Saltwater crocodile

Crocodylus porosus

Student task

PAWSEY supercomputing centre

DIGITAL TECHNOLOGIES HUB

WESTERN AUSTRALIAN MARINE SCIENCE INSTITUTION

DILEMMA

Should crocodile trophy hunting be permitted in the Kimberley?

DID YOU KNOW?

1. Before 1970, saltwater crocodiles were hunted.

2. Crocodile numbers in the wild fell dramatically.

3. Since 1970, the saltwater crocodile has been protected in Australia.

WHAT IS TROPHY HUNTING?

Trophy hunting of crocodiles is when hunters pay to shoot saltwater crocodiles.

The proposal would be as part of a plan to control crocodile numbers.

Those in favour, argue trophy hunting would protect local livestock, fund conservation and boost the recreational fishing and tourism sectors. Others say it will do little to improve safety for the general public.

Who are the key people who have an interest in this issue?

What are their views?

CROC INQUIRY

IF TROPHY HUNTING WAS PERMITTED THERE WOULD BE MANY QUESTIONS TO CONSIDER.

HOW MANY PERMITS?

WOULD THERE BE SIZE RESTRICTIONS?

WHAT AREAS?

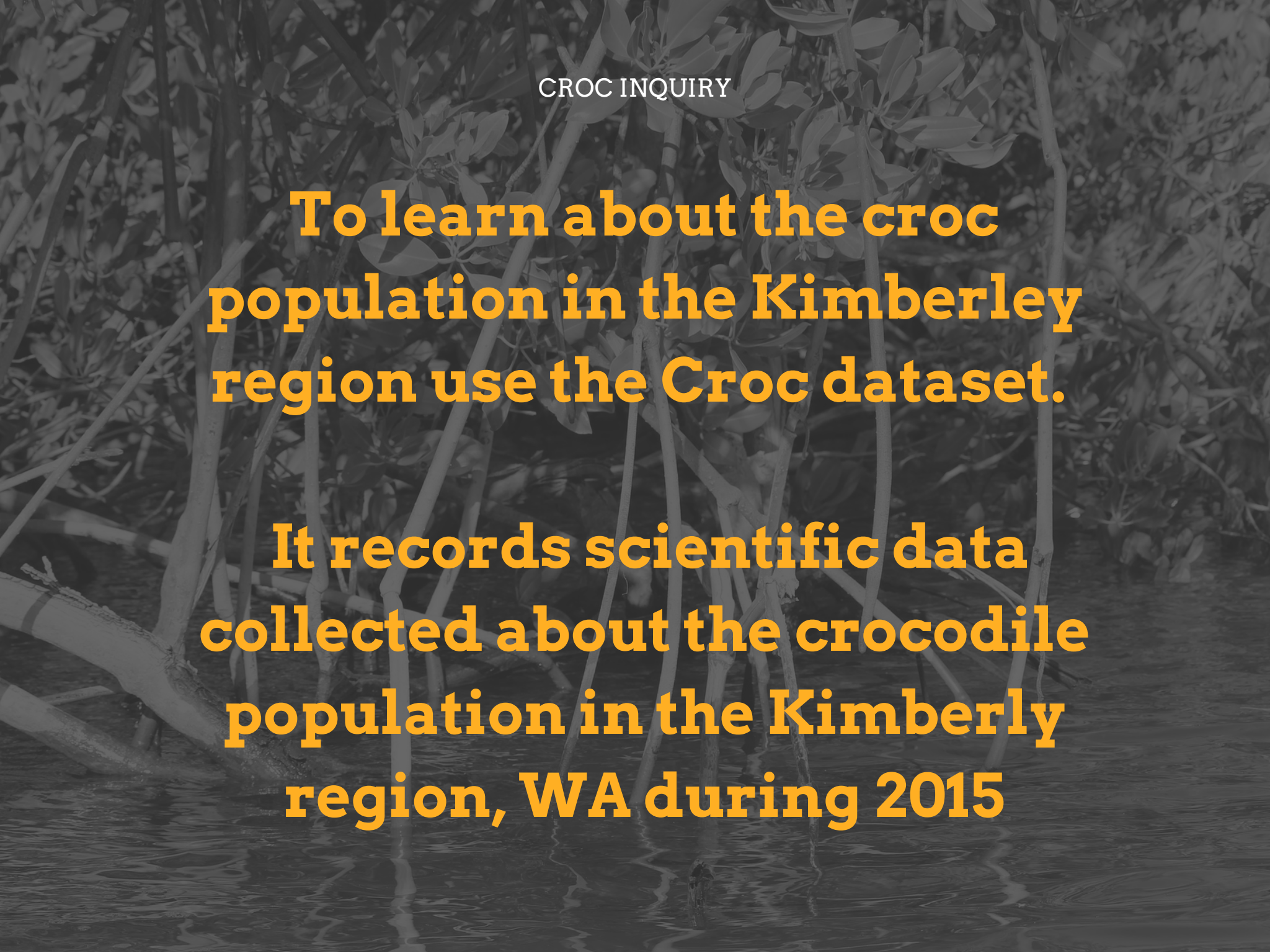
HOW WOULD IT BE MANAGED?

WOULD IT BE ONLY AT CERTAIN TIMES OF THE YEAR?

DO SOME RESEARCH:

Open the links to these websites.

- This *ABC Science article* provides some useful information, Crocs get it on.
- Animal fact sheet, *Australian Museum: Estuarine Crocodile.*
- This *ABC News article* discusses conservation management, NT crocodile harvesting a 'world-leading' model for helping poor communities via conservation



CROC INQUIRY

To learn about the croc population in the Kimberley region use the Croc dataset.

It records scientific data collected about the crocodile population in the Kimberly region, WA during 2015

A BIT ABOUT THE DATASET

Surveys are conducted by boat travelling upstream at night when most crocs are on shore or relatively stationary.

At night crocodiles' eyes reflect torchlight. Spotters estimate the length of croc and record its position using GPS. However, Eyeshine (EO) is recorded when only the eyes are spotted and an estimate of length cannot be made.

A crocodile should only be counted once in the survey. Based on the speed of the vessel, direction of travel and that it’s at night time, it’s unlikely crocs would be moving around and past the vessel and counted more than once (though not impossible).

CROC INQUIRY

Landscape	Region	Length (m)	Time
shallow_water_on_edge	Roe_Hunter	4.27	9:14 PM
shallow_water_on_edge	Roe_Hunter	4.27	9:17 PM
midstream	Roe_Hunter	3.96	6:32 PM
midstream	Prince_Regent	3.66	11:04 PM
shallow_water_on_edge	Roe_Hunter	3.66	11:07 PM
shallow_water_on_edge	Roe_Hunter	3.66	11:52 PM

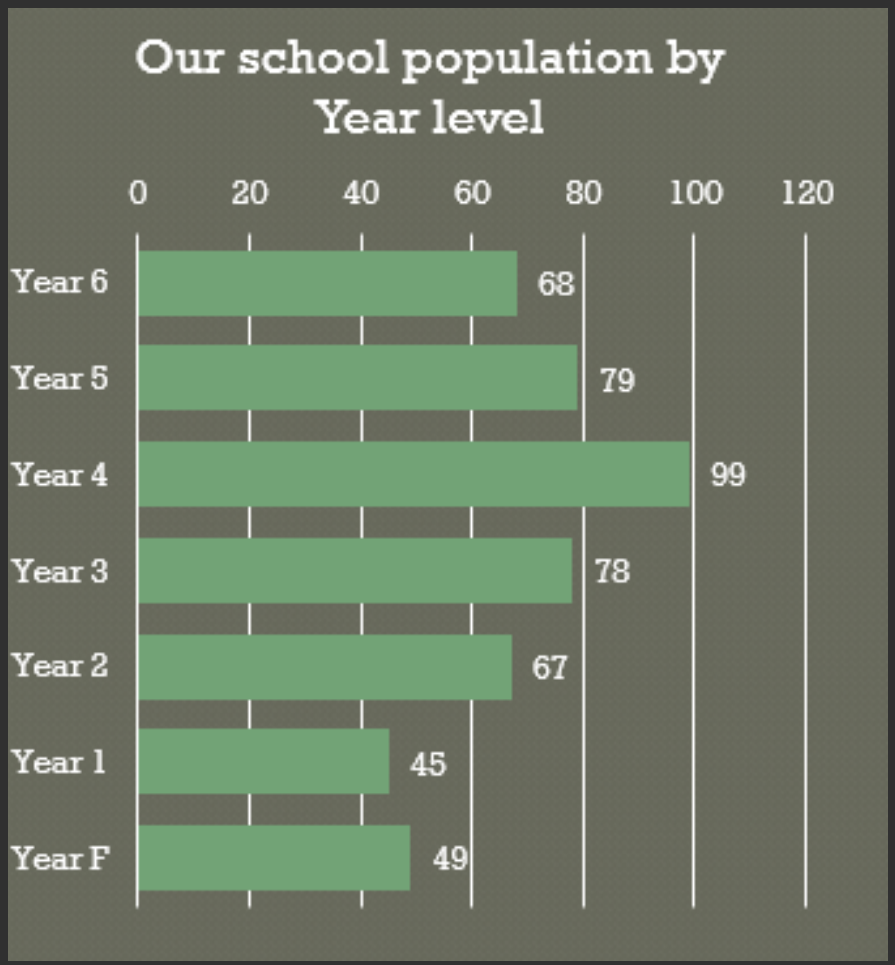
How might size restriction be decided?

Sort the spreadsheet by the column that contains data about length (m). If you order largest to smallest this may help to work out crocodile size.

What other ways can you sort the data?

CROC INQUIRY

You can show data about a population in a bar graph.



Use the data to create a croc population bar graph.

What is the structure of the crocodile population? - How many crocs at each size (m)?

What does the spread of size of crocodiles tell you about the population?

What is the age structure of the crocodile population?

Age	Size (m)
Hatchlings	up to 0.6m
Juveniles	> 0.6 up to 1.5m
Young adult	> 1.5 up to 2.1m
Adult	> 2.1m

Scientists describe the age of a crocodile when estimating its length.

Use the table to help you sort the dataset.

What does the data tell you about the crocodile population?

What age crocodiles do you need to have a sustainable population?

CROC INQUIRY

How well is the population recovering after the nearly 5 decades of being protected?

Crocodiles by size, sighted in Prince Regent River system during two studies (1978 and 1985)		
Size (m)	1978	1986
up to 0.6m	56	5
> 0.6 up to 0.9m	14	12
> 0.9 up to 1.2 m	18	26
> 1.2 up to 1.5m	24	29
> 1.5 up to 1.8m	20	29
> 1.8 up to 2.1m	20	55
> 2.1m	31	62
Eyeshine (EO)	6	29
TOTAL	189	247

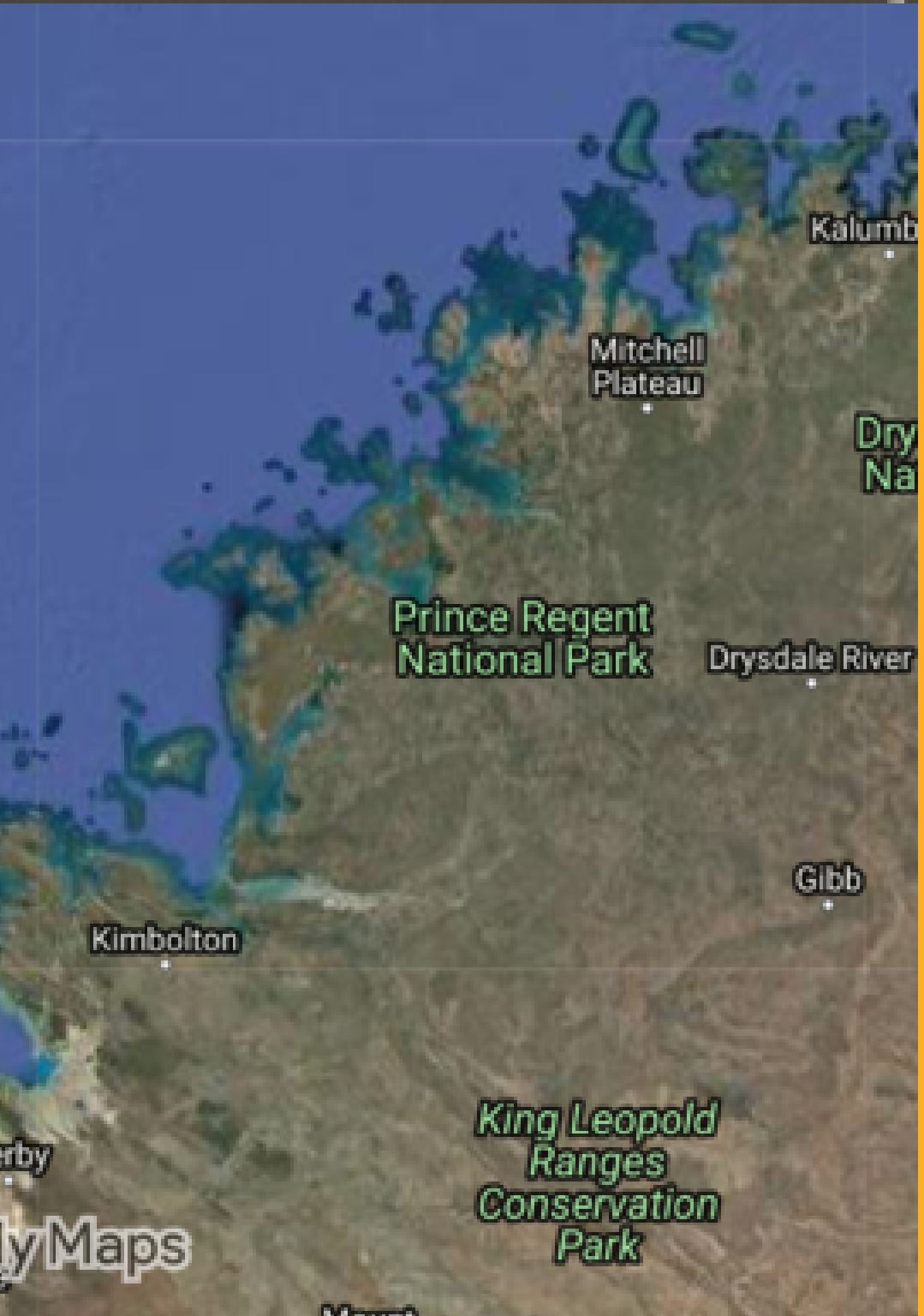
Compare the 2015 data to the two previous surveys in 1978 and 1986.

Create the same table and add the 2015 data for each row.

Create a chart to visually display the data.

What does the data suggest? How well has the population recovered?

How might trophy hunting affect the population?

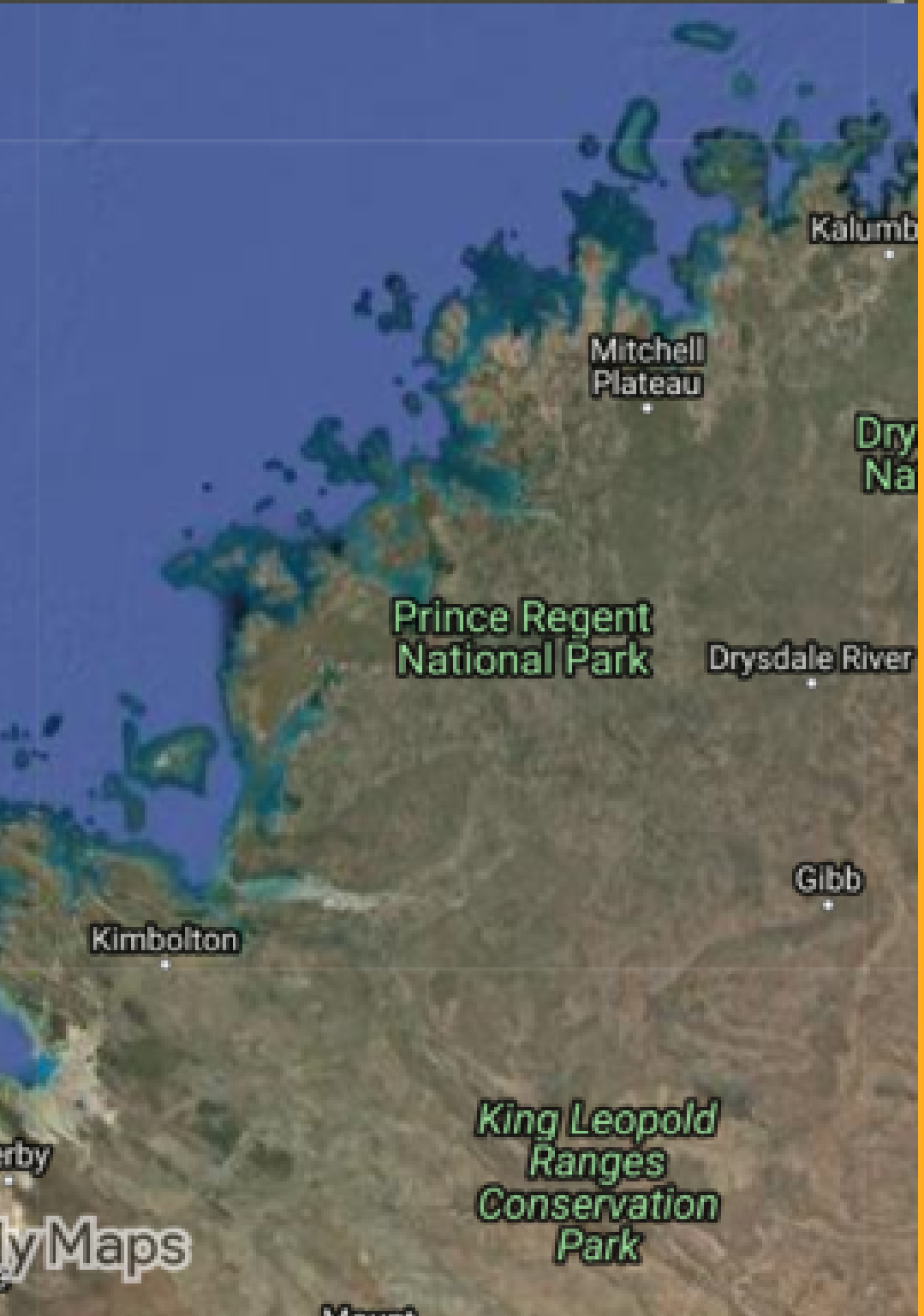


MAPPING THE POPULATION

1. Where in the Kimberley region were the crocodiles sighted?

2. What is the distribution of the population?

3. Use the latitude and longitude data to plot each croc's position on an online map. You can use online mapping software such as My maps in Google maps.



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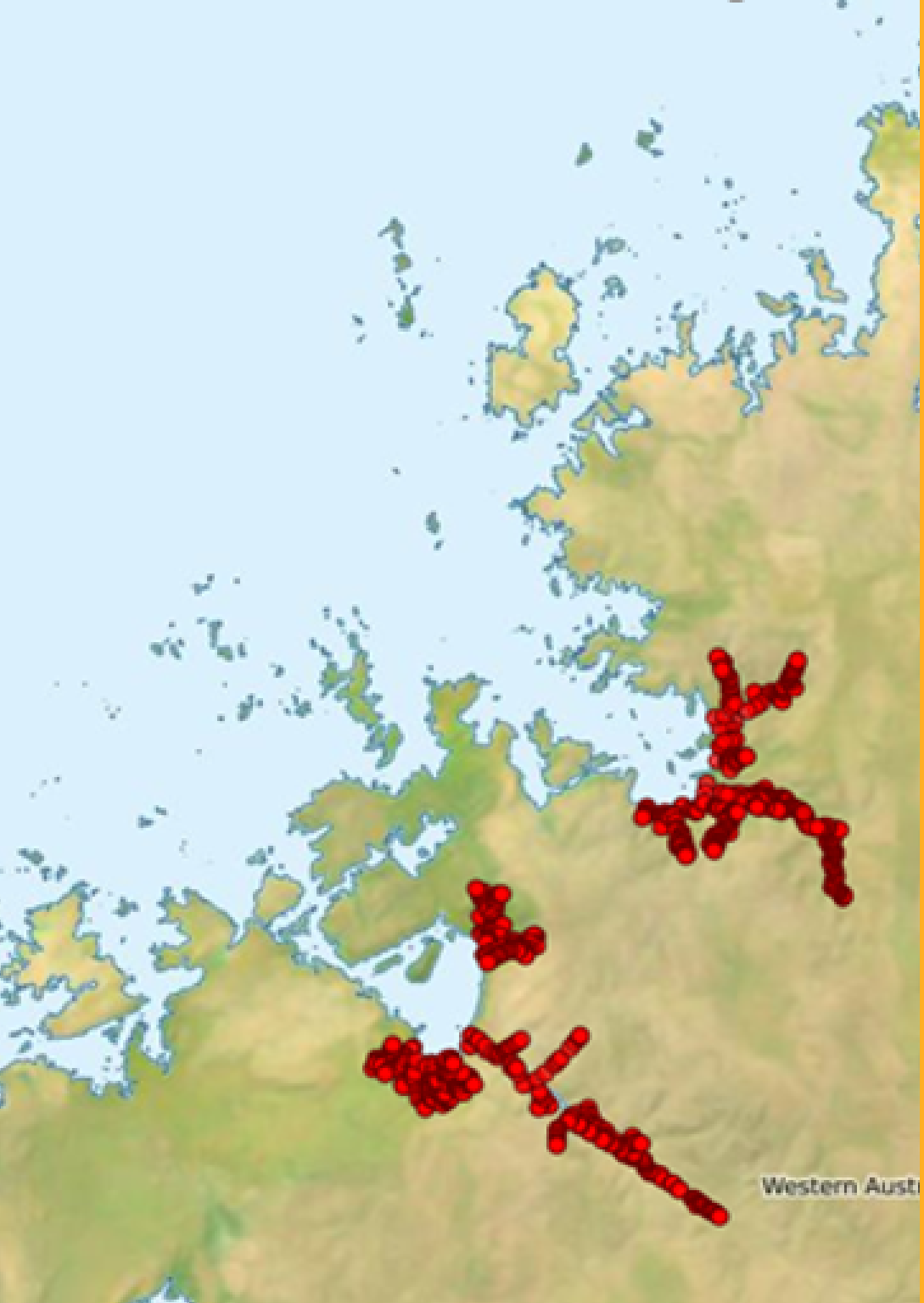

TRADITIONAL OWNERS

1. Open this link to crocodile data plotted on an online map: Northwest atlas.

2. Add Overlay layers (by selecting the green '+' icon and searching for the following):
- Indigenous Land Use Agreements 2017
- Indigenous Protected Areas 2017

3. How might Traditional land ownership influence management of this crocodile population?

A BILL BEFORE PARLIAMENT

In Parliament, a bill is a proposal for a new law or a change to an existing one. If it is passed by the Parliament, it becomes a law, also known as an Act of Parliament.

A bill could be proposed that crocodile trophy hunting be permitted in the Kimberley region of WA.

Use your data analysis and other research to present your proposal either opposing or supporting the bill.

Provide a 1-2 min video, brief report or infographic to support your team's view. Use these resources to lobby for support from your audience.

CONSIDER

In your argument, think about:

What might be the benefits and risks of introducing trophy hunting?

What might be the benefits and risks of NOT introducing trophy hunting?

For your position, how would you deal with risks?

Which stakeholders would support your position?

Be prepared to argue your point of view against others in your class.

CROC INQUIRY

HOW WILL I BE ASSESSED?

Use this rubric to help you and your team self-assess your work on the proposal.

Proposal: for or against croc trophy hunting bill	*1*	*2*	*3*	*4*
Planned our information search (ICT Capability)	*I didn't make a plan for our information search.*	*I helped make a written plan for our information search.*	*I helped create and complete a table using ICT to plan our information search*	*I helped develop a creative way to plan our information search using ICT*
Research into saltwater crocodiles (ICT Capability)	*I didn't use any references.*	*I viewed up to three references and recorded brief notes.*	*I viewed up to three references and recorded notes in a table to organise the information.*	*I viewed more than three references and recorded detailed notes in a table to organise the information.*

CROC INQUIRY

Proposal: for or against croc trophy hunting bill	*1*	*2*	*3*	*4*
Indigenous perspective ***(Cross-curriculum priorities)***	*I didn't include views of traditional owners.*	*I considered the views of traditional owners when developing the proposal.*	*I considered the views of traditional owners when developing the proposal and found out the Aboriginal communities that live in the region.*	*I considered the views of traditional owners and incorporated the Aboriginal communities that live in the region in developing the proposal.*
Science ***(Biological science)***	*I did not use scientific ideas.*	*I considered ways crocodiles have adopted to survive in their environment.*	*I considered ways crocodiles have adopted to their environment and the conditions they need to grow and survive.*	*I considered ways crocodiles have adopted to their environment, the conditions they need to grow and survive and how to ensure the population continues to be sustainable.*

CROC INQUIRY

Proposal: for or against croc trophy hunting bill	*1*	*2*	*3*	*4*
Crocodile dataset and using a spreadsheet ***(Digital Technologies)***	*I didn't use the crocodile dataset.*	*I sorted the crocodile datoset to help answer a question.* *I created a chart to present the data visually.* *I was able to draw conclusions from the data and create information used in the proposal.*	*I sorted the crocodile datoset to help answer questions.* *I created charts to present the data visually.* *I was able to draw conclusions from the data and create information used in the proposal.*	*I sorted and filtered the crocodile datoset in multiple ways to help answer questions.* *I created charts to present the data visually including using online mapping software to create an online map of the data.* *I was able to draw conclusions from the data and create information used in the proposal.*

ACKNOWLEDGEMENTS

This resource was developed through a collaboration between:

Digital Technologies Hub, ESA
PAWSEY Supercomputing Centre, WA
The Western Australian Marine Science Institution, (WAMSI)

PIXABAY images
https://pixabay.com/photos/saltwater-crocodile-australian-3463562/
https://pixabay.com/photos/crocodile-salt-water-crocodile-1091864/
https://pixabay.com/photos/crocodile-salt-water-australian-824514/
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