

School Program

# Let's learn about Bittern!

School or educators pack.



LOVE BITTERN PROJECT

for **Independent Learners**

Ages 10-13 year olds

## GAMES

Let's learn about Bittern!  
**Bittern Boom Pop!**

A fun game to help learners identify and record a bittern booming.



## EXPERIMENTS

Let's learn about Bittern!  
**WETLAND DIY EXPERIMENTS 3 & 4**

For assisted learners. Involves counting measuring, subtracting, comparing results and discussion.

How does a wetland help make the water CLEAR?

Wetlands (plants) filter to help and filter

## ACTIVITIES

Let's learn about Bittern!  
**WORKSHEET 1 of 3**

**FILL IN THE FACTS**  
Use these words to fill in the gaps.

words: eels counting booms endangered native healthy camouflage Australia extinction brown

Australasian bittern are a large \_\_\_\_\_ wetland bird found in New Zealand. They are also live in \_\_\_\_\_



INDEPENDENT LEARNING LOVE BITTERN PROJECT



Ask someone or look up the meaning of words you don't know.

## VIDEOS



Wetlands are one of the most important ecosystems in Aotearoa, New Zealand.

# Let's learn about Bittern!



To help connect our future leaders with Bittern and their wetland homes.

## WHY?

**Bittern are a large native wetland bird just one step from extinction in Aotearoa New Zealand.**

Bittern are ambassadors for healthy wetlands, when we focus on bittern as an apex-predator in the wetlands, we also help their wetland homes and other wetland dependent species to thrive too.

Wetlands are a threatened ecosystem in Aotearoa. More than 90% of our wetlands are left and they still continue to be drained and degraded to make room for urban expansion, farming or large scale infrastructure projects like roading, wind farms and solar farms

Through Bittern we learn how the functions of wetlands help people to- wetlands help slow down the water to protect us from flooding, filter the water to keep it clean and clear, and store more carbon and have more biodiversity than any other ecosystem in Aotearoa.

Through Bittern we connect our leaders of tomorrow to help save Bittern and their wetland homes.

The Love Bittern Project's long term vision is to see Bittern thrive for future generations.

Pages contain information or activities

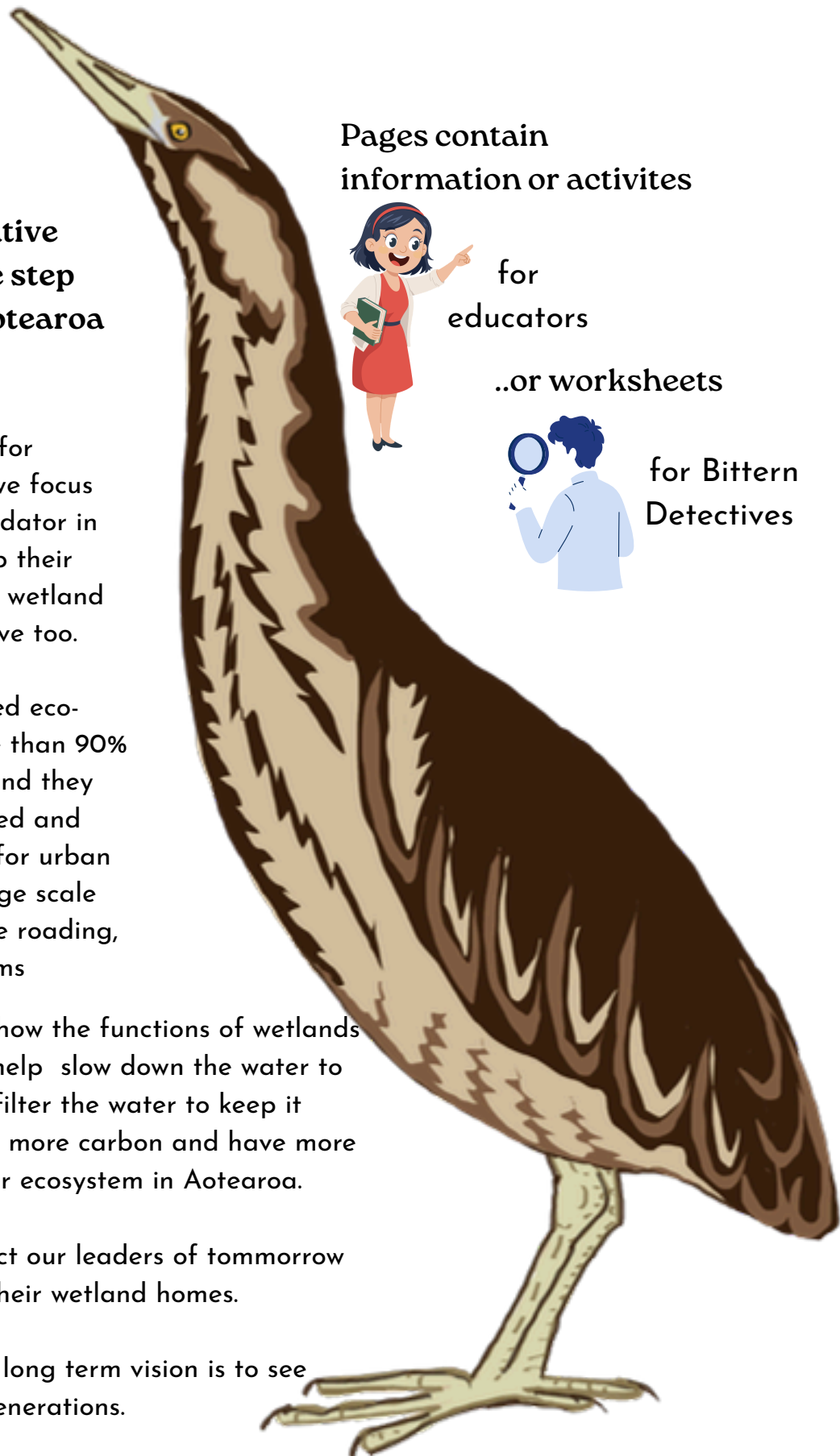


for educators

..or worksheets



for Bittern Detectives



Let's learn about Bittern!

## BITTERN BASICS

**Bittern are a large native wetland bird one step from extinction.**

Bittern are brown and light brown.

Bittern are BIG - 74cm tall, which is about the height of a dining room table.

The male Bittern booms in the spring to call in females and tell other males to stay away.

In te reo Māori their name is MATUKU-HŪREPO which means the heron who booms in the wetland.

Bittern are in trouble because most of their wetland homes have been drained or degraded, and predators like cats and stoats are eating their eggs and chicks.

Bittern mainly eat eels, fish or frogs...but they can also eat insects, snails, lizards and worms.

**Bittern need our help, to protect them from predators and restore their wetland homes to provide places to hide and clear shallow water to hunt.**



for  
educators

LOVE BITTERN  
PROJECT



The female bittern lays 3-5 eggs in a nest in the wetland reeds.

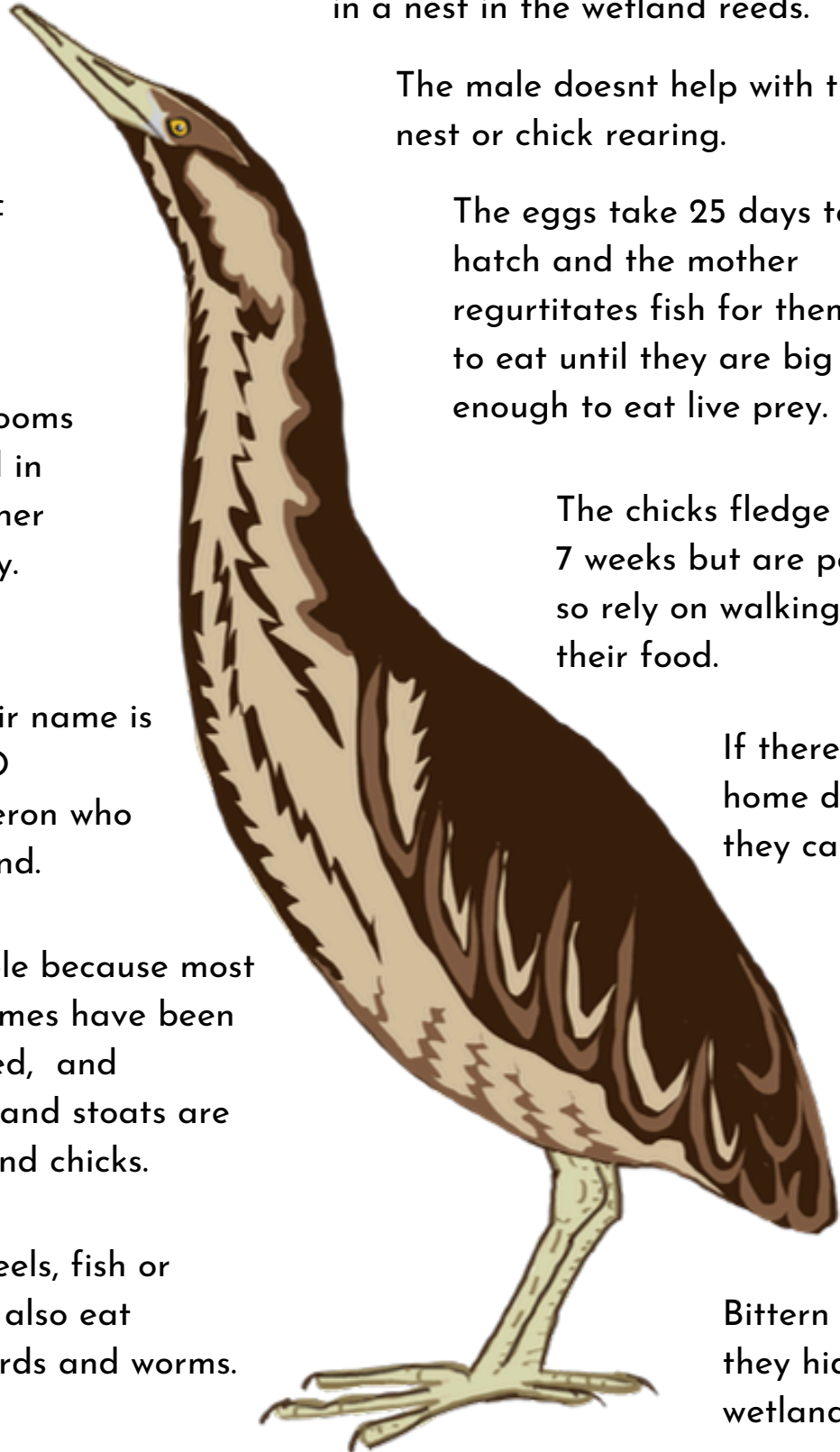
The male doesn't help with the nest or chick rearing.

The eggs take 25 days to hatch and the mother regurgitates fish for them to eat until they are big enough to eat live prey.

The chicks fledge at around 7 weeks but are poor flyers so rely on walking to find their food.

If their wetland home dries up they can starve.

Bittern are shy, they hide in the wetland reeds.



Let's learn about Bittern!

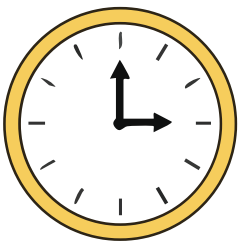
## Program Outline

This school program is for independent learners aged 10-13.



### Learning outcomes:

- Recall basic facts about bittern, where they live, what they eat, what challenges they face and how we can help.
- Recognise and record the boom of a male bittern
- Recognise features a healthy wetland that Bittern need to thrive.

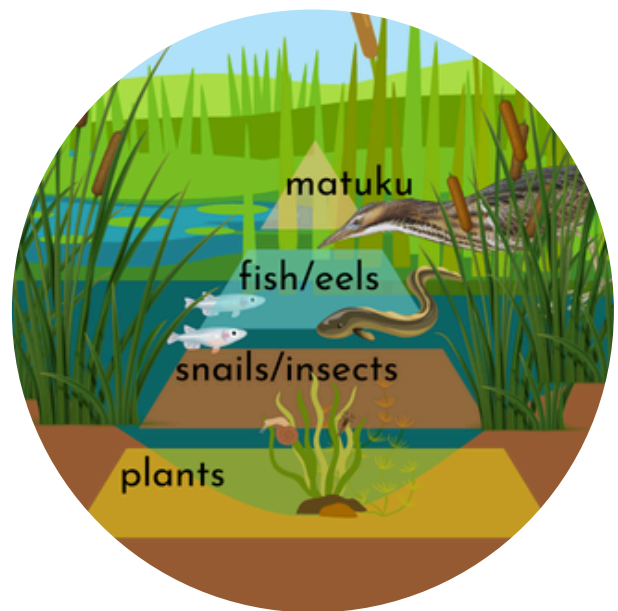


The program takes around 90 minutes for one class and is broken up into 10-20 minute segments.

PLUS- allow more time to research, create and present .

## 1. Collect the knowledge from the room (10 mins)

- What is a Bittern?
- What do they look like?
- What do they sound like?
- What do they eat?
- Where do they live?
- How many Bittern do we have in New Zealand?
- How BIG is a Bittern?
- Have you seen a Bittern?
  
- What is a wetland?
- What do we find in a wetland?
- Who eats who in a wetland?



Answers help to build a picture of the food chain.

### Resources

- Wetland characters and feature pin up cards can be printed off and put on a whiteboard as you go.
- TIP - draw a triangle on the whiteboard and ask students to place the cards where they belong in their trophic position/food chain.

Let's learn about Bittern!

## Program Outline

Break out into topic groups and fill in the knowledge gaps & start gathering information by watching the videos.



## 2. Create Focus Groups (25 minutes + time for posters) Watch the videos with discussion in between

**Split the class into 4 groups and hand out topic activity sheets.**

These sheets help information gathering to work towards creating a poster to present back to the rest of the class. Topics are:

**Identification**-what is a bittern, where are bittern found, how do we record them?

**Food**- what do bittern eat, how do they hunt, how can we help?

**Family** - what is the lifecycle of a bittern? what do they need to survive?

**Security** - what are some of the risks and threats bittern face?

For context watch a series of videos about Bittern Conservation and discuss the content in relation to their topics.

Link to Darwin200's YouTube channel:

[Episode 1](#) -Introduction

[Episode 2](#) - Challenges

[Episode 3](#) - What is the solution



## EQUIPMENT & MATERIALS

- Topic sheets printed out.
- Pens, pencils and materials to create a poster.
- Large paper for posters

## Resources

- Topic Sheets x 4

## Websites to help with research:

- [NZ Birds Online](#)
- [The Love Bittern Project](#)
- [Department of Conservation](#)

Let's learn about Bittern!

## TOPIC Identification



Use this sheet to gather information, then make a poster to present to the others.



You are working as a group. Discuss how you want to work. Does one person research each question and present it? or do you have researchers, artists and presenters?

**What is a Bittern?**

**What do Bittern look like?**

**What do Bittern sound like?**

**Are Bittern easy or hard to find? Why?**

**How and where do we record a bittern if we see one?**

**How and when is best to monitor and record males booming?**

**How can people help so bittern are identified, recorded and monitored?**



Let's learn about Bittern!

## TOPIC

### Food & Foraging Habitat

Use this sheet to gather information, then make a poster to present to the others.



You are working as a group. Discuss how you want to work. Does one person research each question and present it? or do you have researchers, artists and presenters?

**What do bittern eat? (their prey)**

**How do Bittern catch their food/prey?**

**Where do bittern hunt?**

**Do bittern have enough food?**

**What kind of water stops a bittern from being able to hunt?**

**How can we help bittern to find more food and hunt?**



Let's learn about Bittern!

## TOPIC

### Family and lifecycle



Use this sheet to gather information, then make a poster to present to the others.



You are working as a group. Discuss how you want to work. Does one person research each question and present it? or do you have researchers, artists and presenters?

**Where do bittern make their nests?**

**How many eggs do they lay?**

**Does the male and/or female look after the nest and chicks?**

**How long does it take for the chicks to hatch? (Incubation period)**

**How long do the chicks stay on the nest?**

**What happens when the chicks first leave the nest?**

**When are the chicks left on their own?**

**What are the biggest risks to nests and chicks?**

**How can we help?**



Let's learn about Bittern!

**TOPIC**  
**Security**



Use this sheet to gather information and make a poster to present to the others.



You are working as a group. Discuss how you want to work. Does one person research each question and present it? or do you have researchers, artists and presenters?

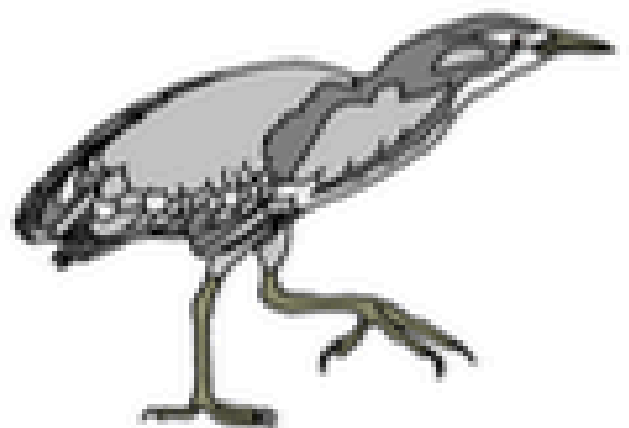
**What is the conservation status of Bittern?**

**What are the main threats to bittern?**

**What are the main predators?**

**How are people a threat to Bittern?**

**What can people do to help Bittern be safe?**



Let's learn about Bittern!

## WORKSHEET 1 of 3



INDEPENDENT  
LEARNERS



LOVE BITTERN  
PROJECT

### FILL IN THE FACTS

Use these words to fill in the gaps.

eels counting booms endangered  
native healthy camouflage Australia  
extinction brown



? Ask someone or look up the  
meaning of words you don't  
know.

Australasian bittern are a large \_\_\_\_\_ wetland  
bird found in New Zealand. They also live in  
\_\_\_\_\_.

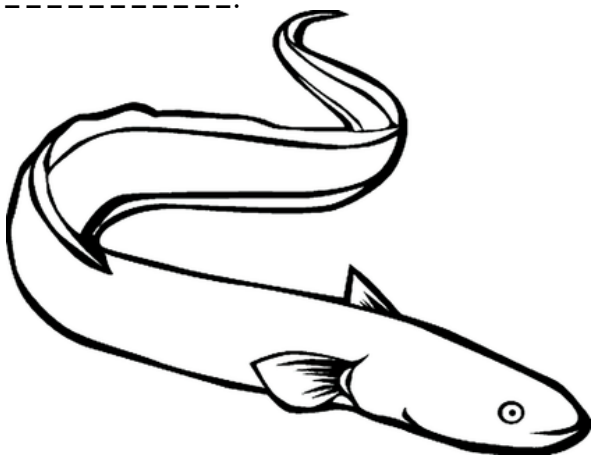
They stand as tall as a dining room table and  
are different shades of \_\_\_\_\_. Bittern like to hide,  
they \_\_\_\_\_ really well in the wetland  
reeds and rushes so are very hard to see! In the  
spring people listen in 'The Great Matuku  
Muster' for the male to boom as a way of  
\_\_\_\_\_ how many bittern we have left in  
New Zealand.

We think there are only about 700-900 bittern  
left in New Zealand. Our bittern are globally  
\_\_\_\_\_ and their conservation status  
here is 'Threatened - Nationally Critical' which  
means they are one step away from  
\_\_\_\_\_.



One of their te reo Māori names is "Matuku-hūrepo"  
which means 'heron who \_\_\_\_\_ in the swamp'. To  
Māori they are a taonga species, their boom was a  
sign of \_\_\_\_\_ wetlands where eels and fish were  
plentiful.

Their favourite food is \_\_\_\_\_ but they also like to eat  
fish or frogs and if they have to they eat insects and  
worms!



Let's learn about Bittern!

## WORKSHEET 2 of 3



Can you help Bittern?

Bittern are struggling to survive because across New Zealand over 90% of their wetland homes and hunting grounds have been drained and most of the wetlands that are left are degraded - they are either too dry, the wetland plants are chewed back by animals or they are too muddy from them stomping around.

**What would help protect wetlands and stop animals from getting in? .**

Bittern are visual hunters, they need to see their food to catch it, so the water needs to be clear and shallow for a bittern to hunt. The reeds and rushes in their wetland homes help filter the water and trap dirt to keep it clean and clear.

**What can we do to help the water in the wetland stay clean and clear?**

Bittern also need areas of undisturbed reeds or rushes over deep water to provide a barrier so they can raise their chicks safe from animals like dogs, cats and stoats.

**What can we do to help to protect bittern nests?**

Some drains and waterways where fish live have steep sides, the water is too deep or covered over so they cant use these for hunting.

**Can you think of a way to fix the drains and waterways so bittern can catch the fish?**

Sometimes bittern hunt in drains close to the road or on the road to catch lizards and a lot of bittern end up being hit by cars and trucks.

**Can you think of a way to stop cars and trucks from hitting Bittern?**



Let's learn about Bittern!

## WORKSHEET 3 of 3



Design a wetland!

For bittern to survive we need more wetlands!

We don't often think about how wetlands can help people, but wetlands have super powers! They slow down the water to protect our homes, farms and roads from flooding, the wetland plants help to keep the water clean and clear so we can fish, swim and even drink the water from our rivers and lakes.

Wetlands were traditional mahinga kai - places where food was gathered and some of New Zealand's first exports - like harakeke flax - were grown in wetlands and used to make strong ropes. Can you think of what else was caught or harvested in wetlands?

Your job is to design a wetland that bittern (and people) will love!

- Plan your wetland - look at what you've learnt - highlight some of the things a bittern needs or what people need and can do when the water is clean.
- Draw and label the things that are important.

Name of my wetland:

Let's learn about Bittern!

## Program Outline

How to identify and record a bittern booming



for  
educators

LOVE BITTERN  
PROJECT



### 3. Watch, listen and learn how a Bittern Booms! (15min)

One of their  
te reo Māori names is:  
**MATUKU-HŪREPO**  
Matuku = the heron  
hū = who booms  
repo = wetland.

Only the male bittern boom. They boom year round but are more reliably heard in the spring when they BOOM to attract females and deter other males.

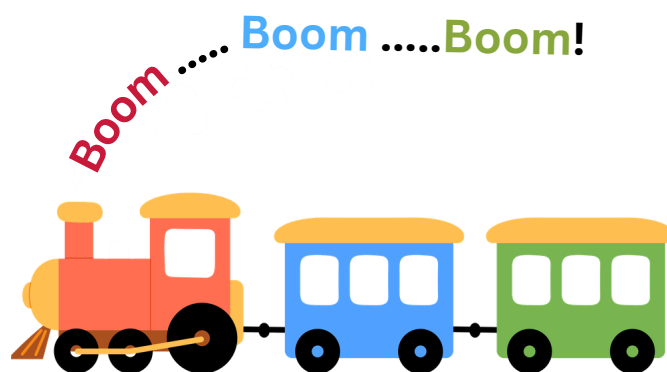
A 'boom' sounds more like a 'whoom' or the noise you make when you blow over the top of a glass bottle.

A bittern booms in a sequence of booms called a boom train.

When we record bittern we count how many booms there are in a sequence and what direction the boom came from.

#### Resources:

- Activity - Watch a [video of a bittern booming](#)
- Can anyone re-enact the boom?
- Play - Bittern Boom Pop (see next page)



Let's learn about Bittern!

## Bittern Boom Pop!

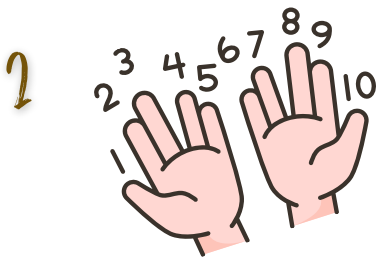
A fun game to help learners identify and record a bittern booming.



First watch the video of a bittern booming so we can see how they boom. Can anyone re-enact a bittern booming? **TURN YOUR SPEAKER ON!**



Sit quietly in a circle. Play the recording of male bittern booming over a speaker when you hear a bittern BOOM stand up (sit down again when booming stops)



Same as above PLUS stand up silently and count how many BOOMS there are in a sequence (before a pause of no booms)



Same as above BUT stay seated and close your eyes. Move the speaker outside the circle and get them to point to where they think the sound of the boom is coming from (direction) - open their eyes on a count of 3 to see where the speaker (bittern) is.

## Bittern fun facts about booming ...

- Only the male bittern booms
- The number of booms in a sequence signals how strong he is
- Bittern boom to attract females and deter other males

• Bittern boom year round but boom more in spring - breeding season

• Bittern boom most at dawn and dusk

- Young bittern can sound more like a hiccup than a boom!



Let's learn about Bittern!

## Program Outline

Experiments to look at what bittern need and how the wetland helps.



### 4. Water and wetland experiments (20 mins)

Bittern are visual hunters, they need clear water to see their food and it needs to be shallow enough that they can walk in to hunt.

The following pages contain DIY experiments that can be carried out at school to help learners understand what bittern need... and how wetlands help

#### EXPERIMENT 1



Present the ideal, demonstrating that the water is clean and clear enough for a bittern to see and walk in to catch their food.

#### EXPERIMENT 2



Present the problem, demonstrating that the water is murky and too deep and a bittern wouldn't be able to catch its food here!

#### EXPERIMENT 3



Present the solution, wetland plants trap sediment and fix bacteria to help filter the water to keep it clean and clear. Using the 'wetland sponge' to filter the water demonstrates this.

#### EXPERIMENT 4



Focusses on how wetlands help to slow down the water and keep the ground wet enough for wetland species to live there.

#### Resources:

Experiments on following 6 pages

Let's learn about Bittern!



for  
educators

LOVE BITTERN  
PROJECT



## WATER DIY EXPERIMENTS 1 & 2

**EASY.** Involves counting measuring, comparing results and discussion.

The water needs to be

**CLEAR**

Bittern are **VISUAL HUNTERS** they need to be able to see the fish in the water to hunt.



The water needs to be

**SHALLOW**

Bittern have short legs (around 15cm) to be able to walk into the water to reach fish the water needs to be 15-25cm

### EQUIPMENT & MATERIALS

- 2x tall buckets with fish drawn in the bottom.
- 2x rulers
- Sterile outdoor plant mix coffee grounds or dirt on site to make dirty water.
- Water



### STATION ONE

A bucket with fish drawn in the bottom. Fill with clean water 20cm deep.

- ? How deep is the water?  
How many fish can you see in the water?  
Could a Bittern feed in this water?

✓ A bittern can feed in water like this because its **CLEAR** enough to see fish and **SHALLOW** enough to reach fish to catch.

### STATION TWO

A bucket with fish drawn in the bottom. Fill with dirty water 30cm deep or to top.

- ? How deep is the water?  
How many fish can you see in the water?  
Could a Bittern feed in this water?

✗ A bittern can **NOT** feed in this water because its **NOT CLEAR** enough to see fish and **NOT SHALLOW** enough to reach fish to catch.



Let's learn about Bittern!

## WETLAND DIY EXPERIMENT 1



INDEPENDENT  
LEARNERS



LOVE BITTERN  
PROJECT

In your water bucket...

1. How many fish can you see?



2. How deep is the water?

? Could a Bittern feed in this water?

? Why could a Bittern feed in this water?  
How do we describe the water?



Let's learn about Bittern!

## WETLAND DIY EXPERIMENTS 1 PAGE ANSWERS



INDEPENDENT  
LEARNERS

LOVE BITTERN  
PROJECT



In your water bucket...

1. How many fish can you see?

Could a bittern feed in this water?

How deep is the water?

How do we describe the water?

2. How many fish can you see?

How deep is the water?

How do we describe the water?

Could a bittern feed in this water?



3. What happens to the water when its poured through the wetland sponge?

Compare the water at the end - can you describe the difference?

Which water could a bittern feed in?

How does the wetland help bittern?

3. What happens to the water when its poured through the wetland sponge?

How much water is left?

Where did the water go?

How does the wetland help bittern?



Let's learn about Bittern!

## WETLAND DIY EXPERIMENT 2



INDEPENDENT  
LEARNERS



LOVE BITTERN  
PROJECT

In your water bucket...

1. How many fish can you see?

2. How deep is the water?



? Could a Bittern feed in this water?

? Why can't a Bittern feed in this water?  
How do we describe the water?



Let's learn about Bittern!

## WETLAND DIY EXPERIMENTS 3 & 4

**For all learners.** Involves counting measuring, subtracting, comparing results and discussion.



for  
educators

LOVE BITTERN  
PROJECT



How does a wetland help  
make the water

### CLEAR?

Wetlands (plants) act like a filter to help trap sediment and filter out pollutants.



How does a wetland

### STAY WET?

Wetlands are like sponges they soak up and slow down the water to keep wet for longer.

This means fish, eels and frogs can still live there and Bittern can still hunt.

## EQUIPMENT & MATERIALS

- 2x paint trays or trays on a lean
- 2x measuring jugs
- 2x water containers
- 2x sponges that fit tight across the tray
- coffee grounds or dirt on site to make chunky dirty water.
- Water



### STATION THREE

A tray on a lean, with a sponge across it, 500ml of dirty water and jugs to pour the water.

? What happens to the water when its poured through the wetland sponge?  
How does the wetland help Bittern?

✓ The wetland helps to make the water clean and clear so Bittern can see the fish to catch.



### STATION FOUR

A tray on a lean, with a sponge across it, 500ml of clean water and jugs to pour and measure.

? What happens to the water when its poured through the wetland sponge?  
How does the wetland help Bittern?

✓ The wetland slows the water down so they stay wet for longer for eels, fish, frogs and Bittern to live there.

Let's learn about Bittern!

## WETLAND DIY EXPERIMENT 3



INDEPENDENT  
LEARNERS

LOVE BITTERN  
PROJECT



Pour around 200 ml of dirty water slowly into the top of the tray.

1. What happens to the water when its poured through the wetland sponge?

Collect and pour the water from the bottom of the tray back in at the top.

2. What happens to the water when its poured through the wetland sponge again?



Compare the water you started with to the water that has run through the wetland:

- ? How do we describe the 2 water samples?

- ? Which water could a Bittern feed in?

- ? How does the wetland help Bittern?



Let's learn about Bittern!

## WETLAND DIY EXPERIMENT 4



INDEPENDENT  
LEARNERS



LOVE BITTERN  
PROJECT

Pour 200 ml of clean water slowly into the top of the tray.

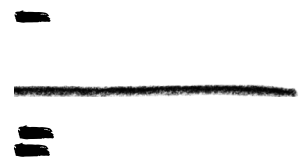
**1. WITHOUT THE WETLAND SPONGE**  
How long does it take for the water to run to the bottom of the tray?

**2. WITH THE WETLAND SPONGE**  
How long does it take for the water to run to the bottom of the tray?



200ml

**3. How much water is left at the bottom of the tray?**



Compare the water you started with to the water that has run through the wetland:

**? is there more or less water than you started with? How much water is left?**

**? What happened to the water?**

**? How does the wetland help Bittern?**



Let's learn about Bittern!

## Program Outline

Recommeneded option for real life application.



## Field Trips to a wetland

Field trips to a wetland are a great way to reinforce the learning in a real world setting.

This could be carried out in conjunction with

- fish monitoring, catching small fish in gee minnow traps to identify and measure the size of fish a bittern can eat.
- macroinvertebrate monitoring, taking a white tray out to contain and help see midge larvae, or aquatic insects (that feed the fish)
- planting reeds, grasses or rushes, to help the wetland keep the water clean and clear.
- identifying weed species and helping to remove them so native plants can grow.
- footprint monitoring, wetland birds and predators often leave their tracks in the mud this is a fun exercise to learn whos in the wetland!

### Resources:

- Activity or handout -Wetland Monitoring

nb. the wetland monitoring activity can be carried out as a field trip or can be given to learners to take home and carry out with an adult at a wetland nearby.

Let's learn about Bittern!

# WETLAND MONITORING



INDEPENDENT  
LEARNERS



LOVE BITTERN  
PROJECT

Find a wetland near you to check with an adult.

As you approach

Can you see.....  
birds flying?

They are a sign  
there are lots of insects!  
**What species can you see?**



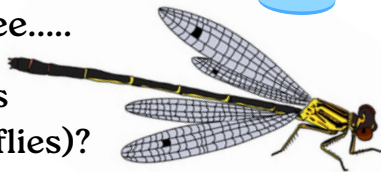
Can you see..  
a fence?

To keep animals out  
so they don't poo in the water, make the  
water muddy or chase wetland birds.



Can you see.....  
damsel flies  
(or dragonflies)?

They are a sign your water is  
cool and healthy!



Can you see..  
reeds and rushes?

Places to hide for insects,  
fish and Bittern!



Get a bit closer

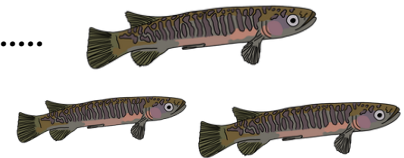
Can you see..  
the bottom?

If you can see  
through the water to the  
bottom, it means it's clear!  
Bittern can hunt here.



Can you see.....  
small fish?

They help feed bigger fish,  
eels and birds like Bittern!



Can you see.....  
midge larvae?

They help break down rotten  
leaves and feed the fish!



Does it smell like.....  
rotten eggs?

It doesn't have enough  
oxygen for insects & fish  
to live here.



Does it feel.....  
slimy & sludgy?

Most insect larvae, fish or  
koura don't like to live here.

