schools, to track Glossy Black-Cockatoo populations in the region. You can help this effort by reporting sightings of Glossy Black-Cockatoos or the location of their feed trees. The information will assist in protecting resources and habitat for the birds.

Glossy Black-Cockatoos are limited in their range by the availability of feed trees, nesting site and water sources. To assist the Glossy Black-Cockatoo, you can provide additional feeding sites by planting trees, establish safe water sources such as ponds and bird baths and protect roosting sites by not clearing all old and established trees (particularly those that contain hollows for nesting).

Essential Learnings

Essential Learnings for this unit

Knowledge and Understanding	Ways of Working
Key Learning Area (KLA) *SOSE*	
Students know and understand: ▪ Environments are defined by physical characteristics and processes, and are connected to human activities and decisions about resource management. ▪ Sustainability requires a balance between using, conserving and protecting environments, and involves decisions about how resources are used and managed. ▪ Distribution maps, climate zone maps and weather maps have specific features to convey information, including latitude, longitude, eight compass points, scale and distance, a legend and shading and/or symbols. ▪ Physical environments are defined by spatial patterns, including the arrangement of elements on the Earth's surface, the definable areas of the Earth's surface, the space between different locations, and absolute and relative location. ▪ Maps, including topographic, political and thematic maps, are developed with particular features, including scale, contour lines and human-created boundaries, and use the specific skills of observing, visualising, estimating, sketching and measuring.	**Students are able to:** ▪ Plan investigations using inquiry models ▪ Collect and analyse information and evidence from primary and secondary sources ▪ Evaluate sources of information and evidence for relevance, reliability, origins and perspective ▪ Draw conclusions and make decisions based on information and evidence by identifying patterns and connections ▪ Communicate descriptions, decisions and conclusions, using different text types for specific purposes and the conventions of research-based texts ▪ Respond to investigation findings and conclusions by planning and implementing actions
Key Learning Area (KLA) *Science*	
Students know and understand: ▪ Scientific knowledge can help to make natural, social and built environments sustainable, at a scale ranging from local to global. ▪ Immediate and long-term consequences of human activity can be predicted by considering past and present events. ▪ Systems of scientific classification can be applied to living things. ▪ Survival of organisms is dependent on their adaptation to their environment. ▪ Different feeding relationships exist within an ecosystem. ▪ In ecosystems, organisms interact with each other and their surroundings. ▪ All the information required for life is a result of genetic information being passed from parent to offspring. ▪ Changes in ecosystems have causes and consequences that may be predicted.	**Students are able to:** ▪ Plan investigations, including identifying conditions for a fair comparison, variables to be changed and variables to be measured ▪ Collect and analyse first- and second-hand data, information and evidence ▪ Evaluate information and evidence and identify and analyse errors in data ▪ Select and use scientific tools and technologies suited to the investigation ▪ Draw conclusions that summarise and explain patterns in data and are supported by experimental evidence and scientific concepts ▪ Communicate scientific ideas, data and evidence, using scientific terminology suited to the context and purpose

Lesson One: *Glossy Black habitats – where are they?*

Lesson Overview

Using the student's knowledge of the local area, bushland and other habitats that may support Glossy Black-Cockatoo populations will be identified and explored in the classroom.

Once they are identified, the specific requirements of the Glossy Black-Cockatoo will be developed as an overlay to define an area of focus for local field trips.

Lesson Objectives

Students should be able to:

- Define a habitat.
- Identify different habitats in their local area.
- Apply criteria of needs to the habitats in order to identify any potential Glossy Black-Cockatoo habitats in the local area.

Equipment

For the class:

- Copies of 'Refidex' or similar maps defining developed and bushland areas (such as parks).
- Access to electronic resources such as Google maps (optional).
- Access to aerial photography of the local area (optional).
- Access the EPA's remnant vegetation mapping http://www.epa.qld.gov.au/nature_conservation/biodiversity/regional_ecosystems/.

For each student:

- Writing materials

Preparation

- Review the term habitat with students.
- Obtain a sample she-oak stem with leaves and cones.
- Review PowerPoint presentations.

Lesson steps

1. Using the 'Refidex' or other mapping resources, students work in groups to identify local environments and different habitats, within a 10 km radius of the school.
2. Students apply labels to the habitats based on their local knowledge, including terms such as open, woodland, shrub areas, parklands, urban, acreage developments, wetlands and others.
3. Introduce the limiting habitat requirements of the Glossy Black-Cockatoo and ask the students to identify and highlight these on their maps. The limiting habitat requirements specific to Glossy Black-Cockatoos are:
    - Areas of she-oaks (*Casuarina* or *Allocasuarina* species), identified from their cones and segmented needle-like leaves.
    - Areas that contain older bushland, including sites with established large eucalypts, in dense communities; more likely to provide hollows for nesting.
    - Areas where water could be accessed; reminding students that Glossy Black-Cockatoos are very large (wingspans of 90cm) and need room around the edge of water sources to land.
4. Conclude by noting that all three of the overlay or limiting features must be present within 10km to have the potential to be Glossy Black-Cockatoo habitat.

Curriculum links

Mathematics: Space

Science: Life and Living

SOSE: Place and Space

Lesson Two: *Glossy Black-Cockatoo PowerPoint Presentation*

Lesson Overview

The Glossy Black-Cockatoo is a highly specialised bird that is under threat from habitat loss and other development pressures. The PowerPoint presentations summarise the most up to date scientific and descriptive information on the identification and habits of the Glossy Black-Cockatoo.

Lesson Objectives

Students should be able to:

- Identify a Glossy Black-Cockatoo.
- Identify the key ecological factors influencing the survival of the bird.
- Be aware of its degree of specialisation and need for assistance in its protection.

Equipment

For the class:

- The PowerPoint presentation
- Presenters notes - teaching

Preparation

- Review the presenter's notes prior to using the PowerPoint. There are two PowerPoint presentations and associated presenters notes that accompany this Education Kit. The degree of detail varies between versions and it is recommended that the selection of PowerPoint is based on the level of the student's previous knowledge and judged ability to comprehend.

- To assist students with organising their notes, the Right Angle Thinking Strategy can be used. See link below for explanation and BLM: http://www.cap.nsw.edu.au/QI/TOOLS/pqr/rightangle.htm

Lesson steps

1. Show Power Point and review with students.

Curriculum links

Science: Life and Living

Lesson Three: Glossy Black-Cockatoo – develop a field key

Lesson Overview

Students will develop a scientific key to enable accurate field identification of Glossy Black-Cockatoos in the field.

Lesson Objectives

Students should be able to:

- Create a simple scientific classification key to identify the Glossy Black-Cockatoo, particularly in relation to other Black-Cockatoos.
- Be able to compare features of the Glossy Black-Cockatoo with other birds.

Equipment

For the class:

- Completed Scientific Classification Key

For each student:

- Black Line Master (BLM): Scientific Classification Key

Preparation

- A collection of bird field guides may assist students in the development of the scientific key.
- A selection of scientific keys could be used to highlight the process of elimination that is the basis for the key.

Lesson steps

1. Explain and illustrate the concept of elimination used in the application of scientific key.
2. The following key features would be used to develop the key:
    a. Colour
    b. Size
    c. Beak shape
    d. Tail colour
    e. Head shapes

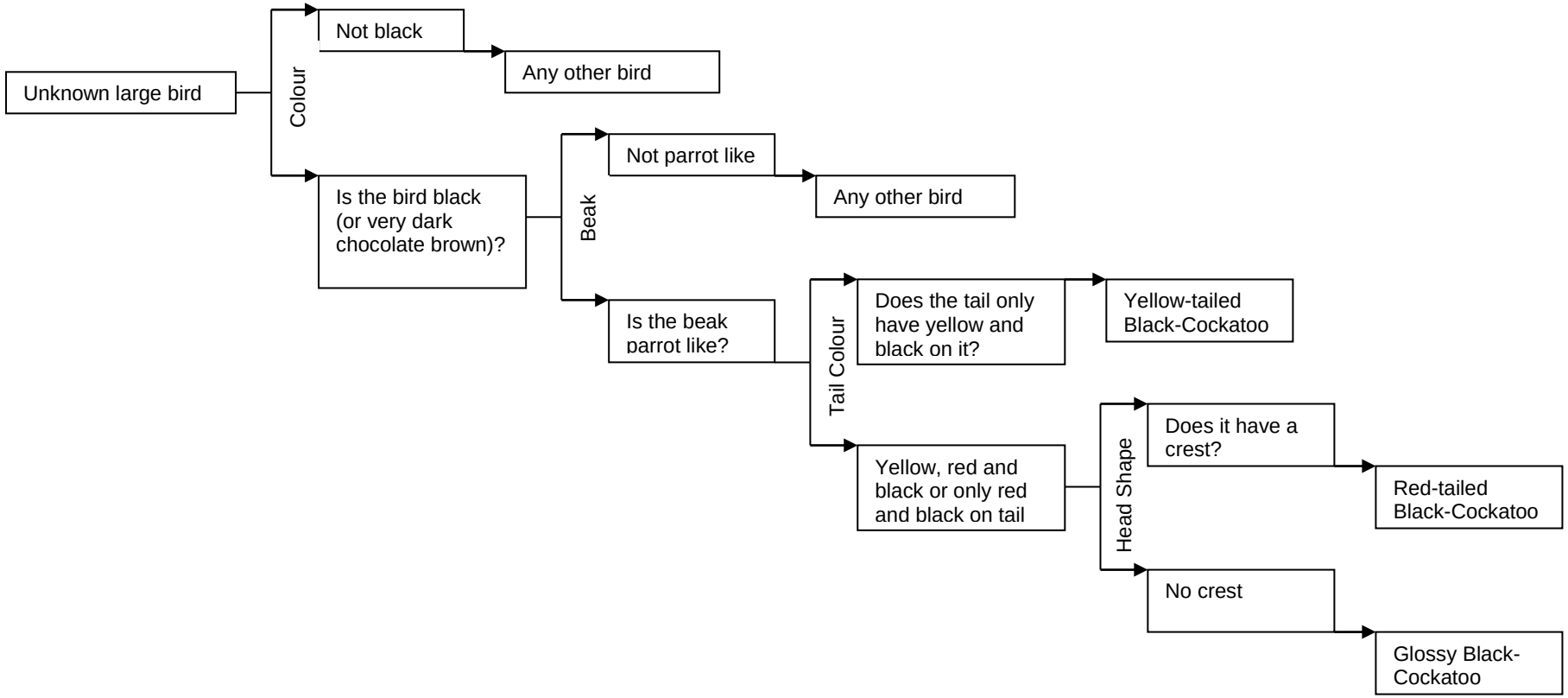
*NB: The Australian Museum has a “Birds – feather gallery” that may assist in further learning.

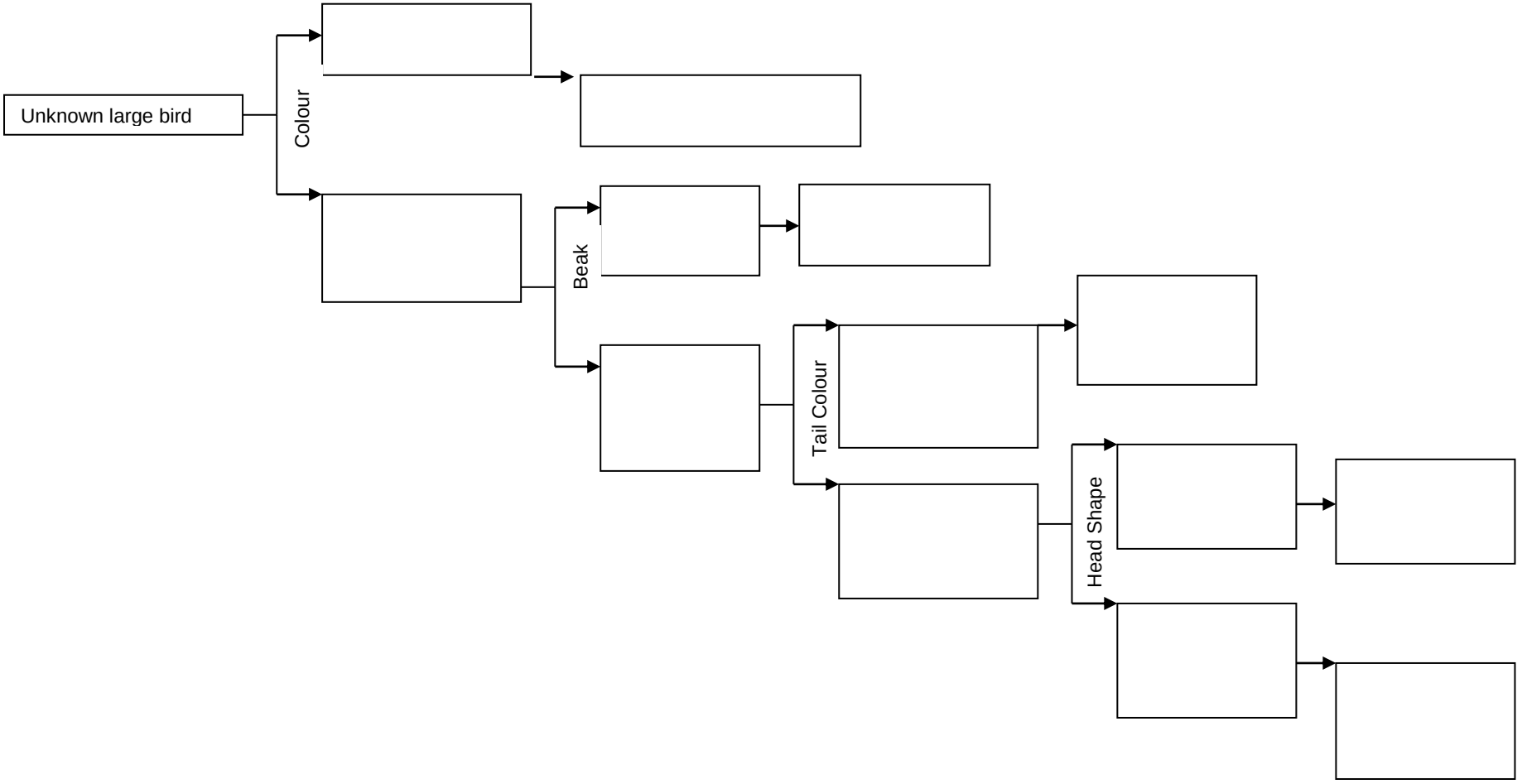
Curriculum links

Science: Life and Living

Glossy Black-Cockatoo **(*Calyptorhynchus lathami*)**	**Yellow-tailed Black-Cockatoo** **(*Calyptorhynchus funereus*)**	**Red-tailed Black-Cockatoo** **(*Calyptorhynchus banksii*)**
• Predominately chocolate brown • Coloured panels in the tail • Adult male: uniform chocolate head and neck, solid red tail panels • Females and juveniles: yellow patches and speckles around head and neck. Tail panels include red, yellow & black bars • Approx. 46 - 51cm Australia's smallest Black-Cockatoo	• Body darker (blacker) in colour • Distinct yellow disc over ear • Female: yellow around head and throat; yellow speckles on wings • Never have any red in tail panels • Approx. 55 - 60cm	• Darker in colour • Distinctive crest • Female: yellow speckles on wings and chest and around throat • Tail panels… • Approx. 50 - 64cm

Sample Scientific Classification Key for the Glossy Black-Cockatoo Species




Unknown large bird
Colour
Beak
Tail Colour
Head Shape

Lesson Four: *Allocasuarina – develop a field key*

Lesson Overview

Students will develop a scientific key to enable accurate field identification of *Allocasuarina* she-oaks.

Lesson Objectives

Students should be able to:

- Create a simple scientific classification key to identify *Allocasuarina* she-oaks from other trees and she-oaks.

For the class:

- Completed Scientific Classification Key
- Botanical guides for native Australian flora

For each student:

- BLM: Scientific Classification Key
- Recording sheet or booklet
- Digital camera

Preparation

- A selection of scientific keys could be used to highlight the process of elimination that is the basis for the key.
- A digital camera.

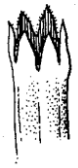
Lesson steps

For junior high school students:

1. Use the scientific classification key to identify the Allocasuarina tree. Collect samples of the branchlets from the tree/s and note the bark colour and texture and the form or habit of the tree.

2. Determine which species you are likely to have collected. The Black She-oak, (*Allocasuarina littoralis)* and the Forest She-oak (*Allocasuarina torulosa*) are the main food sources for Glossy Black-Cockatoos in South East Queensland. Similar she-oak species, include the Coastal She-oak (*Casuarina equisetifolia*), River She-oak (*C. cunninghamiana*), Belah (*C. cristata)* and Swamp She-oak (*C. glauca*). The number of teeth on the branchlet will provide a guide for identification of these species. Determine this by separating branchlet segments and recording the number of teeth.

Forest She-oak (*Allocasuarina torulosa*)



Black She-oak, (*Allocasuarina littoralis*)

Precise identification of species may need to be provided by a botanical expert, however, in the field you can also observe the habit of the trees to aid in identification.

3. Compare samples and record details; include sketches, photographs and notes on a recording sheet or in a booklet.

For senior high school students:

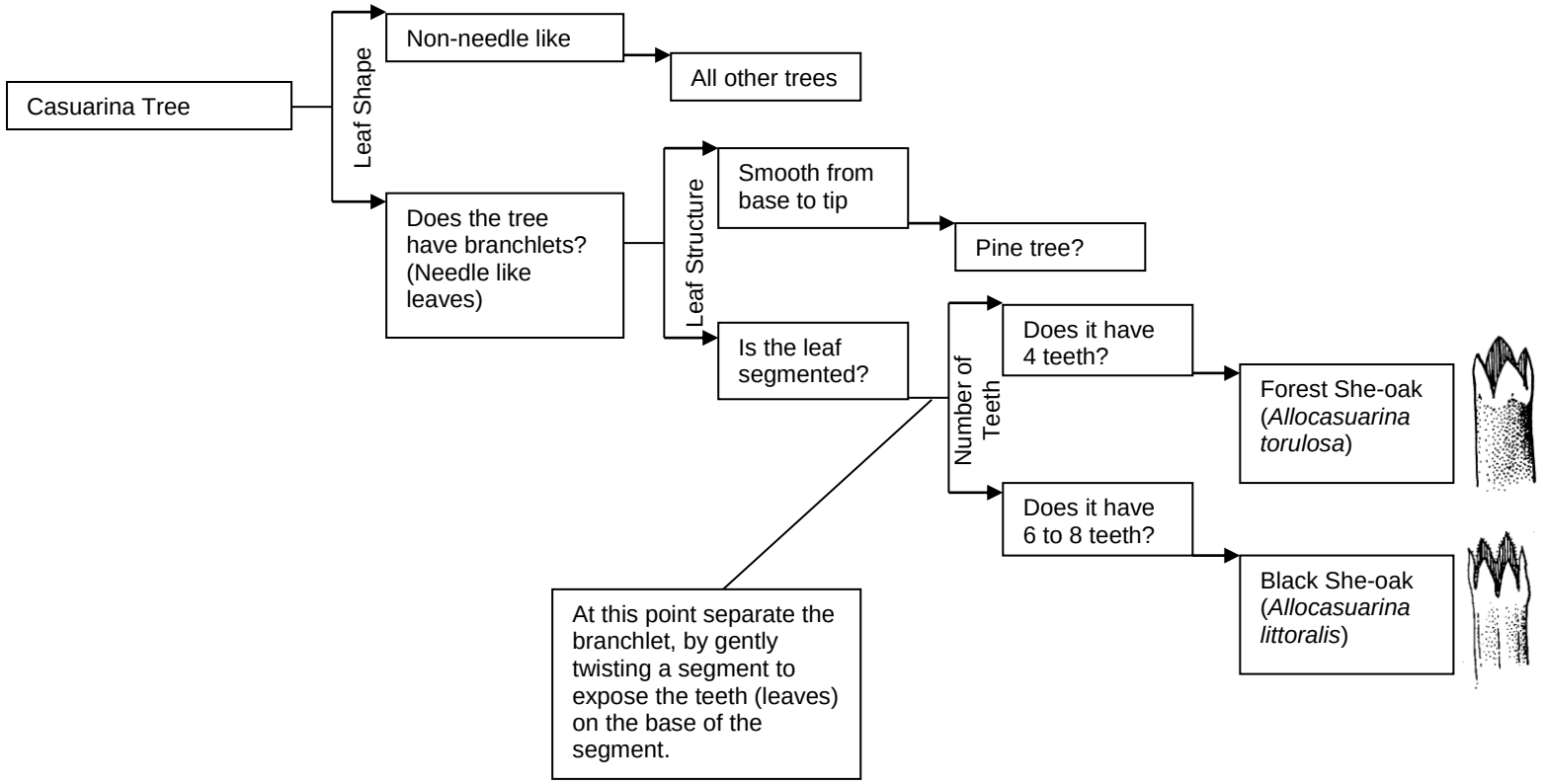
1. Discuss the key features for identifying the *Allocasuarina* tree/s.
2. Collect samples of its branchlets and examine the bark colour and texture and the form or habit of the tree. Record details; include sketches, photographs and notes on a recording sheet or in a booklet.
3. Provide an example of a scientific classification key. From the information gathered by the students they are to develop their own scientific classification key for identifying an *Allocasuarina* tree.

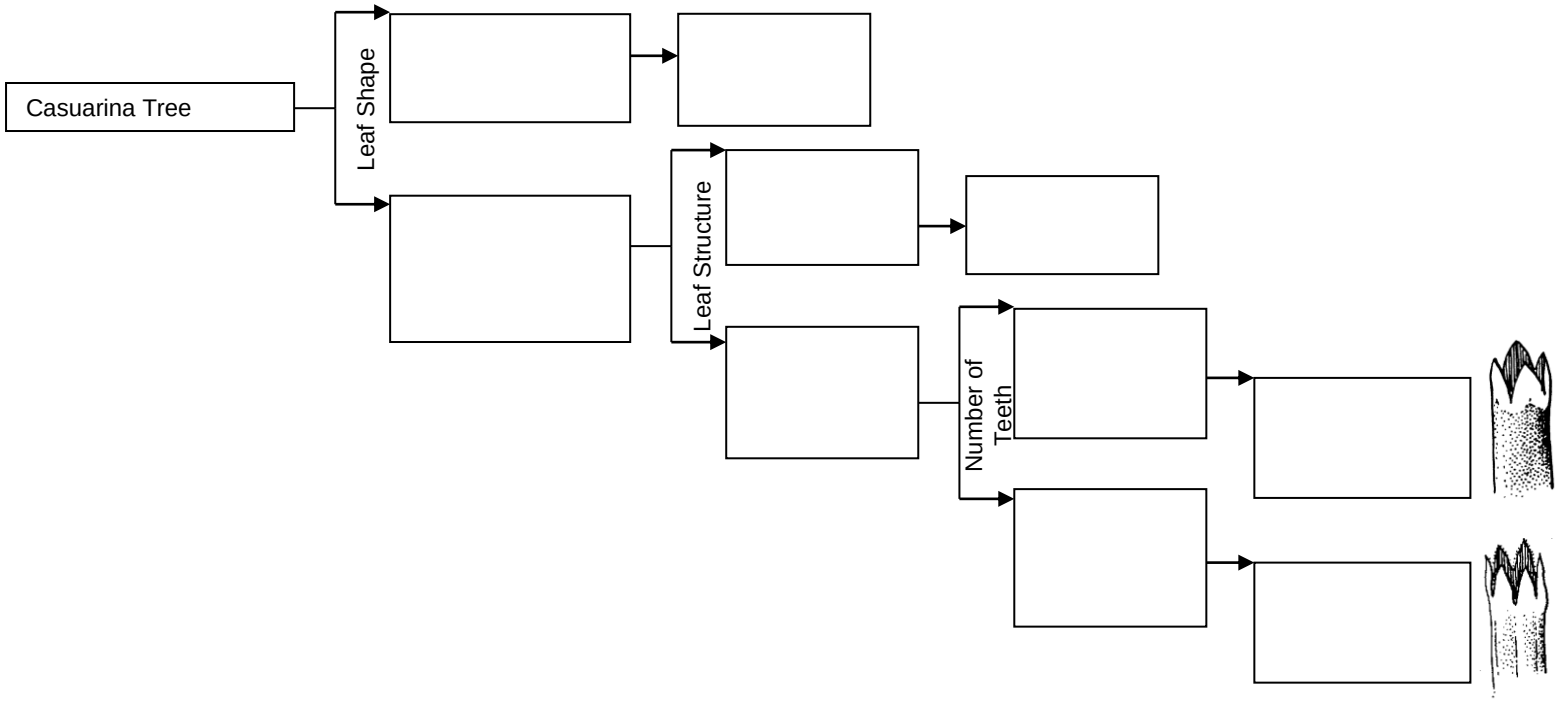
IDEA: Share resource development amongst grade levels. Senior high school students can provide junior students with their scientific keys to classify species.

Curriculum links

Science: Life and Living

Sample: Scientific Classification Key for the Allocasuarina Tree




Casuarina Tree
Leaf Shape
Leaf Structure
Number of Teeth

Lesson Five: *cones and orts – develop a field key*

Lesson Overview

Students will develop a scientific key to enable accurate field identification of feeding behaviours of the Glossy Black-Cockatoos.

Lesson Objectives

Students should be able to:

- Create a simple scientific classification key to identify the cones and orts (chewed cones) of an *Allocasuarina* tree. NB: The first part of the field key should include those steps which identify an *Allocasuarina* tree.

Equipment

For the class:

- Completed scientific classification key
- Digital camera
- Botanical guides for native Australian flora

For each student:

- BLM: Scientific classification key
- Recording sheets or booklets

Preparation

- A selection of scientific keys could be used to highlight the process of elimination that is the basis for the key.
- Organise a digital camera to record field study and samples.

Lesson steps

For junior high school students:

1. Use the scientific classification key to first identify the *Allocasuarina* tree. Collect samples of cones and orts from the tree/s.

2. Determine which species you are likely to have collected. The Black She-oak, (*Allocasuarina littoralis)* and the Forest She-oak (*Allocasuarina torulosa*) are the main food sources for Glossy Black-Cockatoos in South East Queensland. Similar she-oak species, include the Coastal She-oak (*Casuarina equisetifolia*), River She-oak (*C. cunninghamiana*), Belah (*C. cristata)* and Swamp She-oak (*C. glauca*). The number of teeth on the branchlet will provide a guide for identification of these species. Determine this by separating branchlet segments and recording the number of teeth.

Black She-oak, (*Allocasuarina littoralis*)

Forest She-oak (*Allocasuarina torulosa*)

Precise identification of species may need to be provided by a botanical expert, however, in the field you can also observe the habit of the trees to aid in identification.

3. Compare samples and record details; include sketches, photographs and notes on a recording sheet or in a booklet.

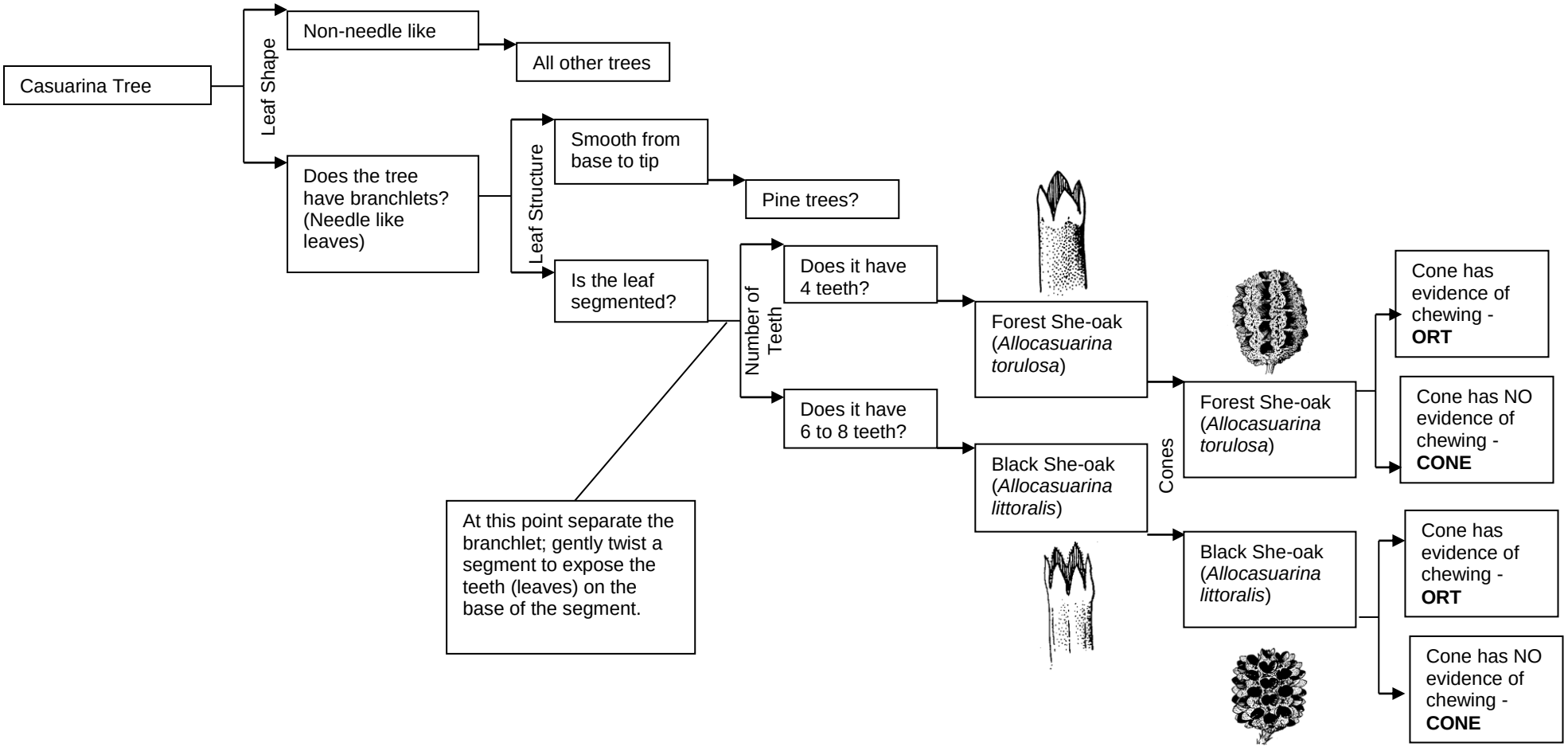
For senior high school students:

1. Discuss the key features for identifying the *Allocasuarina* tree/s.
2. Collect samples of its cones and orts. Record details; include sketches, photographs and notes on a recording sheet or in a booklet.
3. Provide an example of scientific classification key. From the information gathered by the students they are to develop their own scientific classification key for identifying an *Allocasuarina* cone or ort.

Curriculum link

Science: Life and Living

Sample Scientific Classification Key for the Cones of an Allocasuarina Tree



Casuarina Tree
Leaf Shape
Leaf Structure
Number of Teeth
Cones

Lesson Six: *Glossy Black sightings – knowing what to look for*

Lesson Overview

Using various sources, the students will develop an outline for their field trip.

Lesson Objectives

Students should be able to:

- Recall key points about the Glossy Black-Cockatoo and its habitat.
- Develop an outline for their field trip.

Equipment

For the class:

- Access to the library
- Access to a computer or the computer lab
- Copies of previous Glossy Black Conservancy newsletters: http://www.glossyblack.org.au/

Preparation

- Organise a time to visit the library and computer lab.
- An outline listing the criteria the students should investigate.
- Develop a ‘Hot List’.

Lesson steps

1. Brainstorm and record key points about the Glossy Black-Cockatoo and its habitat.
2. Discuss how this information can be organised and list any further key investigations that may be undertaken.
3. Using the ‘hot list’ students visit the library and/or computer lab to develop an outline for their field study. NB: Teacher may provide a prompt to guide the students’ investigations.

Curriculum links

SOSE: Place and Space

Lesson Seven: *Field trip*

Lesson Overview

Students will develop and utilise a range of data sheets to record information from the field trip. Data collection should not be limited to bird sightings, but include field transects, vegetation identification, collection of evidence of feeding, etc.

Lesson Objectives

Students should be able to:

- Collect and classify data from a primary data collection activity.

Equipment

For the class:

- First aid kit

For each student:

- Parent/guardian permission slips if excursion is off the school campus
- Standard risk assessment procedures prior and during trip as per Education Queensland guidelines

Preparation

- Check first aid kit is up to date.
- Send out and retrieve permission slips from parent/guardian if required.

Lesson steps

Consider these key points.

1. Primary data includes:
    - GPS location
    - date
    - number of Glossy Blacks sighted
    - samples including orts, cones and branchlets
    - transect of vegetation types (feed and roosting trees)
    - transect under trees noting cone/ort density
    - water sources
2. Additional data includes
    - other bird species sighted (heard)
    - other vegetation types (including comments on topographical locations and/or aspects where vegetation communities change)
    - weather (current and previous)
    - evidence of disturbance (e.g. recent land clearing, fire)
3. Secondary data includes
    - history of study area (including historical disturbances)
    - surrounding land use
    - historical Glossy Black-Cockatoo sightings

Curriculum links

SOSE: Place and Space

Science: Life and Living

Lesson Eight: *Field trip report*

Lesson Overview

Students are to develop a field report based on their field study notes.

Lesson Objectives

Students should be able to:

- Interpret and evaluate primary and secondary data.
- Collate scientific information in accessible forms.
- Use data to describe habitats and ecological events.

Equipment

For the class:

- Not required

For each student:

- Not required

Preparation

Undertake field trip and other secondary research to collate information to contribute to a field trip report.

Lesson steps

1. If data is to be provided to an external organisation (eg Glossy Black Conservancy) please note sighting times, specific locations, what was sighted etc and support with photographic records where possible.

2. Distribute reports to the Glossy Black Conservancy via the website and links - http://www.glossyblack.org.au/

Curriculum links

SOSE: Place and Space

Science: Life and Living