



LEARNING ABOUT
BUSH
STONE-
CURLAWS



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Acknowledgements: Jan Lubke and Judy Frankenberg from the Nature Conservation Working Group, Elisa Tack from Murray Local Land Services, Owen Dunlop from Petaurus Education Group Inc. and Val White.

This resource was funded by Nature Conservation Working Group and supported by Murray Local Land Services through funding from NSW Catchment Action.

Author: Peter Coleman, PeeKdesigns

Photographers: Jan Lubke, Chris Tzaros (front cover), Raoul Slater, Simon Dallinger, Kelly Coleman, Thomas Brown, Darren Marshall

Design: PeeKdesigns www.peekdesigns.com.au

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LEARNING ABOUT BUSH STONE- CURLEWS

by Peter Coleman



Local Land
Services
Murray





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INTRODUCTION FOR TEACHERS

Resource Background

The 'Learning about Bush Stone-curlews' resource has been developed to provide an opportunity for students to learn about an iconic Australian species - the Bush Stone-curlew. Education consultants PeeKdesigns have created this resource for the Nature Conservation Working Group (NCWG).

The Nature Conservation Working Group is a non-government, not-for-profit, environmental group that is comprised of like-minded landholders who have a desire to ensure the survival of the iconic Bush Stone-curlew.

Unit description

'Learning about Bush Stone-curlews' provides a comprehensive unit of work looking at a Bush Stone-curlew's:

- physical characteristics
- structural adaptations
- behavioural adaptations
- scientific classification
- habitat, diet and breeding
- conservation status, threats and recovery.

The resource is aimed at students between Years 3-7 and can be used either as a whole unit or as separate individual activities. Some information sheets and activities may also be appropriate for younger or older students.

Australian Curriculum

'Learning about Bush Stone-curlews' includes information sheets and activities for a range of abilities that may be suitable for any year level as determined by their teacher. To assist teachers, content description codes for the Science learning area in the Australian Curriculum have been provided.

Cross Curriculum Priorities: The unit information sheets and activities relate to the following Organising Ideas under the Australian Curriculum cross-curriculum priorities in Sustainability:

- OI.2 All life forms, including human life, are connected through ecosystems on which they depend for their well-being and survival.
- OI.9 Sustainable futures result from actions designed to preserve and/or restore the quality and uniqueness of environments.

General Capabilities: These have been identified in the following table where they are developed or applied in the content descriptions. These include Literacy, Numeracy, Information and Communication Technology Capability, Critical and Creative Thinking, Personal and Social Capability, Ethical Understanding and Inter-cultural Understanding.

LINKS TO THE CURRICULUM

INFORMATION SHEETS AND ACTIVITIES	DESCRIPTION	AUSTRALIAN CURRICULUM	GENERAL CAPABILITIES
<p>What are Bush Stone-curlews?</p> <p>Activity: Colouring the Curlew</p> <p>Pages 6-8</p>	<p>INFORMATION SHEET: Provides a basic introduction to the Bush Stone-curlew including physical characteristics, diet and habitat. (Includes NCWG video)</p> <p>ACTIVITY: Involves students research and studying physical features and adaptations to create their own Bush Stone-curlew poster</p>	<p>ACSSU044, ACSSU043</p> <p>Relevant to all year levels as an introduction</p>	<p>Literacy</p>
<p>Weir-loo</p> <p>Activity: Did you hear that?</p> <p>Pages 9-10</p>	<p>INFORMATION SHEET: Identifies Bush Stone-curlew's 'weir-loo' call as one of its most recognisable features and introduces their place in First Australian's culture.</p> <p>ACTIVITY: A whole class brainstorm involving students using their imagination to relate to Bush Stone-curlew's call. <i>Includes Interactive Sounds</i></p>	<p>ACSSU043</p>	<p>Literacy, Critical and Creative thinking, Inter-cultural Understanding, Cross-curriculum Priority Aboriginal and Torres Strait Islander Histories and Cultures OI.2</p>
<p>Activity: Grouping similar things</p> <p>Page 11</p>	<p>ACTIVITY: Students distinguish between living, non-living, once living and product of living things</p>	<p>ACSSU044</p>	
<p>Classification</p> <p>Activity: Find the key to the name</p> <p>Pages 12-13</p>	<p>INFORMATION SHEET: Looks at scientific name (taxonomy) of Bush Stone-curlew and why we have them. <i>Video support</i></p> <p>ACTIVITY: Uses a number of simple dichotomous keys to identify full scientific classification of the Bush Stone-curlew.</p>	<p>ACSSU111</p>	<p>Literacy</p>
<p>Activity: Making an Origami Curl</p> <p>Pages 14-15</p>	<p>ACTIVITY: A fun activity to create an origami Bush Stone-curlew. Challenges both dexterity and ability to follow instructions. <i>Video support</i></p>	<p>All year levels</p>	

INFORMATION SHEETS AND ACTIVITIES	DESCRIPTION	AUSTRALIAN CURRICULUM	GENERAL CAPABILITIES
Habitat Activity: Habitat Q and A Pages 16-18	<p>INFORMATION SHEET: Introduces survival needs of animals - includes video support. It then provides an in-depth look at the needs of the Bush Stone-curlew including habitat, behaviours, day roosts, foraging and nesting sites.</p> <p>ACTIVITY: Question and answer sheet to help student comprehension of habitat information sheets.</p>	ACSSU073, ACSSU094	Literacy
Maintaining a healthy diet Page 19	<p>INFORMATION SHEET: A more in depth look at diet and feeding behaviours of Bush Stone-curlew.</p>	ACSSU073	Literacy
Adaptations of the Bush Stone-curlew Activity: It's all in the design Pages 20-21	<p>INFORMATION SHEET: Focuses of the structural and behavioural adaptations of Bush Stone-curlew.</p> <p>ACTIVITY: Students take a closer at Bush Stone-curlew structural adaptation having long, gangly legs and big feet. They then use design skills to try and make their own version of Bush Stone-curlew leg and foot.</p>	ACSSU043	Literacy
The camouflage defence Activity: Where's Curl? Pages 22-24	<p>INFORMATION SHEET: Looks at structural adaptation of Bush Stone-curlew colour and use of camouflage. Focuses on behavioural adaptations that use camouflage as a defence and associated problems.</p> <p>ACTIVITY: Shows how even a cartoon Bush Stone-curlew image can camouflage into a messy woodland environment.</p>	ACSSU073, ACSSU043	Literacy
Breeding Activity: Create a life-cycle poster Pages 25-26	<p>INFORMATION SHEET: Further develops Bush Stone-curlew breeding details and behaviours. <i>Video support</i></p> <p>ACTIVITY: Provides a summary of breeding information and asks students to create their own Bush Stone-curlew life-cycle poster.</p>	ACSSU072	Literacy

INFORMATION SHEETS AND ACTIVITIES	DESCRIPTION	AUSTRALIAN CURRICULUM	GENERAL CAPABILITIES
Why are Bush Stone-curlews important? Page 27	INFORMATION SHEET: Uses Bush Stone-curlew to provide an introduction to 'biodiversity', why it is important and native species decline.	ACSSU073, ACSSU012 Relevant to all year levels	Literacy, Critical and Creative thinking, Ethical Understanding
Conservation Status Activity: Conservation criss-cross Pages 28-29	INFORMATION SHEET: Describes what is a threatened species, conservation status and levels of threat. ACTIVITY: Crossword designed to test comprehension of information sheet.	ACSSU073, ACSSU012	Literacy, Ethical Understanding
Threats and Conservation Activity: Escape the threats Pages 30-32	INFORMATION SHEET: Describes Bush Stone-curlew predators and the effects of loss of habitat, loss of food sources and recovery actions. ACTIVITY: A simple maze for students to navigate and avoid Bush Stone-curlew threats	ACSSU073, ACSSU012	Literacy, Ethical Understanding
Captive Breeding and Release Page 33	INFORMATION SHEET: Describes efforts by Nature Conservation Working Group (and others) to help Bush Stone-curlew population recover through breeding program.	ACSSU073, ACSSU012	Literacy, Ethical Understanding
Activity: Curlews at our place Pages 34-37	ACTIVITY: Uses a story and about a family discovering Bush Stone-curlew's on their property to summarise information taught throughout this unit of work. <i>Includes Interactive Sounds</i>	ACSSU044, ACSSU072, ACSSU073, ACSSU043, ACSSU011, ACSSU012	Literacy, Critical and Creative thinking, Ethical Understanding
Activity: Classroom mascot Page 38	ACTIVITY: Provides ideas on how to further celebrate the Bush Stone-curlew by adopting is as a class mascot.	Any year level	Literacy, Critical and Creative thinking, Ethical Understanding
Bush Stone-curlew Poem Page 39	INFORMATION SHEET: A Bush Stone-curlew poem kindly provided by Australian Poet, Hazel Hall.	Any year level	Literacy
Activity: Curl's Courageous Quest Pages 40-41	ACTIVITY: A fun way to end Bush Stone-curlew unit. Students guide Curl to safety and avoid Bush Stone-curlew threats.	Any year level	

WHAT ARE BUSH STONE-CURLEWS?

The Bush Stone-curlew (*Burhinus grallarius*) is a large bird, which has long, gangly legs. It is also called the Bush Thick-knee because of its large, thick knees. Standing between 50 and 60 cm tall, the Bush Stone-curlew has a short dark bill, large yellow eye, and mottled brown, white and grey plumage.



Although they can fly well, Bush Stone-curlews prefer to live on the ground. During the day they can be found hiding in woodland areas, roosting (resting/sleeping) amongst the fallen timber and leaf litter.

Bush Stone-curlews are nocturnal which means they usually feed at night. They eat large insects, spiders, snails, small reptiles, small mammals, frogs, small fruits and seeds. Being most active on moonlit nights, Bush Stone-curlews are more often heard than seen, with their haunting, eerie, wailing, 'weir-loo' call.

There are ten species of Stone-curlews globally, with the only other Stone-curlew in Australia being the Beach Stone-curlew. Stone-curlews are related to other wading birds such as stilts, avocets, oystercatchers, plovers and lapwings.

Watch this video for more information about Bush Stone-curlews: www.bushstonecurlew.com.au/videos

MEET CURL

This is Curl the Bush Stone-curlew.

Curl thinks he is the star of this resource and kept sneaking in. We tried and tried but just couldn't stop him.

We have embraced his cheekiness and made his appearance a game. Your job is to see if you can find Curl.



ACTIVITY: COLOURING THE CURLEW

Using resources in the library or on the Internet (or in this resource), look at a range of pictures of Bush Stone-curlews and decorate the image on the following page to make your own poster of a Bush Stone-curlew (this can be printed on A3 or A4 paper).

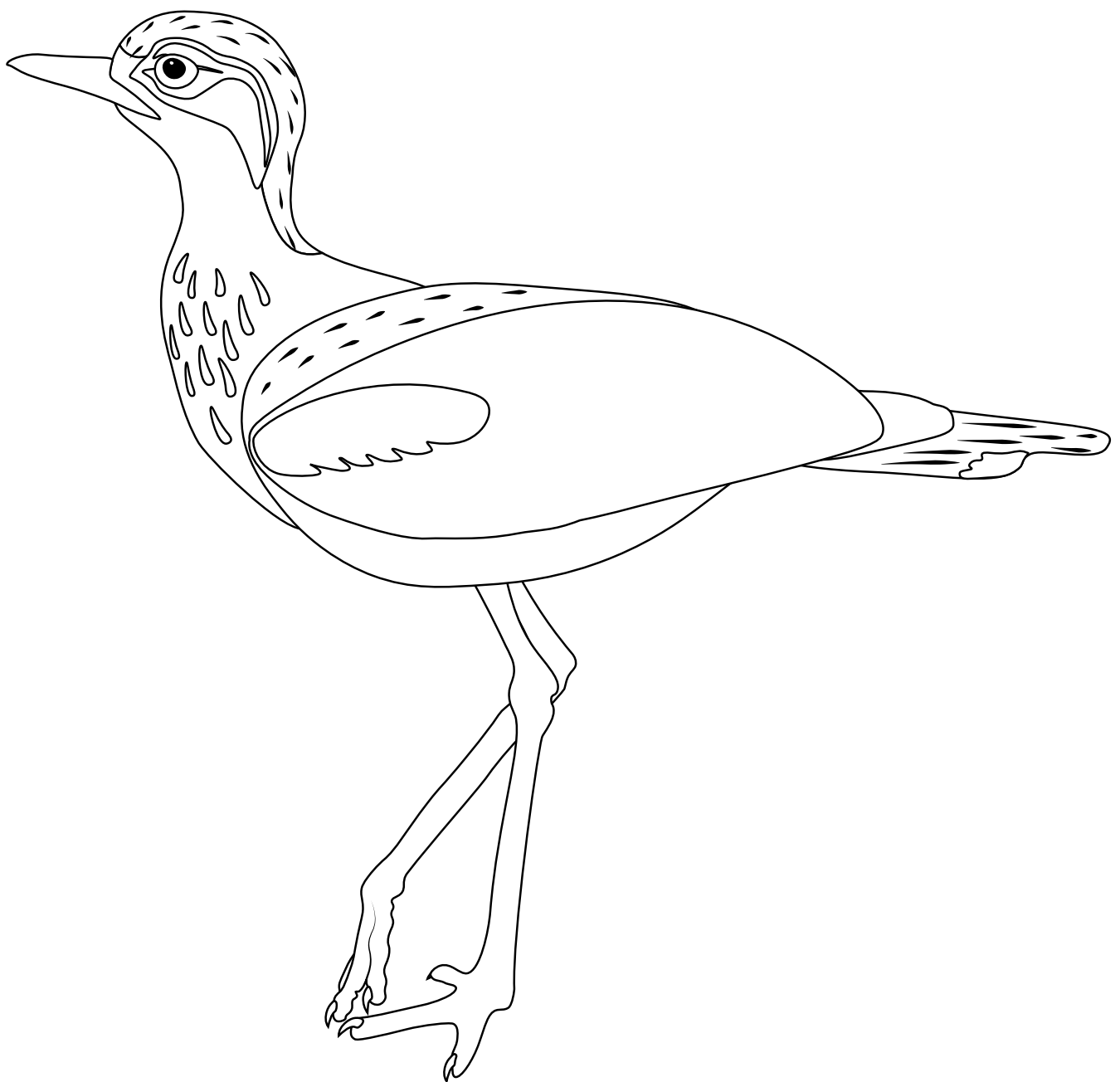
Using your own observations, or the descriptions below, label the identifying features of your picture.

Bush Stone-curlew descriptions

- Large thick knees
- Long gangly legs
- Large slim bird
- Height 60 cm
- Wingspan 80-100 cm
- Mostly grey-brown, streaked with black and rufous (reddish brown) streaks
- Whitish belly with vertical black streaks
- Large yellow eyes with a prominent whitish eyebrow
- Black/dark brown eye stripe leading down side of neck
- Black beak with whitish patch above and below on jaw and throat
- Long slightly webbed feet with three forward-facing toes.



Bush Stone-Curlew



WEIR-LOO

Bush Stone-curlews have many striking features. Perhaps one of their most recognisable features has nothing to do with how they look but rather how they sound. Most common at dusk or during the night, the Bush Stone-curlew's eerie call resonates through the landscapes they inhabit.

Their call ranges from a low, sad sounding ***weir-loo*** (wer-loo) to a high pitched, drawn out ***keeleoo***. Often described as haunting, especially at night, you may be more likely to hear a Bush Stone-curlew than see one.

Dreaming Stories

The ghost-like calls of Bush Stone-curlews have haunted landscapes around Australia for thousands of years. This melancholy (sad) sound has been likened to crying or weeping women/children and caused them to become part of our First Peoples culture in their Dreaming stories throughout the country. These Dreaming stories often refer to the Bush Stone-curlew as the messenger of death, crying for lost souls or the loss of something significant.



ARTWORK DESCRIPTION

This painting depicts one of many *jurlpu* (bird) species that live around Yuendumu, Northern Territory... A number of bird species tell people messages... The cries of birds, like the *kirrkalanji* (brown falcon) and *ngamirliri* (bush stone curlew), can make children sick.

SOURCE: <https://www.aboriginal-art-australia.com>

NICKNAMED THE 'SCREAMING WOMAN BIRD', THEIR HIGH-PITCHED, DRAWN-OUT SHRIEKS CAN BE HEARD ACROSS THE NIGHT AS THEY TRY TO CONTACT EACH OTHER.

- BEC CREW, AUSTRALIAN GEOGRAPHIC

THEIR SCREAMS ARE SO CHILLING THERE ARE STORIES OF PEOPLE CALLING THE POLICE TO REPORT HEARING THE SCREAMS OF A WOMAN.

- SOLUA MIDDLETON, ABC OPEN



ACTIVITY: DID YOU HEAR THAT?

TEACHER'S NOTES

The aim of this activity is to get your students to actively listen to a story. At the end of the story you will lead a class brainstorm where you ask students to describe what they think the call of the Bush Stone-curlew sounds like and how they felt when they heard it in the story.

1. Tell students it is their job to close their eyes, keep quiet and listen carefully to your voice.
2. Read the following story and play the sounds in the appropriate spots (you will need to play sounds via the PDF file that can be downloaded at www.bushstonecurlew.com.au/education).

Calls through the night

Imagine you are out camping in the bush. You have never been to this spot before and everything is very new to you. There are lots of tall trees around your camp and some sparse but scrubby undergrowth. Night falls and eventually your family and friends all go to bed in their tents.

After a while you find you have trouble sleeping and you decide to get up. As you leave your tent your senses start to take over. Although it is dark in the woodland around camp, the moonlight and dying fire cast shapes and shadows all around. Everything looks just a little bit strange and scary under the flickering light.

You can hear a breeze blowing through the trees and the slight crackle of the fire as it slowly dies. Everything else is completely silent. But wait - is there something moving out there? Did you hear something rustle in the leaf litter or is it your imagination? Is something or someone watching you or is it your mind playing games?

Then, all of a sudden you hear something...

As your body freezes you begin to wonder "WHAT ON EARTH WAS THAT?" when...

You run as quickly as you can to your tent and get back in your sleeping bag when...

Now focus on what that sound reminds you of and how does it make you feel?

3. Ask students to describe the sound in their own words and record all comments on the board.
4. Many people throughout history have described the call as eerie shrieks, wailing women or spirits. Look at the list of ideas on the board. Does this sound like what you have come up with?




ACTIVITY: GROUPING SIMILAR THINGS

To get a better understanding of something in science it is helpful to be able to group things together that have similarities. One of the first ways to group things is to identify whether something as living or non-living.

1. If a living thing is something that is able to breathe, eat, drink, move, grow and reproduce; then sort the following list into living and non-living things.

Tree	Bush Stone-curlew	Eagle	Grass	Koala	Paper	Feather
Glass Cup		Rock	Metal Ruler	Straw Hat	Car Tyre	Snake Skin
iPad	Wool Socks	Worm	Wooden Ruler	Fly	Cow Pat	Lamb Chop

LIVING	NON-LIVING
	

2. Are there any things on the list that you think were once living or a product of a living thing?

ONCE LIVING	PRODUCT OF A LIVING THING

CLASSIFICATION

The name Bush Stone-curlew is what is known as a **common name**. Another common name for the Bush Stone-curlew is the Bush Thick-knee. People in different areas can often have their own names for plants and animals that aren't very specific. Sometimes it can be hard to know exactly what species is being talked about.

Back in the 18th century, Carolus Linnaeus (a Swedish man) thought it was important to group together and organise living things. He developed a system that put living things in order - we call this **taxonomy**.

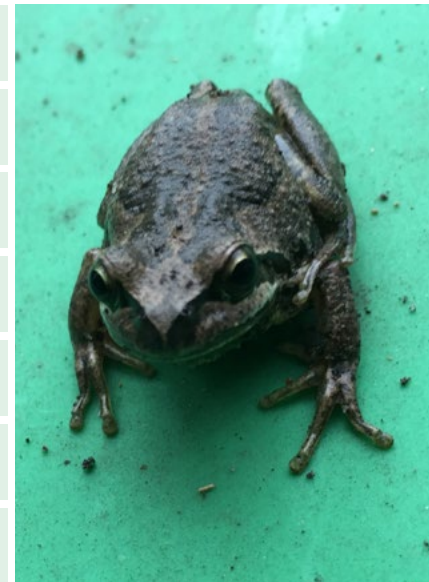
When we organise living things by classifying, or grouping, them together using the taxonomy system we use seven different levels.



K INGDOM
P HYLUM
C LASS
O RDER
F AMILY
G ENUS
S PECIES

An easy way to remember the different levels is with this Pneumonic saying...

K EEP
P ONDS
C LEAN
O R
F ROGS
G ET
S ICK



WATCH AND LEARN

To learn more about how taxonomy works, watch this easy to follow video.

<https://youtu.be/vqxomJIBGcY>

Naming the Bush Stone-curlew

The taxonomy system is how we get the **scientific name** for a species. The scientific name lets us know exactly what species is being talked about. No other species can have the same scientific name.

The scientific name is made from the **Genus** and **Species** classification levels.

The Bush Stone-curlew's scientific name is *Burhinus gallarius*.
 Genus = *Burhinus*
 Species = *gallarius*

Wherever you are around the world, if you talk about the '*Burhinus gallarius*' then scientists know you are referring to the Bush Stone-curlew and not another species, such as the Beach Stone-curlew.

PHOTO: C. TZAROS, K. COLEMAN

ACTIVITY: FIND THE KEY TO THE NAME

We know the scientific name for the Bush Stone-curlew is *Burhinus grallarius*. See if you can work out the full name using Linnaeus' taxonomy system. Use the keys below to decide the correct name for each classification level and record the full scientific classification of the Bush Stone-curlew in the table.

PLEASE NOTE THAT THE FULL TAXONOMY SYSTEM HAS FAR MORE BRANCHES AND DESCRIPTIONS FOR EACH LEVEL OF CLASSIFICATION.

KINGDOM	
PHYLUM	
CLASS	
ORDER	
FAMILY	
GENUS	
SPECIES	



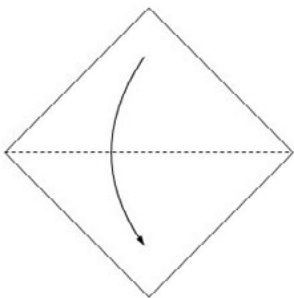
What's my name?

KINGDOM	<input type="checkbox"/> Fungi <input type="checkbox"/> Plantae (plant) <input type="checkbox"/> Animalia (animal)
PHYLUM	<input type="checkbox"/> Chordata (has backbone) <input type="checkbox"/> Mollusca (soft bodied) <input type="checkbox"/> Arthropoda (segmented body)
CLASS	<input type="checkbox"/> Mamalia (mammal) <input type="checkbox"/> Reptilia (reptile) <input type="checkbox"/> Aves (bird)
ORDER	<input type="checkbox"/> Anseriformes (webbed footed for swimming) <input type="checkbox"/> Falconiformes (raptors with sharp hooked beak and strong claws) <input type="checkbox"/> Charadriiformes (nests on the ground)
FAMILY	<input type="checkbox"/> Chionidae (sheathbills and Magellanic plover) <input type="checkbox"/> Burhinidae (stone-curlew) <input type="checkbox"/> Haematopodidae (oystercatchers)
GENUS	<i>Burhinus</i> Known from the scientific name (long legs, long wings and cryptic plumage)
SPECIES	<i>grallarius</i> Known from the scientific name (Bush Stone-curlew)

ACTIVITY: MAKING AN ORIGAMI CURL

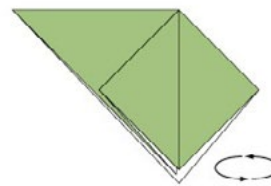
Origami is the art of paper folding. Follow these steps to make an Origami version of our mascot Curl. To help you out, follow the instructions in the video at <https://youtu.be/x2Kp9aCAM1Y>

SOURCE: <http://origamijapan.net/heron/>



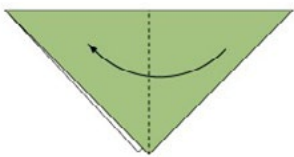
STEP 1

Fold the paper along the dotted line in the direction of the arrow.



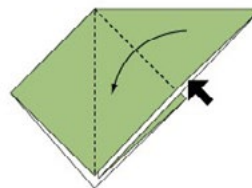
STEP 5

Turn over the paper.



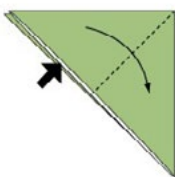
STEP 2

Fold the paper along the dotted line in the direction of the arrow.



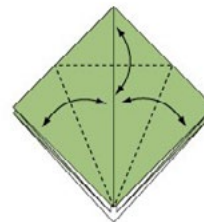
STEP 6

Open the paper as shown to create a small pocket. Then flatten down the sides of the pocket.



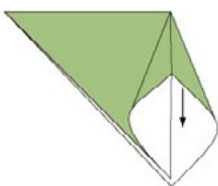
STEP 3

Open the paper as shown to create a small pocket. Then flatten down the sides of the pocket.



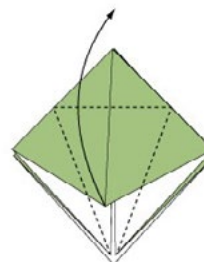
STEP 7

Fold and crease in the direction of the arrow.



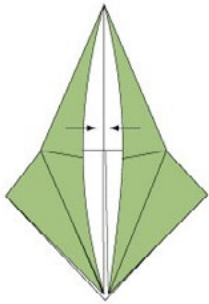
STEP 4

Continue from step 3.



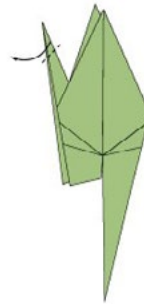
STEP 8

Open the paper as shown to create a small pocket. Then flatten down the sides of the pocket.



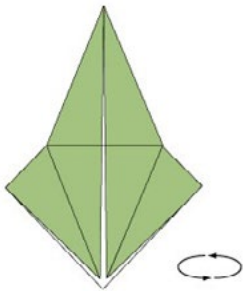
STEP 9

Continue from step 8.



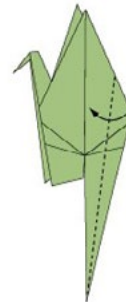
STEP 14

Fold the paper with the dotted line on the inside.



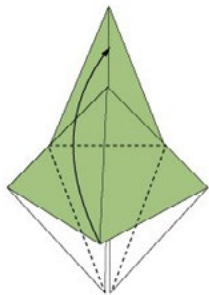
STEP 10

Turn over the paper.



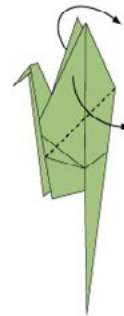
STEP 15

Fold the paper along the dotted line in the direction of the arrow. Fold the reverse side in the same manner.



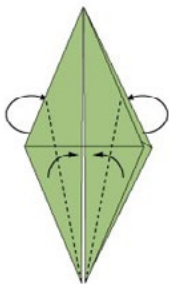
STEP 11

Open the paper as shown to create a small pocket. Then flatten down the sides of the pocket.



STEP 16

Fold the paper along the dotted line in the direction of the arrow. Fold the reverse side in the same manner.



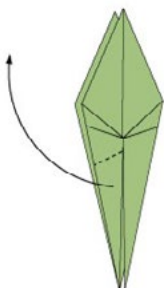
STEP 12

Fold the paper along the dotted line in the direction of the arrow. Fold the reverse side in the same manner.



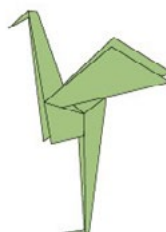
STEP 17

Fold the paper with the dotted line on the inside.



STEP 13

Fold the paper with the dotted line on the inside.



STEP 18

Complete.



HABITAT

What do animals need to survive?

All animals have certain things that they need to survive. Animals need:

OXYGEN to breathe

WATER to keep hydrated

FOOD for energy

SHELTER for protection



Watch (and sing along) to “The Needs of an Animal” <https://youtu.be/E1GTcvovh-A>

Habitat

Bush Stone-curlews must find all of these ‘survival needs’ within their habitat. Like an emu, they have three forward-facing toes and no back toe to perch on tree branches. This means that Bush Stone-curlews can only stand, feed, rest and nest on the ground.

They prefer habitat that consists of relatively undisturbed grassland and grassy woodlands, with a cover of leaf litter, fallen branches and tussock grasses. They need these ‘messy’ woodlands to provide them with cover that both protects them from the weather and allows them to hide from predators. These areas also provide habitat for their key food sources.

CURLY FACT

Habitat is the location or environment where a living thing is most likely to be found. Habitats contain the conditions, resources and community of plants and animals that a species relies on to survive.



Day roosts

During the day Bush Stone-curlews roost by standing, sometimes on one leg, or by sitting on the ground under the shelter of trees. A pair of Bush Stone-curlews will use three to five roosting areas within their territory. The best roost sites are found under stands of mature trees where leaf litter and logs have accumulated.

Healthy trees within the day roost will ensure that it is self-sustaining. Allowing a few saplings to grow ensures there will be mature trees for the day roosts in the future.

It is important that day roost sites have good visibility throughout the surrounding area so they can keep an eye out for predators. If one of the Bush Stone-curlews' day roost sites is disturbed or they feel threatened, they will move to one of their other sites.

“For an area or landscape to be suitable as habitat there needs to be several day roost sites within several hundred metres to approximately a kilometre of each other.” (Sleigh, Williams and Stothers, 2010)



Foraging sites

Bush Stone-curlews are nocturnal, which means they are mostly active at night. They use different areas of their range for different purposes. Around dusk they leave their day roost sites and head out to a preferred foraging site. These foraging sites can be up to one or two kilometres from their day roosts.

Foraging sites are usually in much more open areas like grasslands, paddocks or open woodland.

Nesting sites

Bush stone-curlews nest on the ground, so when selecting a nest site grass height and density are very important. When sitting on its nest the bird likes to be able to see over and through the grass for 50-150 metres in every direction so it can watch out for approaching predators.



ACTIVITY: HABITAT Q AND A

1. What are the four things that every animal needs to survive and why do they need these things?

.....

.....

.....

.....

2. In your own words describe what habitat is?

.....

.....

3. Do Bush Stone-curlews live mostly on the ground or in trees?

.....

4. Can they fly at all?

.....

5. Tick the picture below you think is the most suitable habitat for a Bush Stone-curlew? Why did you choose it?

.....

.....



6. Name the 3 types of sites that curlews use.

.....

.....

.....

7. Which sites are more likely to be in grasslands or open woodlands?

Grasslands	Open Woodlands

8. Which site is more likely to be in a stand of mature trees containing accumulated logs and leaf litter?

.....

9. How many day roosting sites might they have?

.....

10. Why do they like to see 50-100 metres in every direction at nesting sites?

.....

.....

11. Label the picture below with the type of site you think it is? (Day roost, foraging or nesting)



MAINTAINING A HEALTHY DIET

Question

From what you know about Bush Stone-curlews, where do they spend most of their time: flying and in the air or walking on the ground?

Answer

Although they can fly, Bush Stone-curlew's are mostly a ground dwelling bird - meaning they live their lives on the ground.

Bush Stone-curlews spend nearly all their time on the ground because this is where they find their food. Their long legs and long toes are perfect for foraging over wide areas and digging through the soft soil, leaf litter and rotting wood to find their food. They feed mostly at night and are especially active on bright moonlit nights.

They usually have a range of foraging sites in relatively open areas. Bush Stone-curlews cover quite a bit of territory when feeding - they can move up to two kilometres from their day roosts. During the breeding season they don't move quite as far, preferring to feed closer to their nesting sites. Strangely, Bush Stone-curlews are often solitary feeders and breeding pairs will split up and feed by themselves. (Sleigh, Williams and Stothers, 2010)

Bush stone-curlews are not picky eaters and are omnivores. They eat a wide range of foods that largely include whatever they can find. Their diet consists of insects, molluscs, centipedes, crustaceans, spiders, frogs, lizards, snakes, small rodents as well as some seeds, tubers and fruit.

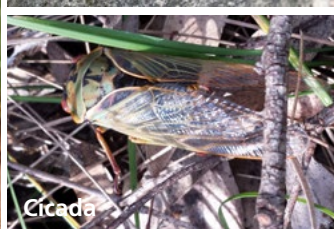
CURLY FACT

Foraging can be defined as "a wide search over an area in order to obtain something, especially food or provisions."



CURLY FACT

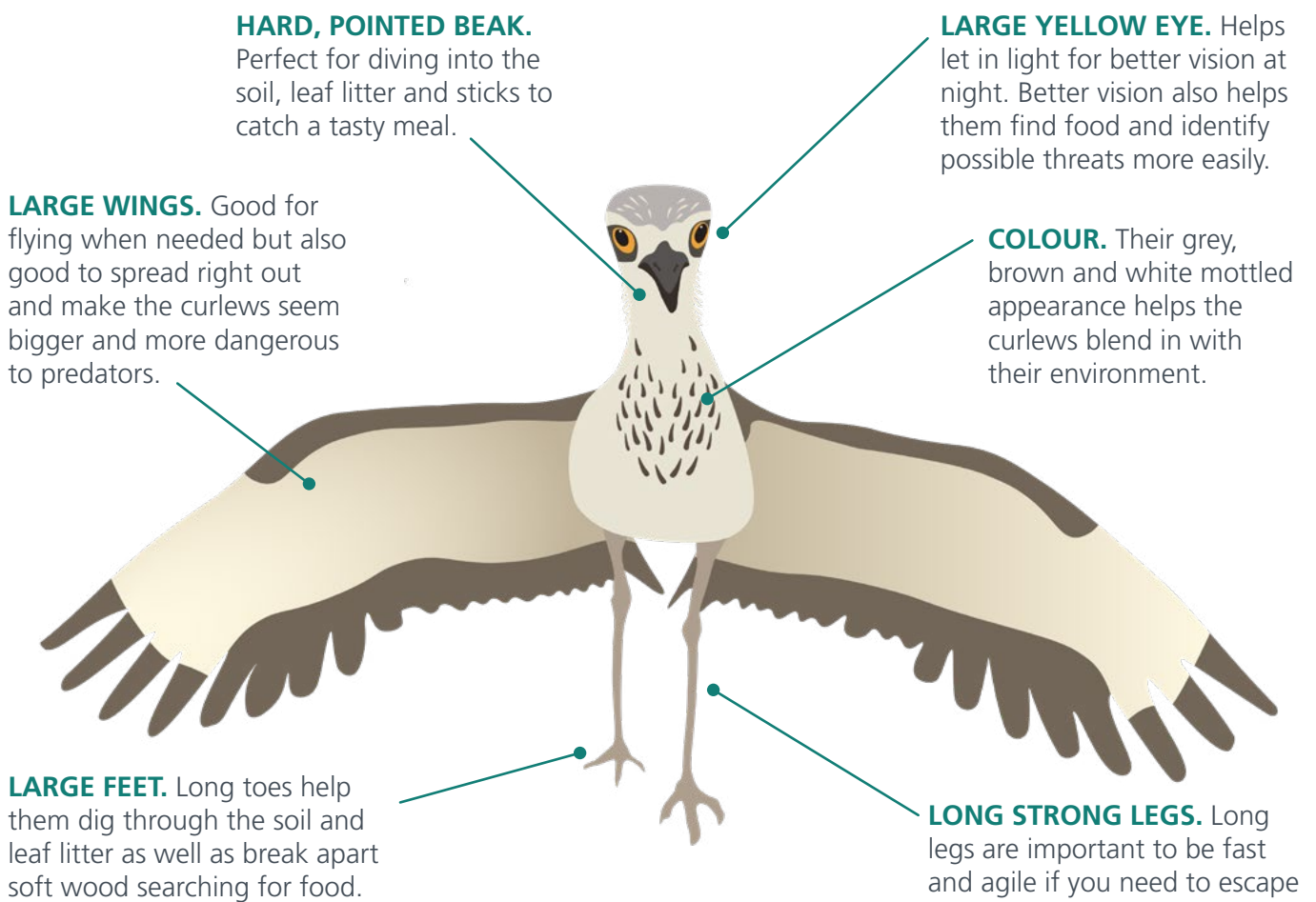
A **herbivore** is something that eats plants. A **carnivore** is something that eats other animals. An **omnivore** eats both plants and animals.



ADAPTATIONS OF THE BUSH STONE-CURLEW

An adaptation is something that a species has developed as it has evolved to give it the best chance of surviving in a certain environment. Adaptations can be structural (physical) or behavioural.

In other words: ***“things that an animal has developed to help them live.”***



HARD, POINTED BEAK. Perfect for diving into the soil, leaf litter and sticks to catch a tasty meal.

LARGE YELLOW EYE. Helps let in light for better vision at night. Better vision also helps them find food and identify possible threats more easily.

LARGE WINGS. Good for flying when needed but also good to spread right out and make the curlews seem bigger and more dangerous to predators.

COLOUR. Their grey, brown and white mottled appearance helps the curlews blend in with their environment.

LARGE FEET. Long toes help them dig through the soil and leaf litter as well as break apart soft wood searching for food.

LONG STRONG LEGS. Long legs are important to be fast and agile if you need to escape from predators. They also give the curlew extra height so it can see further to identify threats.

COURTSHIP DANCE. This behavioural adaptation is used to attract a mate. The better your “dance” the more chance you have of breeding and producing offspring.

WARNING DISPLAYS. A behavioural adaptation to try and scare off predators. When trying to scare away threats, bigger and louder is better. By stretching their wings right out a Bush Stone-curlew can seem lots bigger and more threatening. They make loud noises to intimidate their threats and make them think it may be not worth taking them on.

CALLS. This behavioural adaptation allows the Bush Stone-curlew to communicate. They have many different calls for talking to each other, trying to find a mate, warning each other of possible threats and trying to scare off predators.

ACTIVITY: IT'S ALL IN THE DESIGN

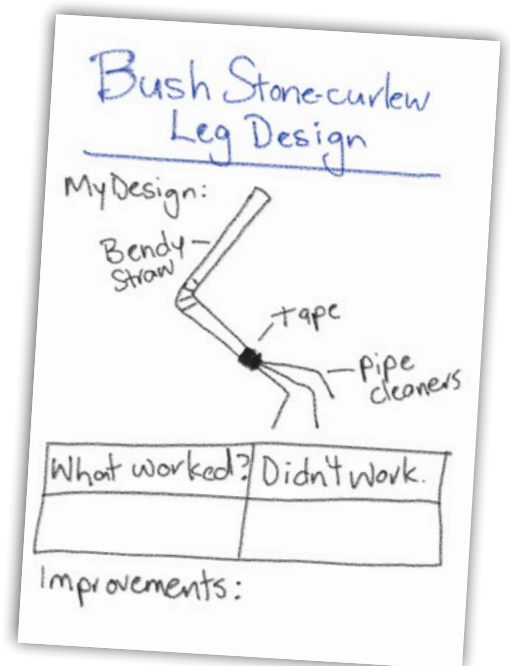
Bush Stone-curlews have long, gangly legs and big feet with long toes and a strong nail. As well as making the bird stable fast and agile, these features are perfect for digging in the soil and leaf litter. Their long leg and large foot acts like a type of three pronged rake.



STUDENT TASK

Your job is to design and then create your own Bush Stone-curlew leg and foot and then test it to see if it is a good attribute to have when digging in the soil and leaf litter.

1. **Study** the Bush Stone-curlew leg and foot to find out if this adaptation is good for finding food. Make your own sketch of the leg and foot. Label the different parts of your sketch with some ideas of possible materials you could use to make your replica.
2. **Make** your own Bush Stone-curlew leg. You can use whatever materials are available in your classroom, in the school ground, or anything you can bring from home.
3. **Test** the effectiveness of your creation. Head outside to a garden bed in your school grounds and use your 'legs' to dig around in the soil and leaf litter (or mulch). Would your leg be able to perch on a tree?
4. **Describe** whether you think your design worked. Why or why not? Compare your design to some of your friends.
5. Are there any **improvements** you could make to your design to make it more effective? If you have time you may wish to try and add these improvements.



THE CAMOUFLAGE DEFENCE

If a Bush Stone-curlew feels threatened it freezes still and tries to blend in with its surroundings. It uses camouflage as a defence to try and hide itself from predators.

So what do Bush Stone-curlews have that help them use camouflage as a defence?

Colours of the Curlew

A Bush Stone-curlew's plumage is mottled brown, white and grey, making an effective match for the leaf litter, grasses, sticks, branches and understorey of the Australian bush. The broken up brown, white and grey tones help them disappear into the colours around them.

Matching colours with the surroundings is the most important part of using camouflage as a defence.

Don't move a muscle

Bush Stone-curlews have the ability to freeze still and stop moving almost instantaneously. When trying to hide, staying still means that they are less likely to be detected as movement attracts attention.

Try this for yourself. Go and stand at the window of your classroom (or outside). Stare across the school yard. You will notice that if something moves it will be far more likely to draw your attention and you will then focus on it.

When being perfectly still, the Bush Stone-curlew also avoids making any noise that would attract predators with sensitive hearing.

Being still is essential to using camouflage as a defence.

CURLY FACT

Camouflage is "a way of hiding something by covering or colouring it so that it looks like its surroundings."



Endurance to be still

Bush Stone-curlews also have the ability to stand still for long periods of time. They rely on this when resting in their day roosts.

“At their day roost they will stand quietly with their eyes half-closed sometimes resting on one leg. They’ll also spend time lying on the ground with their legs tucked forward under their body”

Being still for long periods can also help when using camouflage as a defence.

It’s all in the pose

Bush Stone-curlews are known for their strange, often comical stances when they freeze still. They use their long bodies, limbs and neck to create what sometimes seems to be totally random poses. They assume these odd looking postures for a number of reasons:

- *To change their shape.* One of the ways predators can identify their prey is by recognising its shape or outline against its surroundings. By stretching out and holding limbs at strange angles the Bush Stone-curlew hopes that predators will be less likely to recognise their shape against its surroundings.
- *To resemble other things.* By using these strange postures they try to resemble other objects in their surroundings. When they freeze they can often look like bark, sticks and logs jutting up.

Smell is a powerful sense

The weakest part of using camouflage as a defence is that it does nothing to hide a Bush Stone-curlew’s smell. You might not be able to smell a bird when walking through the bush, but two of their predators can.

Cats and foxes have an enormous impact on Bush Stone-curlew populations. One of the reasons is that their sense of smell is very powerful; much more sensitive than humans.

A cat’s sense of smell is around fifteen times more sensitive than a humans and a foxes sense of smell is around fifty times. As smell is such an important sense, they also both have an advanced smell memory. Once they have the scent of something, it is thought that they commit it to memory and will always be able to identify the smell.

When a curlew freezes using camouflage as a defence, predators like foxes and cats can still find them easily due to their powerful noses.



ACTIVITY: WHERE'S CURL?

Curl can't stop getting into our activities, so here's your chance to find Curl's many hiding spots. Search this photo and see if you can find 15 images of Curl the Bush Stone-curlew as he uses his camouflage to hide.



PHOTO: A COMMON WAY OF FINDING CURLEWS IS TO PLAY THEIR CALLS AND LISTEN FOR A RESPONSE.

BREEDING

Bush Stone-curlews usually form what is known as a monogamous pairing. This means that once they find a breeding partner (mate) they form a bond that can last for 30 years; they mate for life. Their courtship ritual is a complex dance display that is performed both in the air and on the ground. These displays also involve the curlews being very vocal by highlighting their dance with a lot of calls.

The Bush Stone-curlew's breeding season lasts from July to January, with two eggs laid between August and November. If conditions are good, sometimes another two eggs are laid between November and January.

Nesting sites occur out in open woodland or in ploughed paddocks, as they like to have good visibility all around. This good visibility means both birds can keep an eye out for predators. The nests themselves are located on the ground. Eggs are laid in a shallow scrape in the soil, which makes both the eggs and parents very vulnerable. Bush Stone-curlews will often use the same nesting sites year after year with some sites known to be used for decades.

Bush Stone-curlews are very active parents. They are both involved in the incubation of the eggs, defence of the nest and chicks, as well as rearing their young. While one parent provides care, the other will feed nearby so it can come quickly to help protect the nest or the chicks. Incubation of the eggs usually takes around 26-28 days. Once hatched, the chicks are almost immediately led away to areas containing fallen timber to hide. Parents teach the chick to feed by showing them where the food is, or putting it in front of them; they don't feed them directly like many other bird species.

During the breeding season Bush Stone-curlews become very territorial (defending their area) and protect the nesting site. If threatened, they puff out their chests and spread their wings to make themselves look as big and dangerous as possible. These displays include the birds making rasping, hissing noises which are punctuated by powerful cries.

Although they may stay with their parents for three to nine months, the chicks become partially independent at around 9 weeks old when they learn to fly. Sexual maturity occurs at around 2 years of age in the wild. At around two years of age the birds are considered adults and can breed and have chicks of their own.



CURLY FACT

Incubation is when a bird sits on eggs to keep them warm and bring them to hatching.

WATCH AND LEARN

See how a Bush Stone-curlew pair reacts when being disturbed in the breeding season.

<https://youtu.be/PpNf5yPcoqk>



ACTIVITY: CREATE A LIFE-CYCLE POSTER

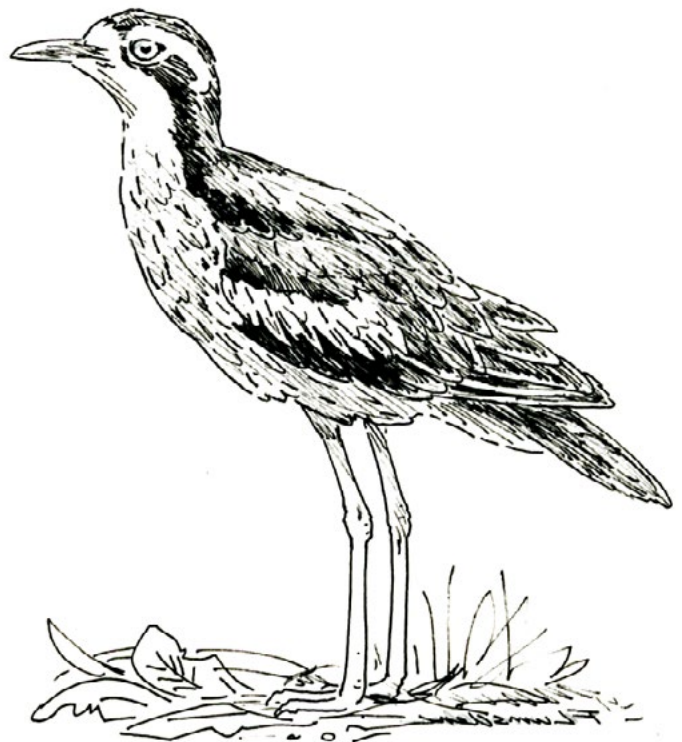
A life cycle diagram shows the life of an organism from birth to death. It can show a variety of factors that influence the survival of that species, but it is usually focused on reproduction.

Use the details of the Bush Stone-curlew breeding patterns below to create a poster with your diagram of the ***Life-cycle of the Bush Stone-curlew***.



Bush Stone-curlew breeding facts and figures

- Two curlews mate for life
- Breeding from July to January
- 2 eggs laid between August and November
- Sometimes 2 more eggs are laid between November and January
- Dazzling courtship ritual is performed
- Nesting in open woodland or ploughed paddocks
- Nests are on the ground in a shallow scrape in the soil
- Nesting sites are used year after year
- Both parents are actively involved in raising young
- Eggs have a 26-28 day incubation period
- Territorial displays with chests puffed out and wings spread
- Powerful cries to ward off predators
- As soon as they hatch the chicks are led to the safety of fallen timber
- Become partially independent at 9 weeks when they learn to fly
- Stay with parents for 3-9 months
- Sexual maturity at around 2 years old



WHY ARE BUSH STONE-CURLEWS IMPORTANT?

Have you heard or seen a Bush Stone-curlew lately? If you live in northern Australia you are probably fortunate enough to answer "Yes" to this question, however if you live in south eastern Australia, where this ground dwelling woodland bird has been steadily disappearing from the landscape, you would probably say "No" and ask "What is a Bush Stone-curlew anyway and why are they important?"

- Jan Lubke, Wingspan 2010

Bush Stone-curlews are a native species to Australia. They are part of Australia's unique and rich biodiversity.

So you may ask, "Why is it important to protect our biodiversity?" The answer is that we have a responsibility to try and preserve and protect our natural Australian environment. This includes taking care of our native animals and plants, especially those that are unique to this great country.

The Bush Stone-curlew is a striking and charismatic bird that can be found right throughout Australia. Unfortunately populations of the Bush Stone-curlew have severely dropped in numbers in southern Australia and the bird has become threatened in some areas (especially in the south-east).

Biodiversity (biological diversity) is a term that is used to describe the variety of living things on Earth. The biodiversity of our planet encompasses all life from the smallest micro-organism to the largest mammal.

There are considered to be three basic levels of biodiversity:

- The number and kinds of species.
- The Earth's ecosystems (habitats); its savannas, rainforests, oceans, forests, plains, marshes, deserts and all the other environments.
- The genetic diversity; all the different genetic variations between species.



PHOTO: S. DALLINGER

A lot of our native species decline in Australia has been the result of interactions between humans and the local environment. We directly change it by clearing, altering or fragmenting habitat for our own purposes, or indirectly change it by introducing other species that can have a toll on native plants and animals.

The plight of the Bush Stone-curlew is no different, as humans have been responsible for this decline in population. We have cleared their habitat for farmland, towns and other construction and introduced predators, like cats and foxes, that take a devastating toll on the species.



CONSERVATION STATUS

What is a Threatened Species?

A threatened species is an animal, plant or ecological community (a community of species) whose numbers have dropped so low they are struggling to survive. They are in danger of becoming extinct.

Some reasons that plant and animal species become threatened include:

- Predation and competition from invasive plants and animals
- Loss of habitat
- Changes to their habitat
- Fragmentation (breaking up) of habitat
- Illness and disease
- Food shortage
- Pollution
- Competition from human processes
- Competition from other species

Levels of Threat

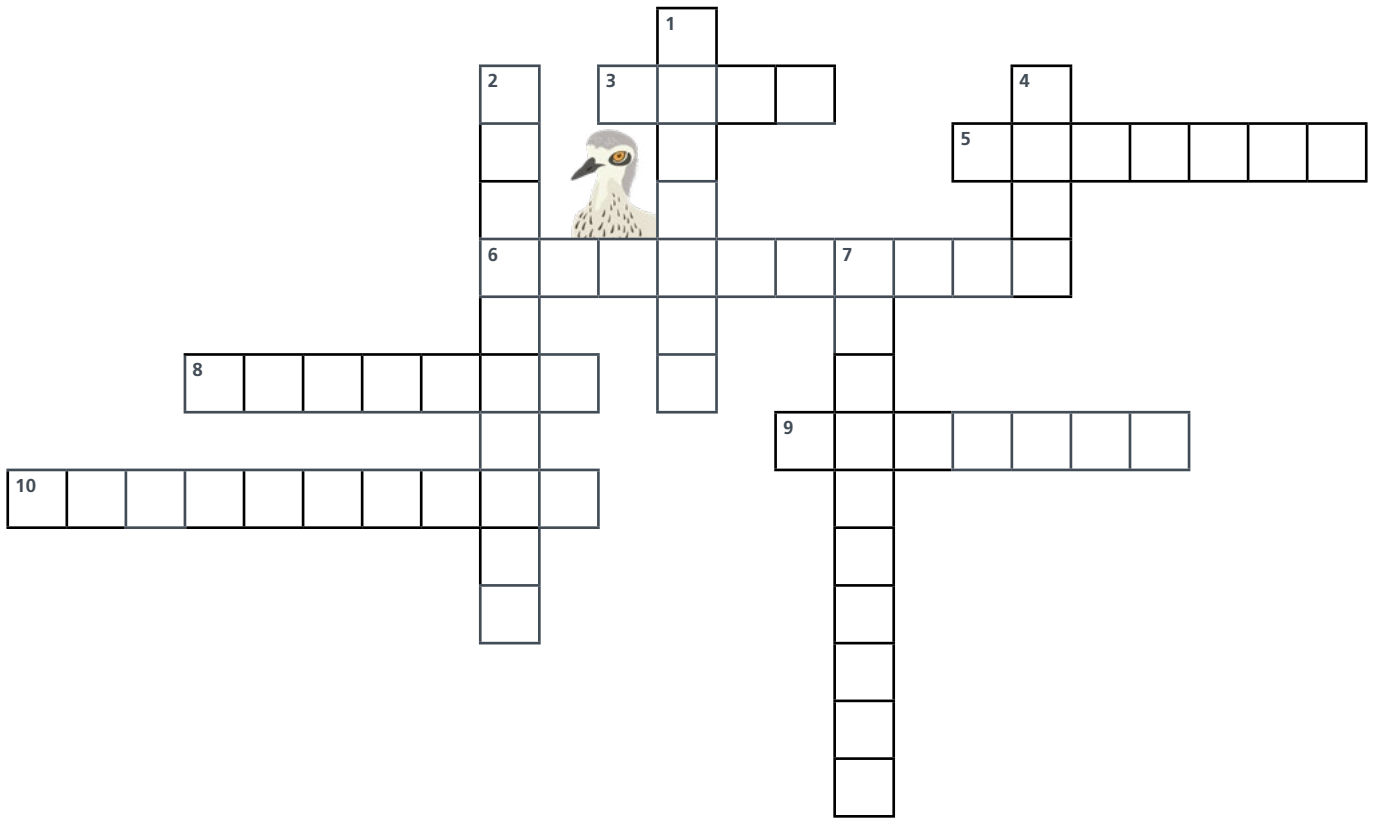
Plants, animals and ecological communities can be classified under different levels of threat. In Australia, all native species and communities are given a classification to help identify their **conservation status**. These classifications are identified under legislation, at both the State and Commonwealth level - see table below.

The Bush Stone-curlew is considered 'ENDANGERED' in New South Wales and Victoria. This is why it is extremely important that we work to protect curlew populations so that future generations have the chance to admire this wonderful bird.



Least Concern	There are healthy populations and no concerns about the species becoming threatened in the area.
Near Threatened	A species numbers have dropped to a point that they may become a threatened species in the future if this continues.
Vulnerable	A species numbers have been dropping significantly but it is not yet endangered.
Endangered	A species numbers are so low that it is close to becoming extinct.
Critically Endangered	A species numbers are so low that it is extremely close to becoming extinct.
Extinct in the Wild	There are no more of a species left in their native habitats but there are some in captivity. A species numbers are so low that it is close to becoming extinct.
Extinct	There are no more of a species left anywhere in the world.

ACTIVITY: CONSERVATION CRISS-CROSS



ACROSS

- 3. ____ shortage is a reason that plant and animal species may become threatened. (4)
- 5. Plants or animals that are very sick could die from _____. (7)
- 6. A plant or animal species whose population has dropped so low they are struggling to survive are said to be _____. (10)
- 8. If there are no more of a species left anywhere in the world, a species is considered _____. (7)
- 9. A reason that plant and animal species become threatened is Fragmentation of _____. (7)
- 10. If a species numbers have been dropping significantly, but it is not yet endangered, it is classed as _____. (10)

DOWN

- 1. When lots of animals are in the same small area they _____ with one another for food and shelter. (7)
- 2. A species numbers are so low that it is extremely close to becoming extinct is said to be _____ Endangered. (10)
- 4. If there are no more of a species left in their native habitat but there are some in captivity, they are considered Extinct in the _____. (4)
- 7. What is the threatened species classification of the Bush Stone-curlew in New South Wales? (10)

WORD LIST: THREATENED, EXTINCT, ENDANGERED, CRITICALLY, HABITAT, FOOD, VULNERABLE, DISEASE, WILD, COMPETE.

THREATS AND CONSERVATION

In New South Wales, Bush Stone-curlews are considered 'endangered', but what has affected their populations to put the species in threat of extinction? There are many threats, and they fall under three main categories of Predators, Loss of Habitat and Loss of Food. The following information looks at these threats and the actions that are being undertaken to protect the Bush Stone-curlews.



Predators

Bush Stone-curlew eggs and chicks make an easy meal for both native predators (goannas and some birds) and introduced predators (particularly foxes, dogs and cats). Adult curlews are also vulnerable, as using camouflage isn't the best defence when dealing with predators with highly developed senses, especially smell.

Foxes are thought to be the biggest predator of Bush Stone-curlews. Introduced to Australia for recreational hunting in the 1850s, foxes have adapted to most of our environments and become a widespread problem for both agriculture and our native species. Foxes are efficient hunters with highly tuned senses that help them find prey.



Cats are the other major predator of the Bush Stone-curlew. They are a perfect predator, having sensitive hearing, sharp claws, soft feet (for sneaking), exceptional vision (especially at night), sharp teeth and a long tail to give them balance. Domestic (pet) cats and feral (wild) cats are both a problem and are responsible for killing enormous numbers of native wildlife every single night.

Loss of Habitat

Clearing vegetation, fallen timber or leaf litter

Bush Stone-curlews live, feed and breed in grassy woodlands. Messy understorey in these woodlands containing leaf litter and fallen timber is essential habitat. Clearing these woodlands, through excessive firewood collection or 'tidying up', as well as clearing remnant paddock trees and their understorey for farming and urban development (towns and cities), is a major contributor to the loss of habitat for Bush Stone-curlews. Without the cover and shelter they provide, Bush Stone-curlews are more susceptible to predators. The only defence strategy the Bush Stone-curlew has against its predators is camouflage and they rely on these messy areas so they can try to blend in.



Habitat fragmentation

Bush Stone-curlews need to be able to move around to find food, water, shelter and prospective mates if they are to survive. Rural Australia has communities that rely heavily on farming and access to these farms from towns and cities via roads and railways. As a result, we have changed much of the natural landscape.

By making these changes, we have created a giant maze for native animals, like curlews, to move to new feeding grounds or find enough safety from predators. Also, Bush Stone-curlews stand no chance against cars speeding down a road as they try to cross it, or hanging around street lights, looking for a meal. This fragmentation of the landscape can have an enormous effect on Bush Stone-curlew populations.

Stock damage to habitat

Domestic farm animals can be used to manage grass height in Bush Stone-curlew habitat. If too many stock are allowed into native woodland areas, they can over-graze and trample native grasses and young saplings, preventing the ability of the habitat to naturally regenerate. Stock can also trample through nesting sites and crush Bush Stone-curlew eggs.

Too frequent fire

Fire is part of the Australian bush. In fact many plant species rely on fire to activate their seeds so they can germinate. Whilst fire is part of the Aussie bush, too frequent fires can have a serious toll on native woodland areas. If fire occurs too often it can prevent the build up of leaf litter and fallen timber that the curlews need for roosting and feeding. Too frequent fire also damages some plant species and changes the habitat.

Loss of Food Sources

The Bush Stone-curlews diet is largely made up of invertebrate (insects) and other small creatures. The use of pesticides, insecticides and other chemicals can diminish the availability of food for Bush Stone-curlews. Ingesting too many chemicals can also have a toxic effect on curlew health and can result in chick defects or sterile eggs (no chicks).

Recovery Actions for Conservation

There are a number of Recovery Actions that are listed for Bush Stone-curlew conservation. The following actions summarise those outlined in the NSW Recovery Plan for the Bush Stone-curlew, and they take into consideration the conservation requirements of the species across its known range within New South Wales.

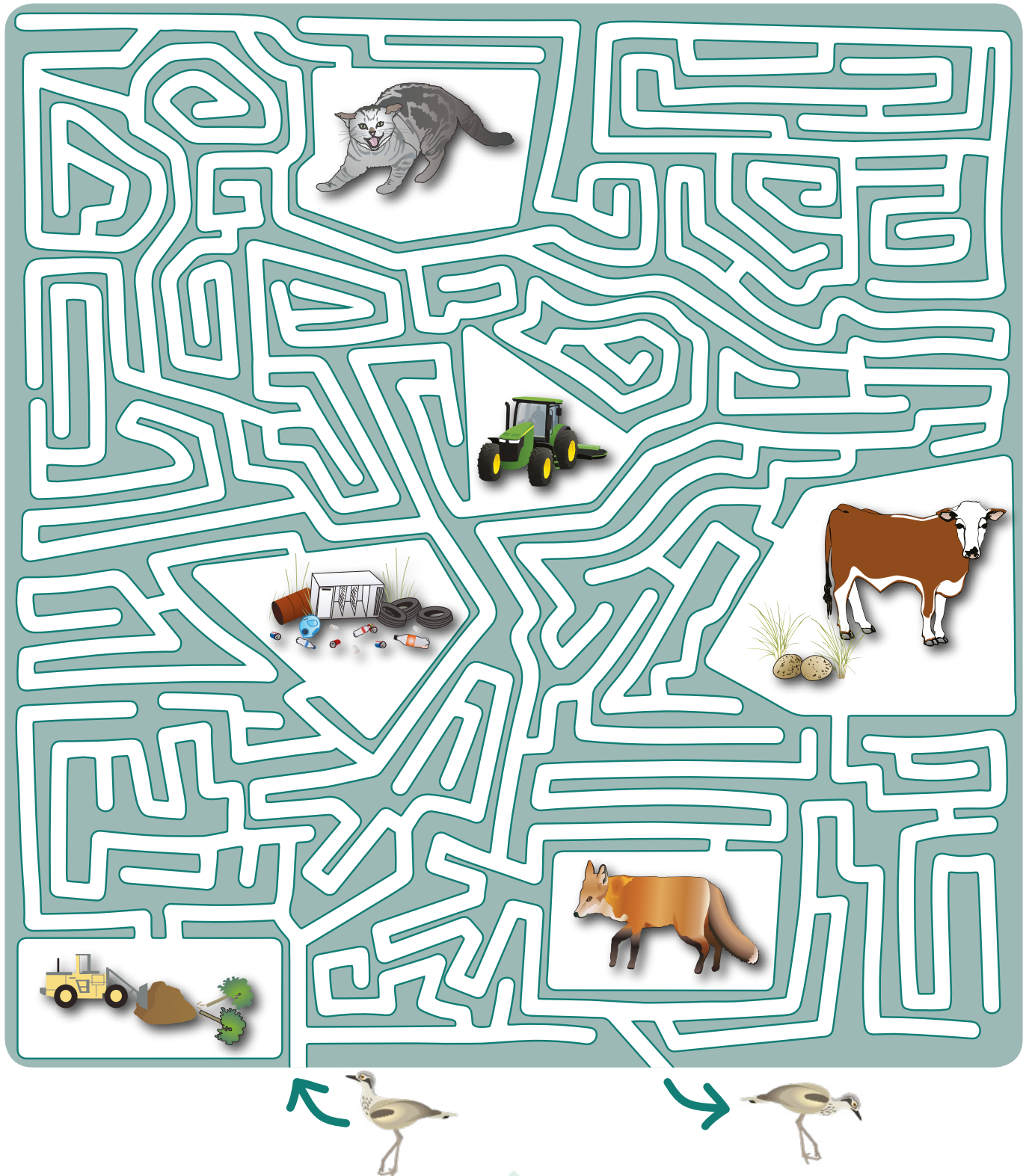
ACTIONS

- **Keep domestic dogs and cats indoors**, or in purpose built cat runs, especially at night. **Desex domestic dogs and cats.**
- Conduct **fox and feral cat control** programs, such as trapping, shooting or poisoning.
- **Retain existing vegetation** along roadsides, in paddocks and remnant stands of native trees.
- **Leave dead timber** on the ground in open woodland areas (no excessive firewood collection).
- **Increase the size of existing remnants**, planting trees and establishing buffer zones of unimproved uncultivated pasture around woodland remnants.
- **Fence off nesting sites.**
- **Fence off and manage suitable woodland habitats**, particularly those with unimproved pasture and an intact native ground plant layer.
- **Remove livestock from paddocks containing nesting areas** at least during breeding season or while eggs are in nest.
- **Reduce the use of chemicals** (insecticides and pesticides) around known curlew sites. However, when undertaking plague locust control activities environmentally safe insecticides can be used.
- Support **captive breeding and release** programs.
- **Raise awareness** of Bush Stone-curlews.



ACTIVITY: ESCAPE THE THREATS

Help Curl navigate his way through the maze of threats so that he can escape the bulldozers clearing his habitat and get to new feeding grounds.



CAPTIVE BREEDING AND RELEASE

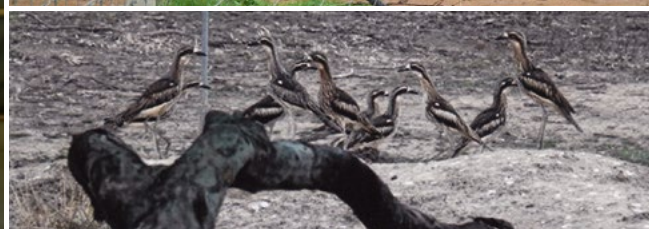
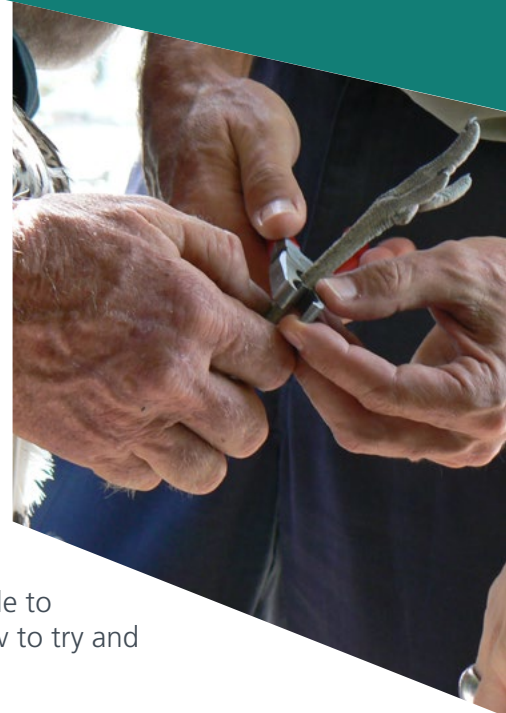
Sometimes when animal populations in the wild drop significantly they need a bit of help. Captive breeding and release programs for threatened animals like the Bush Stone-curlew become a necessary tool to help wild populations recover.

Captive breeding programs, as with curlews, usually involve a partnership between landholders, zoos/wildlife sanctuaries, university/research facilities, community groups and government. These programs are highly scientific to ensure that genetic diversity is maintained for healthy populations to flourish. Released birds also need to survive on their own in the wild. They must be able to search for food, find a mate, look after eggs and chicks, and be aware of how to try and protect themselves from predators or other threats.

The Nature Conservation Working Group has been involved in Bush Stone-curlew conservation since the year 2000. In addition to a wide range of conservation, research, education and awareness activities, they operate a successful licensed captive breeding and release program to supplement the local declining populations of curlews.

In October 2008, the Nature Conservation Working Group, in partnership with Murray Catchment Management Authority (now Murray Local Land Services), carried out the first ever successful release of captive bred Bush Stone-curlews. There have been a number of releases carried out since then. The release program has been extremely successful with the vast majority of released birds surviving and adapting well to life in the wild. The Bush Stone-curlew population at Moulamein is now much healthier and likely to survive into the future, thanks to the success of this project.

Recently, several other captive breeding and release programs have been implemented across southern Australia. These programs are another way that communities are working together to conserve and protect Bush Stone-curlews.



ACTIVITY: CURLEWS AT OUR PLACE

Follow the story of the Snow family to see how much you know about Bush Stone-curlews.

John and Rebecca Snow and their three children Flynn, Sam and Rocket have recently moved from the city to a farm near Walbundrie. Their property has a mixture of native bush and paddocks for grazing and cropping. The family loves these open woodlands which lead from the national park at the back of the property right up to the house.

Being from the city, the three children knew very little about the country life and were all a bit scared of the great outdoors, especially at night. This was the time when everything in the house was quiet, but there were always lots of noises outside.

One morning Rocket asked her father, "Daddy, what are all those sounds I hear at night? There are all these terrifying noises. Sometimes I hear screeches, growling and a freaky sort of wailing."

John replied, "You kids have to realise there is nothing terrifying about our farm or the woodland. To prove it, we are all going to learn more about what is out there."

1. *That night John and Rebecca decided to sit on the porch with their children to listen to the sounds of their farm. They thought that if the kids could identify the noises then they would not be scared of them. The family were all very quiet and heard the following sounds which they recorded to identify later.*

Listen to the sounds and see whether you can identify which animal made which sound.

A B C D E F

..... Deer Bush Stone-curlew Cow Koala Dog Fox

DOWNLOAD THE PDF TO HEAR THE SOUNDS WWW.BUSHSTONECURLEW.COM.AU/EDUCATION

2. *The following morning Rebecca told the kids that there are different types of animals in the country. Some are native animals, some are domestic animals and some are feral animals (introduced species).*

Help Flynn, Sam and Rocket put the animals they heard the night before into those three categories.

Native	Domestic	Introduced

3. *Flynn loved the environment and was fascinated by native animals. He thought the wail and cry of the Bush Stone-curlew was interesting but had no idea what a curlew was. He decided to do some research so he could learn more and teach his brother and sister about it. Flynn found a helpful page on a website called 'Nature Conservation Working Group (NCWG) Bush Stone-curlew Project'.*

Help Flynn conduct his research and learn more about the Bush Stone-curlew. Follow the link: www.bushstonecurlew.com.au/about-bush-stone-curlews or use information contained in this resource "Learning About Bush Stone-curlews" to answer the questions on the following page.



A. The Bush Stone-curlew is a type of:

- reptile mammal fish bird amphibian

B. The correct scientific name is (circle your choice):

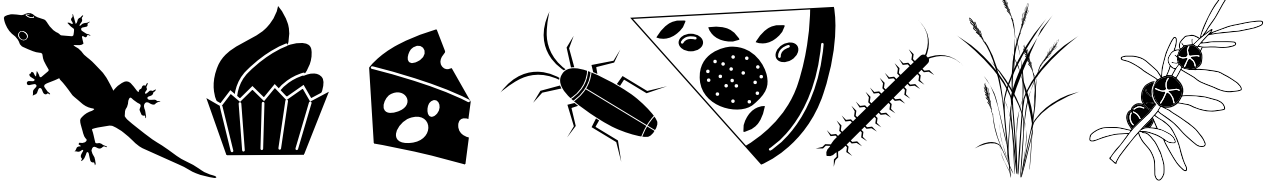
- Burhinus indicus* *Esacus magnirostris* *Burhinus grallarius*

C. How big do Bush Stone-curlews grow?

.....



D. Circle the sorts of things Bush Stone-curlews like to eat?



E. Colour in the breeding season for Bush Stone-curlews

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

F. Fill in the missing word.

Bush Stone-curlews are a threatened species that are classified as in New South Wales.

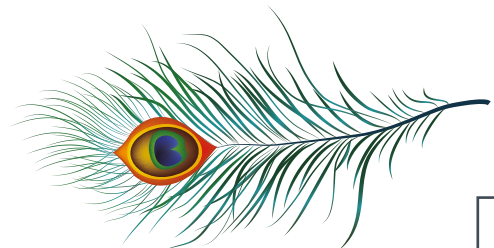
4. Flynn taught Sam and Rocket what he had learned about the Bush Stone-curlew. They all decided that they were really interesting animals.

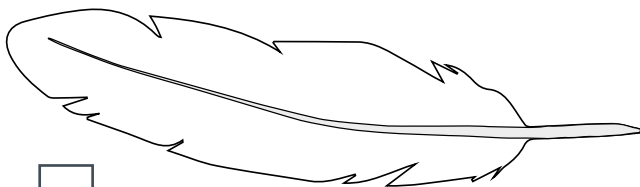
Sam found three different types of feathers near some fallen timber underneath some trees. He did some more research to try and identify if one of them was a curlew feather.

Identify which picture below could be the feather of a Bush Stone-curlew. The feathers are from:

A - Bush Stone-curlew, B - Peacock, C - Australian Magpie and D - Sulphur-crested Cockatoo.









5. The Snow family knew that curlews were around as they heard them but no-one had seen one yet. They got out their binoculars and looked to see if they could spot any on their property.

Rocket sees some curlews through the binoculars. Describe what they look like in the space provided.



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6. John and Rebecca decided this would be a perfect time to teach the kids about protecting native animals, especially threatened species. The kids were interested to learn about why an animal like the Bush Stone-curlew was endangered. They had a family discussion and asked the kids to think of three things that were most likely to be a reason for the curlews to be under threat.

Help Flynn, Sam and Rocket decide which 3 things are threats to the Bush Stone-curlew.

- Bush Stone-curlews aren't threatened at all but migrate to South America each year
- Predators like foxes and cats
- Adult Bush Stone-curlews eat each others young
- People collect curlew eggs to have with their bacon for breakfast
- Loss of habitat such as fallen timber
- A rare disease called *funkfeatheritus* that makes a curlew lose all its feathers
- Loss of food resources due to pesticides and chemicals
- Cows and sheep eating curlew chicks and eggs



7. Rocket became very worried about threats to Bush Stone-curlews because she had a pet cat named Tiger. Her parents told her that they could do some simple things to try and make sure Tiger wouldn't be able to hunt native animals on their property.

Help Rocket by suggesting actions that the Snow's could do to prevent Tiger from hurting any curlews.

- A. Keep control of her pet cat:
-
- B. Stop her pet cat from breeding:
-

8. *Flynn and Sam were worried that one of the noises they identified on their recording was that of a fox. They wondered why foxes were such a danger to Bush Stone-curlews.*

Answer the following questions to help Flynn and Sam understand why foxes are so dangerous

What makes the fox such a dangerous predator to curlews?

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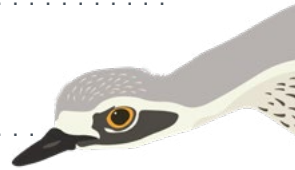
.....

Why is camouflage not the best form of defence when it comes to foxes?

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9. *John and Rebecca taught the kids about some other things that affect the habitat of Bush Stone-curlews. They told them that clearing vegetation, fallen timber or leaf litter, firewood collection, habitat fragmentation, stock damage and use of harmful farm chemicals can hurt curlew populations.*

Using the information from Page 30-31 'Threats and Conservation' in this resource (Learning About Bush Stone-curlews), list the Recovery Actions for Conservation that could help protect the Bush Stone-curlew habitat on the Snow farm.

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10. *The Snow family learned that there were some great groups who are helping the Bush Stone-curlew by running captive breeding programs. These groups work tirelessly to help breed curlews so they can release them back into the wild and increase their populations. The Snow's decided to contact their local group, the Nature Conservation Working Group (NCWG), to see if they could find out what they do and if there was a possibility of some curlews being released on their property.*

John and Rebecca asked the kids to work together and write a letter/email to NCWG.

Write a letter to NCWG from the perspective of Flynn, Sam and Rocket. Include information about what you know about the Bush Stone-curlew, why it is endangered in NSW, what things that you have done on your farm to help local curlews out, and whether you could come and visit them to see their curlews.

If you have been enjoying learning about Bush Stone-curlews, then your class may actually like to learn more from NCWG and their Bush Stone-curlew Project. www.bushstonecurlew.com.au

ACTIVITY: CLASSROOM MASCOT

Why not support the conservation of Bush Stone-curlews by adopting them as your class mascot?

SOME IDEAS FOR ACTIVITIES

1. **Know your mascot.** The first thing to having a animal mascot is to learn about what it is. Work through as many of the activities provided in 'Learning About Bush Stone-curlews' (this resource) so you are very familiar with Bush Stone-curlews. You may also wish to do your own research to find out more.
2. **Design your mascot.** Research some hints and tips about designing mascots on the internet and then hold a competition to see who in your class can come up with the best illustration to represent a Bush Stone-curlew. Some things to consider would be: make sure it simple, make sure it is easily recognisable, choose colours wisely, give it personality, exaggerate unique features and make it so it can be replicated (copied).
3. **Name your mascot.** Have a brainstorming session on the whiteboard to try and come up with the name for your Bush Stone-curlew mascot. Give anyone who feels strongly about any of the names a chance to speak to try and convince the others. Hold a vote to decide on the best name from all of the suggestions.
4. **Give it your mascot character.** The mascot will mean more to your class if you try and develop its character. Use your knowledge of Bush Stone-curlews to write some stories or poetry about your mascot. This will help bring your mascot to life.
5. **A 3D mascot.** Use craft supplies to design and build a representation of your Bush Stone-curlew mascot. You can use whatever materials that you find in your school or your teacher provides.
6. **Dance the dance.** Bush Stone-curlews are know for their striking courtship dances, behaviours and eerie calls. See if you can find videos on the internet showing their different behaviours and then design a dance or create a short play that shows these features of your mascot off. You could then present your mascot at assembly and show your dance/play to your school.
7. **Action list.** Bush Stone-curlews' are a threatened species in some areas of Australia. As a class see if you can come up with some actions that you could do to help their survival.
8. **Share your mascot with us.** The Nature Conservation Working Group (NCWG) is an environmental group that is comprised of several like-minded landholders who have a desire to ensure the survival of the iconic Bush Stone-curlew (www.bushstonecurlew.com.au). They work hard to try and help ensure the survival of this threatened species. If your class adopts the Bush Stone-curlew as a mascot they would love to see a few of the things you have done. Share a few photos of your achievements with them by having your teacher email them to ncwg@bushstonecurlew.com.au



BUSH STONE-CURLEW POEM

by Australian Poet Hazel Hall

DOWNLOAD THE PDF TO HEAR THE POEM
WWW.BUSHSTONECURLEW.COM.AU/EDUCATION



When the moon gleams silver white
 I hear the bush stone curlew write
 Its piercing notes upon the night

Oh bird as motionless as stone
 When peril strikes your bushy home
 You fade into the bark and loam

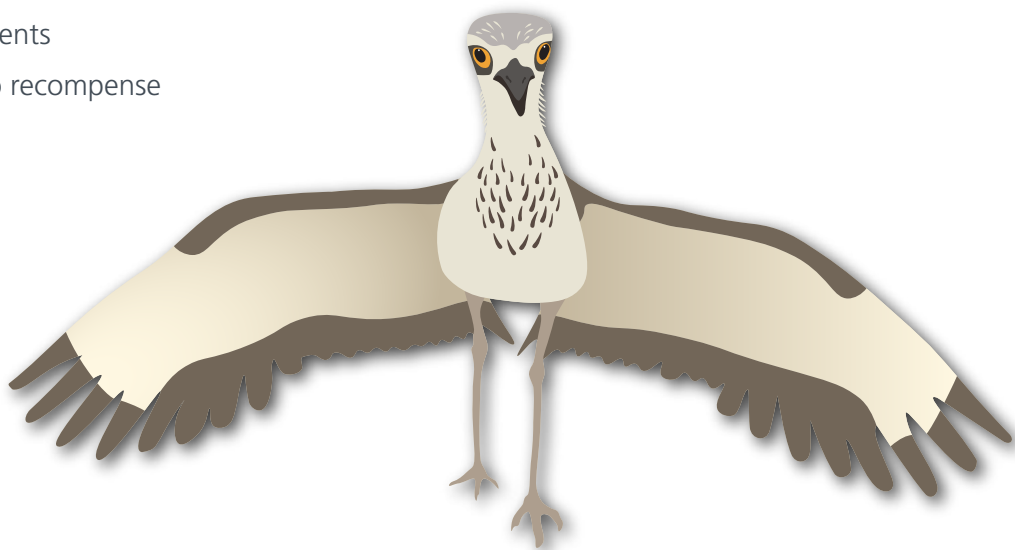
Ngamirliri, spread your tail
 With fan-like wings through soils of shale
 Dance the story you bewail

In movements terrible and tense
 In cadences of sentients
 The loss that has no recompense

Wer-looo wer-looo ki-liri-coo
 In cascades of nocturnal blue
 Let dreaming spirits follow you

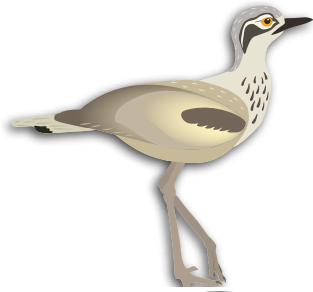
For they can read that yellow eye
 Like topaz when your plaintive cry
 Shatters the silence of the sky

As you sing your autograph
 On woodland habitat held fast
 Let this not be its epitaph



This poem was first posted as part of the [Bimblebox Art Project](https://bimbleboxartproject.com). Its aim is to creatively engage with and to document the [Bimblebox Nature Refuge](https://bimblebox.org) which is under threat from coal mining. <https://bimbleboxartproject.com> <https://bimblebox.org>

CURL'S COURAGEOUS QUEST



**START
CURL'S
QUEST**

**CURL HIDES
FROM FOXES
ROLL AGAIN**

**FOXES
ARE NEAR
MISS A TURN**

**WEIR-LOO
WEIR-LOO
ROLL AGAIN**

**A FOX GETS
YOUR SCENT
RUN AWAY**



**CURL FINDS A
SAFE PLACE TO REST
CHOOSE YOUR PATH
BEFORE YOU ROLL**



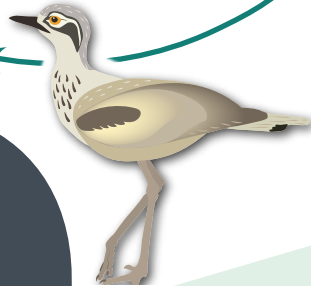
**VOLUNTEERS
PLANT NEW
HABITAT
GO FORWARD
3 SPACES**

**ONE CHICK IS
TAKEN BY A FOX
MISS A TURN**

**RUBBISH IS
EVERYWHERE AND
FOOD IS SCARCE
MISS A TURN**

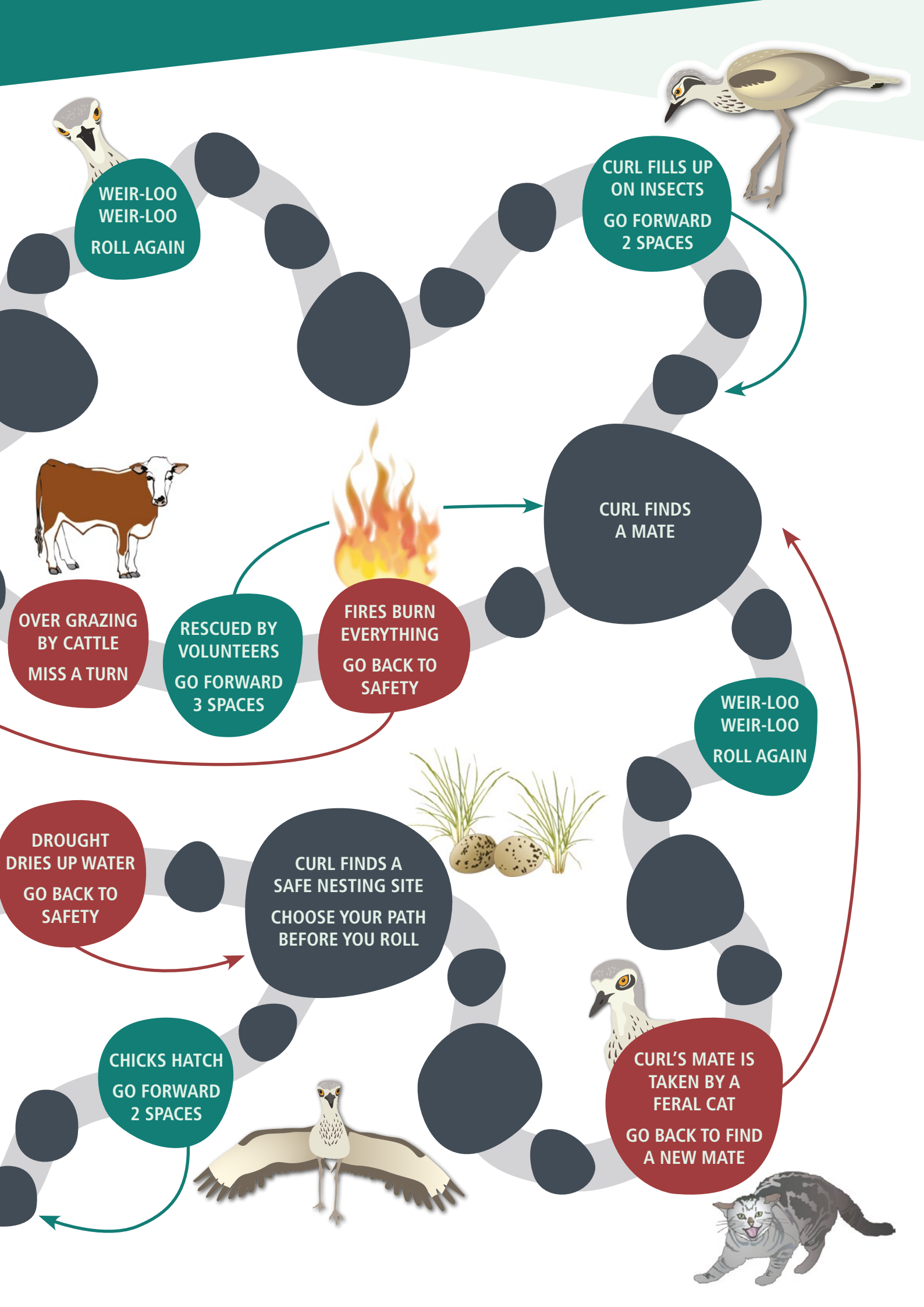


**CURL'S
NEW
HOME**



**WEIR-LOO
WEIR-LOO
ROLL AGAIN**

Help Curl find his way to his new home. Using tokens and a single dice, each player takes a turn to roll the dice and move their token around the board. Try to avoid all the threats.



WEIR-LOO
WEIR-LOO
ROLL AGAIN

CURL FILLS UP
ON INSECTS
GO FORWARD
2 SPACES

CURL FINDS
A MATE

WEIR-LOO
WEIR-LOO
ROLL AGAIN

OVER GRAZING
BY CATTLE
MISS A TURN

RESCUED BY
VOLUNTEERS
GO FORWARD
3 SPACES

FIRES BURN
EVERYTHING
GO BACK TO
SAFETY

DROUGHT
DRIES UP WATER
GO BACK TO
SAFETY

CURL FINDS A
SAFE NESTING SITE
CHOOSE YOUR PATH
BEFORE YOU ROLL

CHICKS HATCH
GO FORWARD
2 SPACES

CURL'S MATE IS
TAKEN BY A
FERAL CAT
GO BACK TO FIND
A NEW MATE

COLLABORATORS

Nature Conservation Working Group

www.bushstonecurlew.com.au

The Nature Conservation Working Group (NCWG) is a non-government organisation working within the Murray Region of New South Wales. The group has been involved in several different conservation projects over the years, however since 2003 their prime focus has been on actively promoting the protection and conservation of the iconic Bush Stone-curlew (BSC), a nocturnal, ground-dwelling bird that is now officially listed as endangered in the New South Wales and Victoria, and rare in South Australia.

During this time the NCWG has undertaken a number of extensive education and on-ground works programs, including the development and operation of a successful licensed BSC captive breeding and release program. The aim of the BSC captive breeding and release program is to help reverse the decline of the BSC within the Murray Region and beyond by supplementing the diminishing wild population with young captive bred birds.

The program's first release occurred in the Moulamein district of New South Wales in 2008 when 15 BSCs were released into the wild. Since then several more BSC releases have been undertaken, with over 160 young captive bred BSC being released to date. The majority of these released birds have successfully adapted to their new life in the wild and are now producing chicks of their own.

Murray Local Land Services

murray.lls.nsw.gov.au

Murray Local Land Services is a regionally based NSW Government agency that delivers quality, customer-focused services to farmers, landholders and the community. We work with land managers and the community to improve primary production within healthy landscapes. Murray Local Land Services (and formerly Murray Catchment Management Authority) have been involved in supporting Bush stone-curlew conservation in the region for over 10 years. This has included partnering with Nature Conservation Working Group on their successful breeding and release program, conducting education and awareness events and programs and providing funding to landholders to support habitat management for bush stone-curlews. Murray Local Land Services also supports a range of school education programs focused on natural resource management and conservation of threatened species.

Petaurus Education Goup

www.wirraminna.org.au

Providing rich learning opportunities for schools and the community to learn about iconic and threatened species such as the Bush Stone Curlew is a focus for our organisation. The structured and engaging activities from this resource will help understand and learn about the plight of this very special bird rarely seen in our area now.

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