CELEBRATING WETLANDS & WATER

Proudly brought to you by BirdLife South Africa, Water Wise & partners

BE A WETLAND WARRIOR VITY BOOK Δ

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What are Wetlands?

Wetlands are exactly that - 'wet lands'. Wetlands are places where there is standing water on the ground for at least part of the year. Wetlands have water plants (e.g. bulrushes, reeds and lily pads) that are adapted to growing in very wet conditions. Water animals (e.g. hippos, White-winged Flufftails, flamingos) are also found in and around wetlands.



Credit: Marc De Fontaine, Rand Water.

An ecosystem is made up of all of the living and non-living things in an area. Wetlands are incredible ecosystems that provide food and homes to many animals. But wetlands aren't only important to wildlife; they help humans too. A special type of soil that is full of water, called hydric soil, is found in wetlands. This soil helps in times of flooding by absorbing water like a sponge, and storing that water to be released in drier periods when it is needed the most. Wetlands absorb carbon dioxide through photosynthesis, and store carbon in the plants. Carbon is also trapped in the wetland soils. Wetlands store 30% of all the carbon found on land. Wetlands are also used for recreation and tourism e.g. fishing, hiking, canoeing, and birdwatching.

Wetlands are the halfway world between a land ecosystem and a water ecosystem. They are sometimes called sloughs, marshes, bogs or swamps. People sometimes get confused between wetlands and lakes. Lakes have very clear boundaries - you always know where the edge of the lake is - but in wetlands the boundaries change all the time depending on how much water is in the wetland. You can read more about why wetlands are important on page 6 of this book. Also, take a look at the 'Wetlands are nature's way of providing water' poster, which is on the inside back cover of this book.

Did you know? Approximately 300 000 wetlands remain in South Africa. Source: Department of Environmental Affairs

Find out where the wetland closest to your school is. On page 14 of this book is a wetland survey that you can use for a visit to a wetland.

> Why don't you take the "Wetlands are Water Wise" quiz? You can find it at https://forms.gle/EH4nUmxSh2QRUviJA

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Becoming a Wetland Warrior

Wetlands were once called 'wastelands' because people did not know how important they were. Many wetlands were drained and used for other things, like farms and places for people to live. Now people and governments know how important they are and many projects have been set up to protect wetlands. Wetlands can be destroyed by fires, overgrazing, farming, draining, mining, litter and pollution.

Here are some things you can do to protect wetlands, water and the waterbirds who live there:

- Don't litter, organise litter bins, and make sure the bins are cleared.
- Don't build or buu a house in a wetland.
- Make people aware of the benefits of wetlands.
- Encourage communities to use wetlands responsibly.
- Organise community wetland clean-ups.
- Love and respect wetlands and nature.
- Build bird hides and organise bird viewing outings.
- Use water with care.

This book will show you how you can play your part in being a Wetland Warrior. You will also learn about a special kind of bird called the White-winged Flufftail. It is one of the world's rarest birds. Flufftails love wetlands. If wetlands are not looked after, there may not be any flufftails left in the world! You will find out more about these birds on page 8 of this book.

Use and share

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The Flufftail Festival

The aim of the Flufftail Festival is to raise awareness about water (a critical resource) and wetlands (a threatened habitat) through waterbirds (especially the critically endangered White-winged Flufftail) which hopefully will lead to taking environmental action.

The partners involved in the festival are:

- · Joburg City Parks and Zoo ⊕ www.jhbcityparksandzoo.com

The production of this booklet, and its distribution, was made possible due to a kind sponsorship from Toyota Motors South Africa. THANK YOU!

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A Drop Goes a Long Way

Wetland Warriors use Water Wisely!

South Africa has a limited supply of water, and our water resources are under enormous pressure due to our population growing, ongoing development, pollution, destruction of wetlands, and the effects of climate change. It is predicted that the demand for water in South Africa will be greater than the total supply of water by 2025. The only way that we can solve this problem is by changing our attitudes and our behaviours to use water more wisely.

World Water Day is celebrated on 22 March

- 1. In this worksheet, you will calculate the amount of water you use in a day, a week and a year. But first, take a moment to estimate the amount of water that you believe you use: I think I use about litres per day and about litres per week.
- 2. Complete the following table to calculate the amount of water that you use:

	Number of	Approximate amount	Total wa	er used:	
Activity:	times per day:	of water used:	Litres per day:	Litres per week:	
Taking a:			-		
- Full bath; OR		300 litres			
- Half a bath		150 litres			
Showering for:					
- 5 minutes; OR		75 litres			
- 10 minutes; OR		150 litres			
- 15 minutes		225 litres			
Flushing toilet		10 litres			
Washing hands/Brushing teeth (30 seconds)		3 litres			
		Totals:			
Multiply your weekly tota	l by 52 to calculate your y	jearly water use:			

З. How did your estimated daily and weekly water use compare to your actual water use totals? Are you surprised by the results of this exercise? What does this tell you about using water wisely?

Colour in the robot and then use it as a guide to see how Water Wise you are. 4



RED 157 litres and above per person per day.	YOU ARE A WATER WASTER You are not Water Wise. Please change your attitude towards how you use water, and learn how to become Water Wise.
YELLOW 131 – 156 litres per person per day.	YOU ARE NOT VERY WATER WISE Now and again you practise Water Wise ways, but there are times when you waste water. You need to improve on your Water Wise habits.
GREEN 130 litres and below per person per day.	YOU ARE WATER WISE You value water and treat it with respect. You don't waste water as you know that water is life, and it is very special to all life on Earth. Remember to continue being Water Wise.

(Based on Rand Water's Water Use Efficiency Model)

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What in the World is a Wetland?

Wetland Warriors learn about wetlands!

Just like your kidneys act like filters to get rid of the waste in your body, wetlands are the 'earth's kidneys'. This is because wetlands absorb carbon dioxide and nitrogen, which pollute the environment, from the water. Building a model of a wetland will help you to understand how a wetland acts like a kidney to clean and purify dirty water in a wetland ecosystem.



Making the wetland model:

Use scissors very carefully to cut off the side of the bottle, without damaging the neck of the bottle, as shown on the right. Do not do this without adult supervision.

- Remove the lid from the cut off 2-litre bottle. (Don't throw it awau!)
- Insert the cotton wool in the neck of the bottle.
- Lie the bottle on its side, with the cut-out opening facing up.
- Fill up the bottom half of the bottle with coarse sand.
- Put a layer of fine sand on top of the coarse sand.
- Pack the stones in a little pile near the fat end of the bottle.
- Now, put the fat end of the bottle on top of the lid of the bottle.
- Rest the neck of the bottle in a small bowl, so that the bottle is at an angle going down from the fat end at the top, down towards the neck of the bottle and into the bowl.

Start your experiment:

- Fill the 2-litre bottle with water.
- Use the teaspoon to add 3 or 4 teaspoons of soil to the water.
- Close the bottle and shake it to dissolve the soil into the water.
- Open the bottle and slowly pour the water over the pile of stones in the "wetland". Keep a little bit of dirty water in the 2-litre bottle to use later.
- Watch through the see-through sides of the bottle to see what happens.
- See how the water level in the sand rises. This can be compared to the groundwater in a real wetland.
- Wait until the water has moved through the sand and flowed into the bowl.
- Compare the water in the bowl to the little bit of dirty water left in the 2-litre bottle.

Discuss these questions:

- 1. What is the colour of the water in the bowl, compared to the dirty water?
- 2. Why do you think the water in the bowl is less dirty than the water in the 2-litre bottle?
- 3. What has this experiment taught you about the importance of wetlands?
- 4. What do you think you can do differently, in your day to day lives or at school, to help protect wetlands?

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- An empty 2-litre cold drink bottle with a lid,
- An empty 2-litre cold drink bottle with a lid









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WOW! The Wonders Of Wetlands

Wetland Warriors teach others!

Wetlands are very important ecosystems in our environment. Read about the many benefits that wetlands give us.

- a. Wetlands absorb excess (too much) water caused by runoff. The soil and vegetation in a wetland hold back the water in summer and release it in winter.
- b. Wetlands slow down the flow of water causing sediment carried in the water to be deposited in the wetland, and reduce the impact of floods.
- c. Wetlands help protect, shelter and feed young wildlife and provide a safe habitat for young animals.
- d. Wetlands are nature's way of cleaning dirty water by acting as a filter, trapping sediments, dissolved nutrients, bad chemicals, like pesticides, and even germs.
- e. Wetlands provide nutrients for plants and animals.
- f. Wetlands help to purify (clean) water.
- g. Wetlands are a habitat for plants and animals including frogs, flamingos and flufftails.
- h. Wetlands are a resting place for migrating birds where they can get water and food.

Do you remember what a simile is? A simile uses the words 'like' or 'as' to compare something with something else that is not the same thing, but has similar characteristics. For example: "Thabo runs like a cheetah". This tells us that Thabo runs very fast by comparing his speed to the speed of a cheetah.

Look at the following pictures. Each of these pictures is a simile for one of the benefits of wetlands. Use the information at the top of this page to say why each of the pictures is a simile for a wetland.

1. Wetlands are like a:	2. Wetlands are like:
Reason:	SOAP Reason:
3. Wetlands are like a:	4. Wetlands are like a:
HOTEL Reason:	Reason:
5. Wetlands are like a:	6. Wetlands are like a:
Reason:	Reason:

Homework: Educate someone in your family about the benefits of wetlands and why we need to protect them.

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Auswerse (The letters refer to the list of benefits at the top of this page.) A. Sieve = d; Z. Soap = f; 3. Hotel = h; 4. Sponge = a; 5. Cradle = c; 6. House = g; Z. Stop sign = b; 8. Cereal = e















A Connected World

Wetland Warriors care about all living things!

All life is connected in delicate balances called ecosystems. Ecosystems are made up of living things ('biotic'), like plants and animals, that interact with the non-living things ('abiotic'), like the soil, stones, rocks, water and energy in their environment. Living things do one of three different jobs to maintain ecosystems - they are either producers, consumers or decomposers.

Producers are green plants. They use the sun's energy to make their own food. This process is called photosynthesis. Green plants provide food and oxygen for other living things. Consumers are living things that eat other living things. Some consumers also eat producers and/or other consumers. Decomposers break down the dead plant and animal material. Decomposers are recyclers, because they return the decomposed matter to the soil, water and air for use again. Decomposers include bacteria, fungi, earthworms and snails. It's important to note that decomposers can also be consumers. For example, snails also eat plants. The way that producers, consumers and decomposers interact with one another is called a food web, because they are all connected like a web.

Do you see how all the living things in wetlands depend on one another? They also all depend on the sun. The worms, bacteria and other decomposers are very important to the food web, because they break down all the living things, once they are dead, into nutrients that are returned to the soil and the water. All of the living and non-living things in the food web are connected. They rely on one another to survive.



Do this exercise with your teacher to see how everything in a wetland ecosystem is connected:

- Use individual A4 pieces of paper to make separate cards to represent each of the living and non-living things in this food web. If there are more learners in your class than species in the web, make more cards for snails, insects and mosquitoes.
- Hand each learner a separate card.
- Learners stand in a large circle.
- · Give one of the learners a large ball of string. The learner holds on to the end of the ball of string.
- The learner then looks at the food web and tosses the ball to someone whose card represents a connection to their card, while still holding on to the end of the string.
- The learner explains how the two interact. For example, the insect tosses the string to the dragonfly and says, "insects are eaten by dragonflies".
- The process is repeated until a whole web has been created amongst all the living things in the food web.

What happens when one of the living things in the food web is removed?

- Take a pair of scissors and cut the strands of one (or all) of the learners who have an insect card.
- · Discuss how the web collapses when the strings are cut.
- · Identify which species appear to be most affected.
- Discuss what might happen to other living things in the food web when one of the living things is removed.

An ecosystem is only in balance when all the living things that live in that space play their part in the food web. If living or non-living things are removed from the ecosystem, or changed by human behaviour, then the whole food web is affected.

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A Shy and Secretive Bird

Wetland Warriors protect Flufftails!

1. Read about the White-winged Flufftail:



Credit: Warwick Tarboton

The White-winged Flufftail is a tiny, very shy African bird. It is estimated that there are only between 200 and 250 White-winged Flufftails left in the world. This means that the White-winged Flufftail is a critically endangered species and is in danger of going extinct.

The White-winged Flufftail's natural habitat (environment) is in wetlands, surrounded by grasslands with thick vegetation. They hunt for food in the mud at the edges of reed beds, shallow water and floating vegetation, and feed on seeds and plants, as well as insects, spiders, earthworms, snails, small frogs and small fish.

From June to August every year, White-winged Flufftails live in the highland areas of Ethiopia, where they lay their eggs. Then, during April and May, they migrate south through Zambia and Zimbabwe to South Africa. They spend the summer months from November to March in the high-altitude wetland areas of the Eastern Cape, KwaZulu-Natal and Mpumalanga, before flying back north to Ethiopia during April and May. It was thought that White-winged Flufftails only breed in Ethiopia but breeding grounds have also been recently discovered in South Africa.

The main reasons why White-winged Flufftails are so endangered is because their natural habitats and breeding grounds are being destroyed by the grazing of livestock and grass cutting, as well as the draining of wetlands for farming. Almost all of their wetland habitats in Ethiopia have already been converted into farming and grazing lands and settlements. We must protect our wetlands to make sure that the White-winged Flufftail, and other endangered birds and animals, always have a protected natural habitat, where they can live and breed in safety.

2. Search this maze of letters to find these 12 words. Draw a circle around each word that you find. The words are written forwards and backwards, upwards and downwards:

Flufftail Ethiopia Wetland Habitat

Endangered

Protect

x	т	м	I	G	R	Α	т	Е	v	В	V
s	С	w	F	v	т	С	Е	т	0	R	Ρ
к	Ν	F	D	S	J	v	Q	A	Y	E	R
н	I	G	Η	L	A	Z	D	Т	G	E	z
F	т	w	К	G	С	В	Y	Ι	N	D	v
w	x	Е	В	U	F	J	Ρ	В	Ι	Y	С
J	Е	т	Η	Т	0	Ρ	Ι	A	N	z	S
v	w	L	G	Ρ	C	В	Y	н	Ι	D	К
L	I	A	Т	F	F	υ	L	F	A	x	H
D	L	N	F	Q	С	J	v	К	R	F	z
Е	Ν	D	A	N	G	Ε	R	Ε	D	С	Н
v	т	N	Е	м	Ν	0	R	I	v	Ν	Е

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Environment

Breed

Draining

Migrate

Highland

Extinct



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3. Draw a White-winged Flufftail.

Use the picture below to complete the boxes on the right-hand side. Copy each box onto your drawing, and you will draw your own bird.

4. Look at the picture of the bird on the front cover and colour in your White-winged Flufftail.













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Human Harm

Wetland Warriors never litter or pollute their environment!

- 1. Read about human activities that harm wetlands:
- Burning wetlands destroys the homes of birds and animals. When wetlands are burnt, the fire area should be carefully controlled, so that plant and animal life can return.
- Mining wetlands for their fertile soil, called peat, means that plants and animals cannot survive once the soil is removed.
- Draining wetlands by digging canals into the wetland for agriculture or development destroys the wetland.
- Pollution from human activities affects the quality of the water in wetlands. Throwing rubbish into wetlands causes disease and does not look good.
- Grazing by domestic animals, like cattle and goats, can have a positive or a negative effect on wetlands. In wetlands that have some areas grazed short and other areas left tall, the diversity of habitats increases. In wetlands which are over-grazed, the diversity of habitats is decreased.
- Farming using the healthy soils in wetlands is good for crops, but when wetlands are taken over by farming, the wetland dies.
- Planting alien vegetation, like pine trees for the timber industry • to make paper, poles and furniture kills the wetland, because these trees drink a large amount of water and dry out the wetland.































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- Play the 'A Walk in the Wetlands' game.Play in pairs or in groups. 2.

 - All players start on the 'START' square, with a token piece like a coloured disk or coin.
 Each player takes a turn to roll a dice and move the appropriate number of spaces.
 If the player lands on a square with information, the player then moves their piece according to the instruction.
 - The first player to reach the top of the wetland wins!

Finish		You find litter lying in the wetland. Move back 4 spaces.			You find insects living in the wetland. Move forward 1 space.		You find clean water in the wetland. Move forward 3 spaces.
						5	
You find ducks living in the wetland. Move forward 3 spaces.		You find canals draining the wetland. Move back 5 spaces.		You find a heron living in the wetland. Move forward 4 spaces.			You find people farming in the wetland. Move back 2 spaces.
				1 t			
You find cattle over-grazing the wetland. Move back 1 space.		You see a White-winged Flufftail in the wetland. Move forward 5 spaces.	You find alien vegetation growing in the wetland. Move back 3 spaces.		You find water plants growing in the wetland. Move forward 1 space.		You find people mining in the wetland. Move back 4 spaces.
			X				
Start	You find fish in the wetland. Move forward 3 spaces.		You find an uncontrolled fire burning the wetland. Move back 1 space.			You find rubbish dumped in the wetland. Move back 2 spaces.	You find frogs in the wetland. Move forward 3 spaces.









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Fluffing it Up

Wetland Warriors show they care with words and actions!

Many people have written poems, songs and raps to teach others about the importance of wetlands. Now it is your turn to do the same.

- Read these wetland raps for inspiration. 1.
- 2. Discuss what each rap teaches you about the importance of wetlands.
- З. In your group, choose one of the raps and find a beat that works. Practise it and present it to your class.

We're living in a wetland, wetland, wetland, Right there where the water meets the dru, dru land. We're living in a wetland, wetland, wetland, Hold it man, I am a flufftail, Living in a wetland with a hippo and a snail. Poisons in the water hurt the humans and the otter, So have a heart and do your part, you know you gotta. Wetlands are a habitat for so many species. It's like a puzzle - the picture's not done Unless you save all the pieces!

Source: https://www.youtube.com/watch?v=X33FX8pG-Dc (adapted for SA)

Sometimes they're wet, and sometimes they're not, Transition zones where the water meets the dry spot. Without the wetlands, what would we do? They're here for me. They're here for you. The kidneys of the landscape, they filter and they purify, Removing chemicals, recycling the nutrients, Slowing the flow, capturing the sediment, Cleaner water for us all! A filling station, a highway rest stop for the birds, A needed place to rest and recharge. For the ducks, geese, herons and flufftails too, A quiet, peaceful place to be. Without the wetlands, what would we do? We can't survive without these swamps and marshes, And many other creatures wouldn't make it too. And that is why... Wetlands have really important jobs to do.

Source: https://www.waterrocks.org/newsong-wetlands-have-realimportant-jobs-to-do (adapted for SA)

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Water

Wetlands have important jobs to do, Wetlands put here for me and you. Wetlands have important jobs to do, Wetlands put here for me and you. A habitat for the hippos and flufftails, We're talking about a marsh with wildlife trails. Nature makes them, why do we take them away, Just so we can get more pay? There'll come a day, in fact it's already here, Mother Earth is making it clear. Whether in the city or on the farmlands, We're heading for our own downfall, oh man!

Source: https://www.waterrocks.org/song-lyrics-wetlands-rap (adapted for SA)



Credit: Arno Ellmer

- 4. Now, it's your turn! In your group, use everything you have learned to write your own rap about the wetlands called: 'We're Wetland Warriors'.
- Practise your rap and then present it to your class. Remember that a rap needs a strong message, a 5. beat, and a chorus.



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Giving Conservation Winas

Wonderful Wetland Warriors

I am a Wonderful Wetland Warrior!









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Wetland Survey

Go on a field trip to a wetland. Please make sure that the wetland is safe to visit, and that there is an adult present with you. You should wear gloves, and do not put your hands in your mouth after touching the water. Please wash your hands with soap and clean water after touching the water at the wetland.

Your Name: _

__Name of Wetland:___

__ Date: __

- 1. Write a brief description of the wetland. (Use extra paper if you need more space to answer the questions.)
- 2.
 What activities are taking place around the wetland? (You may tick more than one.)

 Formal houses
 Cattle
 Factories
 Litter and dumping

 Informal settlement
 Crops
 Park and sports fields
 Nature area

3. What animals and plants do you see in the wetland?

Take a sample of water from the wetland using a clear container. How would you describe it? 4. (You may tick more than one.) Smelly Foamy Green Slimy Oily Clear Muddy **Dead animals** 5. What impact do you think the quality of the wetland has on the animals and plants living in and around the wetland? 6. What impact do you think the wetland has on the humans who live around the wetland? 7. What is the quality of the wetland? How bad is the problem? Do not know Not a problem A slight problem Bad What environmental problems have you identified in the wetland? 8. What do you think this means for the wetland? 9. Do not know It is bad Okay to not so good It is good What can be done to solve the problems of the wetland? 10.

You can also conduct a miniSASS activity. SASS stands for Stream Assessment Scoring System. Check out http://www.minisass.org/en/ for more information.

Have a discussion with the other learners about their wetland observations and the environmental quality of the wetland. Present your findings to the class or school and suggest solutions to the problems.

Being a Wetland Warrior means that you TAKE ACTION to take care of wetlands. Wetland Warriors LOVE and RESPECT water and wetlands!

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