

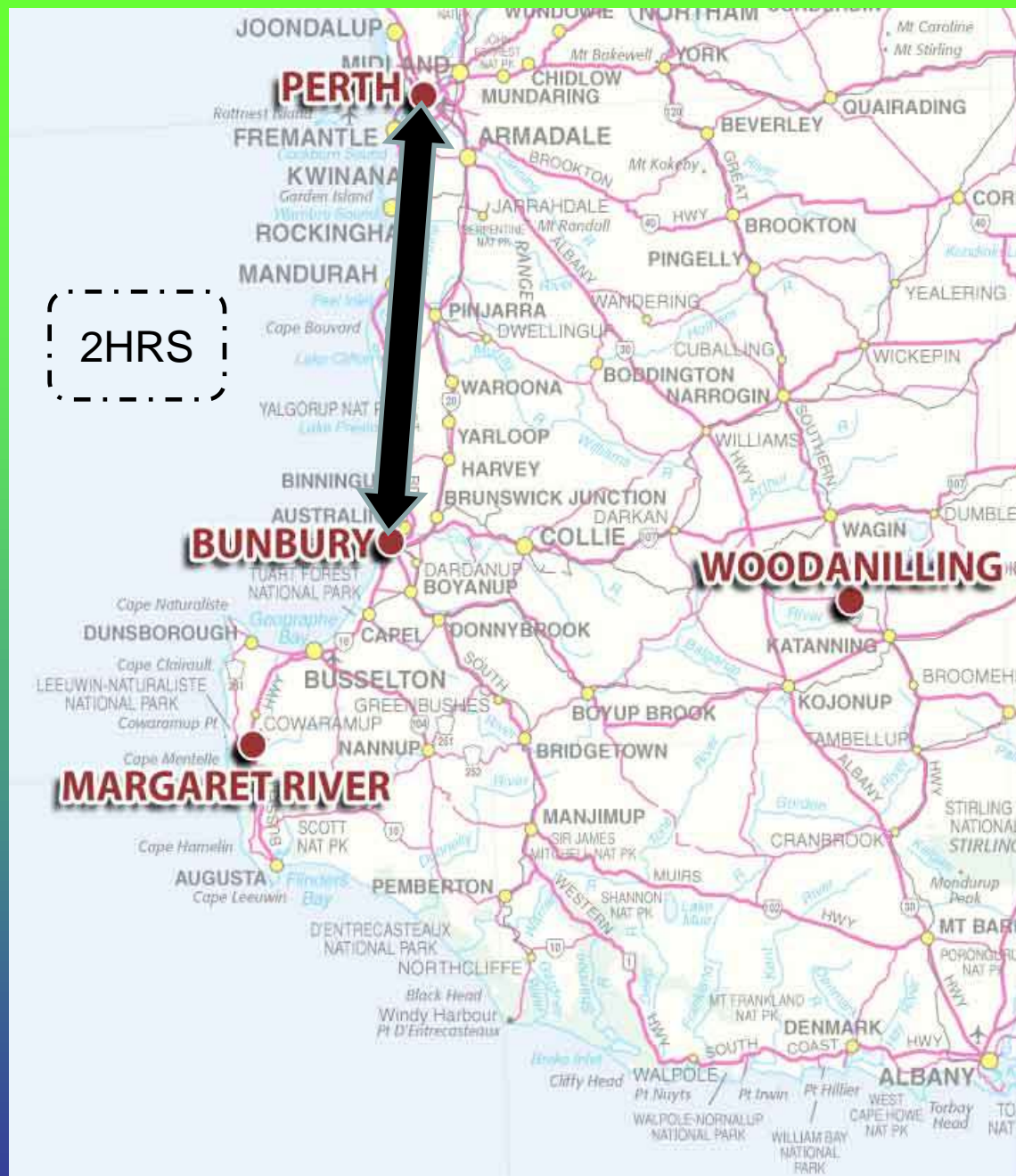
Newton Moore SHS

Marine Managers

Managing the South West!







This is were we work!!!!



Dolphin
Discovery Centre

As you can see... we recycle!





WHY?

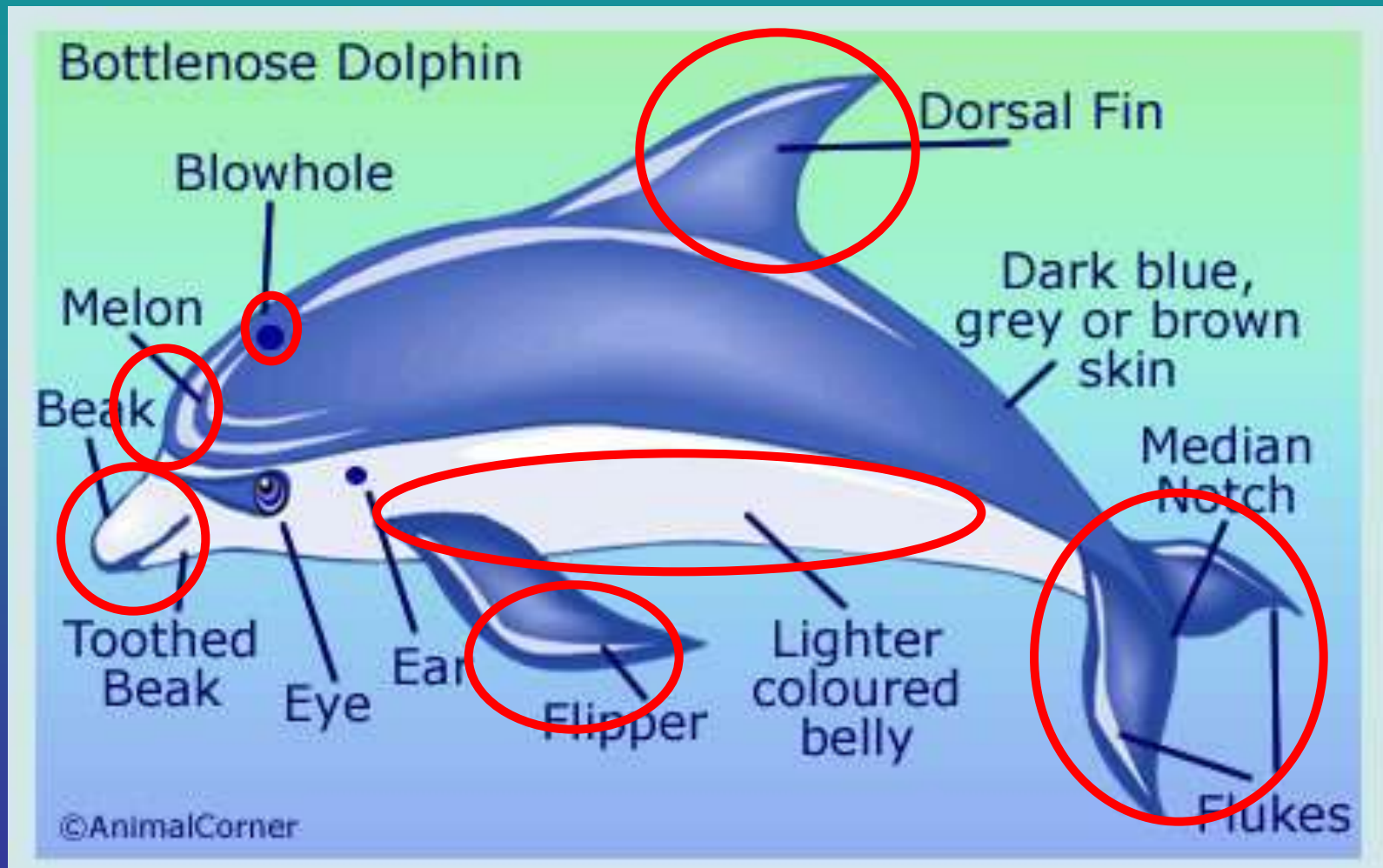
Courtesy of the Dolphin Discovery Centre

To provide information which is of significance to our understanding of the ecology of dolphins and to their future conservation and management,

To develop recommendations pertaining to human disturbance on the dolphin population so that impacts are minimised which will help ensure the sustainability of the dolphin watching experience in Bunbury, and

To build Bunbury Dolphin Discovery into a nationally and internationally recognised dolphin research centre that excels in scientifically rigorous marine research.

Bottlenose Dolphin



Koombana Bay Dolphin Survey

Use the attached map to give grid references for the location of the dolphins sighted in Koombana Bay.

Students: _____ Date: _____

Weather conditions: _____

Sea Conditions: _____

Name of vessel: _____ Skipper: _____

Population and Behaviour Grid

Use the following abbreviations for the behaviours you observe:

SH = Spy hopping B = Breaching BW = bow wave riding WL = Wave Leaping P = Porpoising

M = mouthing L = Logging TS = Tail slapping U = Upside down C = Chuffing



Time (24hr Clock)	Grid Reference	GPS Reference	Behaviour	Remarks



The Surveying

YOUR NAME

DATE

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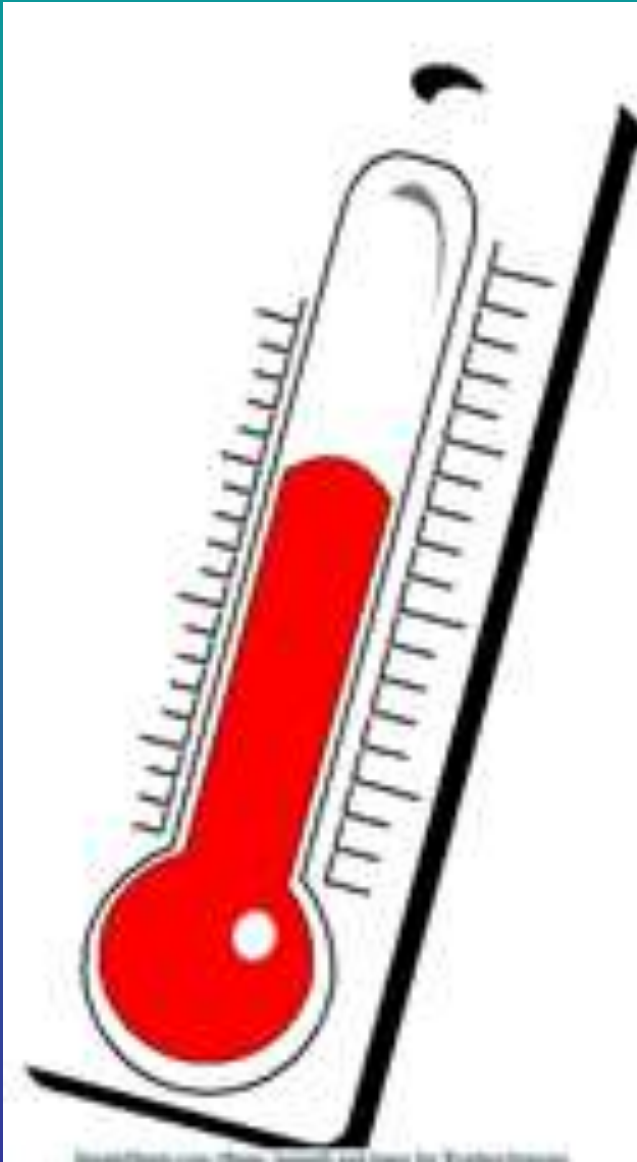
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25°C

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© Photo by Dave & Fiona Harvey - Volunteers - Dolphin Discovery Centre, Sardinia, WA.

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Skipper Ben



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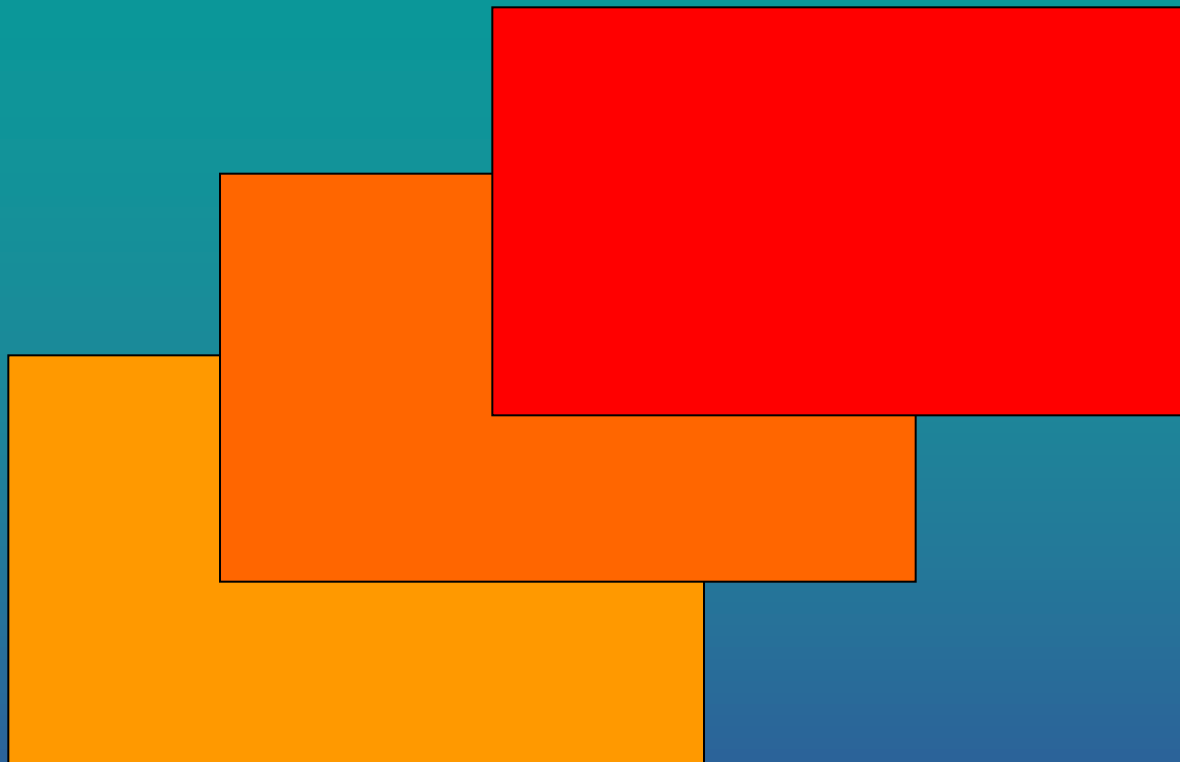





*Sickness bag
Spuckbeutel
Sac vomitoire
Bulantı torbası*







Dolphin behaviors'



Spy Hopping
Breaching
Mouthing
Logging
Porpoising
Chuffing
Tail slapping
Bow riding and Wave
leaping

spy hopping

Spy hopping involves the dolphin lifting its head out of the water to look around.

The dolphin shoots up then goes straight back down in a continuous motion.

It is thought that this might be to locate flocks of birds near the water which often indicates the presence of fish



Breaching



Breaching is when a dolphin jumps out of the water and lands on its side or back to create a splash. Some have been seen to jump as high as 5m out of the water!

There are several explanations for breaching: it could be used to demonstrate strength or aggression, to dislodge skin parasites, or to communicate visually or acoustically. However, as with bow-riding, it often seems that dolphins breach for the fun of it.

mouththing



Mouthing is when a dolphin opens and closes its mouth when swimming up near humans.

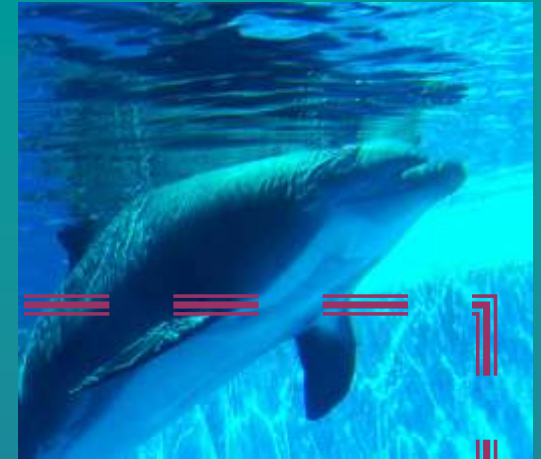
Remember:

Dolphins do not make sounds when they are out of the water as they pass all of their air out through their blow hole.





logging

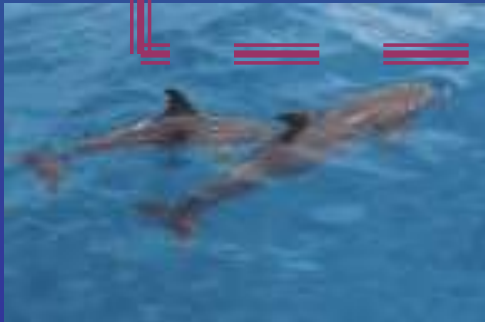


When a dolphin floats motionless at the surface of the water, this is known as logging.

Large groups of dolphins may rest together like this, usually all facing in the same direction.

Remember that dolphins are conscious breathers and to sleep their blowhole must be at the surface.

By logging dolphins are able to take short 30 second sleeps!



Porpoising

When dolphins swim rapidly at the surface, leaping out of the water in a low arc each time they take a breath, this is known as **porpoising**. Porpoising is an energy-efficient method of travel because air offers much less resistance to movement than water, so the animal uses the momentum it has built up underwater to travel much further when it breaks the surface. This behaviour is often seen when dolphins are bow-riding.



Chuffing



Chuffing occurs when the dolphin comes to the surface and exhales loudly from its blow hole, spraying bubbles and water from their blow hole



Tail slapping



- Tail slapping is an aggressive behaviour where a dolphin lies on its side (or face down) and slaps its tail very hard against the water's edge.



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GoldenStateImages.com (C) Randy Morse

bow riding and wave leaping



Dolphins will purposefully position themselves in front of a fast moving boat so they can ride the pressure wave created by the movement.

This is known as **bow riding**.

The force of the bow wave pushes the dolphin through the water and so conserves energy.

When the dolphins swim in the waves or the wake behind a fast moving boat or whale, or the their mothers slim stream they are pushed along by the pressure of the wave.

This is known as **Wave leaping**.



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Time (24hr Clock)	Grid Reference	GPS Reference	Behaviour	Remarks
10.00am	M 10			



CHUFFING



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Time (24hr Clock)	Grid Reference	GPS Reference	Behaviour	Remarks
10.00am	M 10		Chuffing	



Spy Hopping



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Time (24hr Clock)	Grid Reference	GPS Reference	Behaviour	Remarks
10.00am	M 10		Chuffing, spy hopping	



Bow Riding



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Time (24hr Clock)	Grid Reference	GPS Reference	Behaviour	Remarks
10.00am	M 10		Chuffing, spy hopping and bow riding	



Dolphin Fins



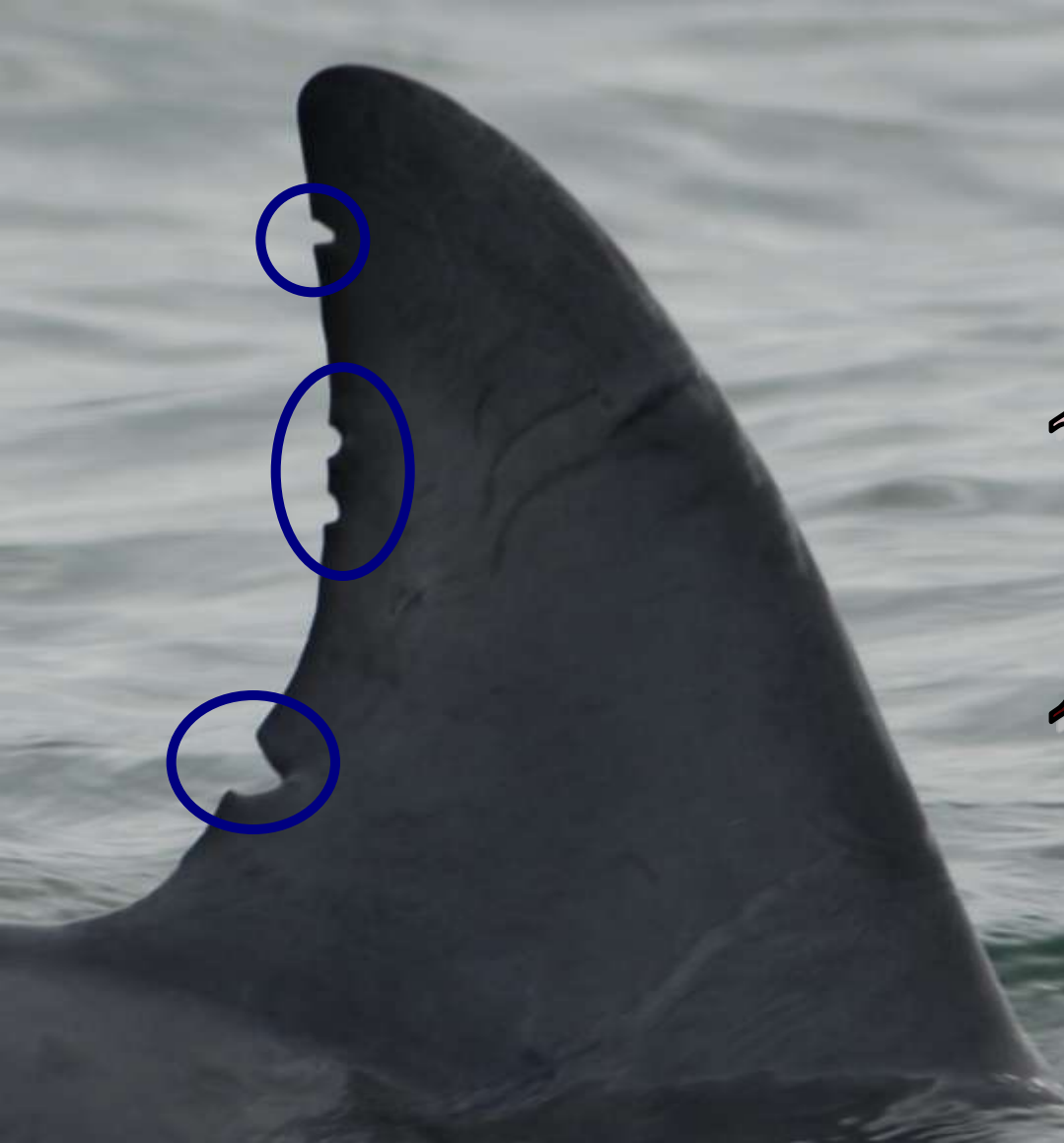
Anchor



Big Nick



Chopper



Ladder



Nicky



Stencil

AN EXAMPLE

Population Behaviour grid

Date: 22nd October 2009

Time (24 hr clock)	Grid Reference	No of Dolphins	Behaviour	Remarks/ Identification
10.00am	M 10	5	Milling	Lunchbox, Flattop, Esky, Popper, Buzz
10.20 am	K 13	4	Resting: Razor, Foal, Fuji, Star	Razor, Foal, Fuji, Star. A male alliance group
10.23 am	K 11	3		Stencil, Hockey, Cozy, Fence Male alliance group
10.25 am	J 10	10	Travelling west	
10.45 am	J 8	7	Resting, Milling	Bumby, 2 calves Maternal mother with calf & juvenile.
10.50 am	N 9	10	Socializing, Mingling	calves playing Mothers with calves No males
10.55.am	N 10	19	Milling	Face, Chocolate, Fishbone, Osho, Nemo
	Approx TOTAL	60 - 70		

AN EXAMPLE
Population Behaviour grid
Date: 18th May 2010

Time (24 hr clock)	Grid Reference	No of Dolphins	Behaviour	Remarks/ Identification
13.33	E15	10	Resting, logging, with shanty	Calypso, Double dip
			Resting, logging, with calypso	Shanty, Nibbles/Comet, Anchor
			Resting, logging, with shanty	
13.49	Middle of bay	10	8 dolphins, resting, maternal group, with Fence, Boomer	
14.55	D7	4	Deep dive, with calf ,fluke dive	Tangles, Bliss
	Approx TOTAL	30		

KOOKMBANA BAY - Water Testing Results Log											
LOCATION	PERS ON	DATE	WEATHER	SWELL	SE AS	AIR TEMP (°C)	TURBI DITY (m)	pH	WAT ER TEM P (°C)	SALIN ITY ppk	CONDUCTIVI TY (ms)
MINERAL SANDS JETTY	LLOY D	06/05/2009	FINE	LOW ~1.5m	FLA T	24	3	8.1	18.1	>2000	>2000
OCEAN							4.5	8.14	18.9	>2000	>2000
CUT							3.5	8.15	19	>2000	>2000
MIIDDLE BAY							4.5	8.14	18.8	>2000	>2000
MINERAL SANDS JETTY	HILLI ER	22/10/09	FINE								
OCEAN											
CUT							2.5	7.45	18.5	3.22	
MIIDDLE BAY							2.5	7.45	18.3	3.24	
MINERAL SANDS JETTY	LLOY D	02/11/09	Fine, Windy	Low - 0.3m	FLA T	18.7/16.5 no wind					
OCEAN							2.5m	7.64	18.8	3.24	
CUT							3m	7.52	19.4	3.1	
MIIDDLE BAY							1.1m	7.66	18.5	3.22	
MINERAL SANDS JETTY	H-Saunders	4/03/2010	Overcast, Slightly Windy			20.2					
OCEAN							10m	7.78	21.8	3.21	
CUT							5m	7.75	22.1	3.26	
MIIDDLE BAY							2m	7.78	22.4	3.26	
MINERAL SANDS JETTY	H-Saunders	22/09/2010	Sunny, Calm, Warm	LOW- 0.2m	FLA T						
OCEAN							5m	9.66	16.84		
CUT							3m	9.18	16.8		
MIIDDLE BAY							4m	9.11	16.7		

Conclusion of Dolphin Research

...still early days

- Over 100 dolphins were sighted from our excursions so far. Groups included adult male alliances, juvenile alliances, mothers and babies.
- The fact males formed an alliance made it helpful when identifying the dolphins as they seem to stay together as a particular group.

- Data shows that just North of the cut was a popular location for the dolphins. Many are also sighted at the outer harbour entrance, presumably feeding on herring.

TRANSPORT GOOD OR BAD?

- As ships move through the channel, the sediments become stirred up, attracting herring and in turn the dolphins.
- Too many ships and other boating traffic?

Where do the patterns lie?

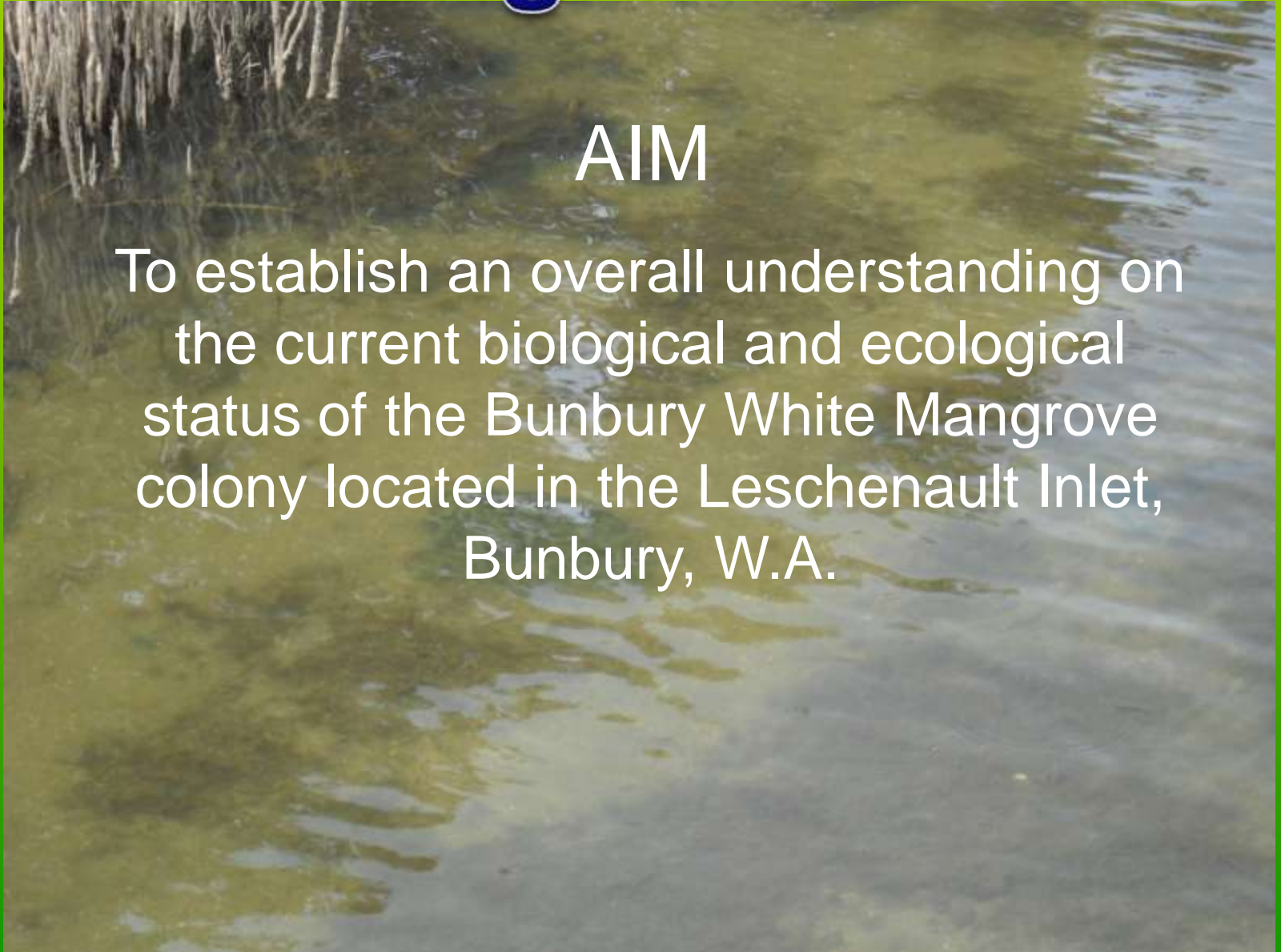
What are we looking to compare when we collect more than 2 years data?

- Time of year
- Location in Bay
- Year to year changes

Mangroves

AIM

To establish an overall understanding on the current biological and ecological status of the Bunbury White Mangrove colony located in the Leschenault Inlet, Bunbury, W.A.





HOW???



By using scientific and investigative strategies as a means of collecting data for habitat assessment and future management decisions.











macro invertebrate

Shrimp

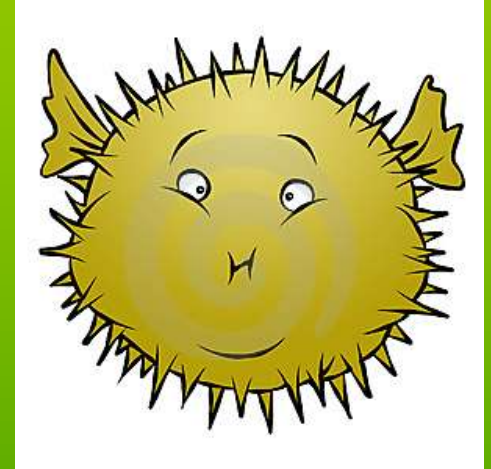


mayfly



(Ephemeroptera)

Blowfish



Minnows



Water Bugs



Hemiptera

BEETLES



Coleoptera

Damsel and Dragonflies



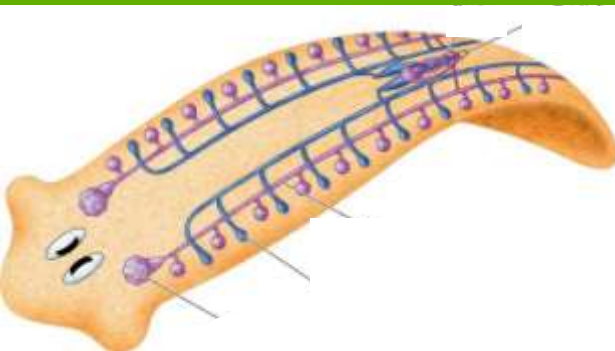
Water Mites



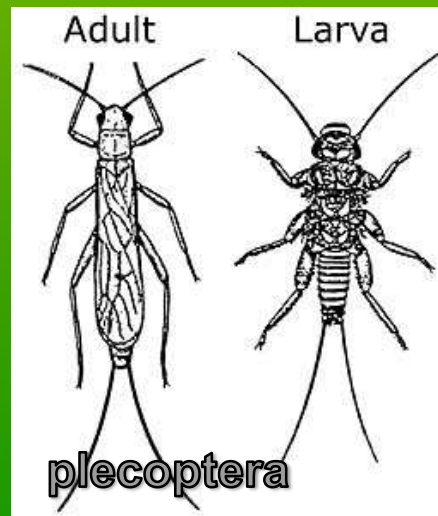
Flies or midgies



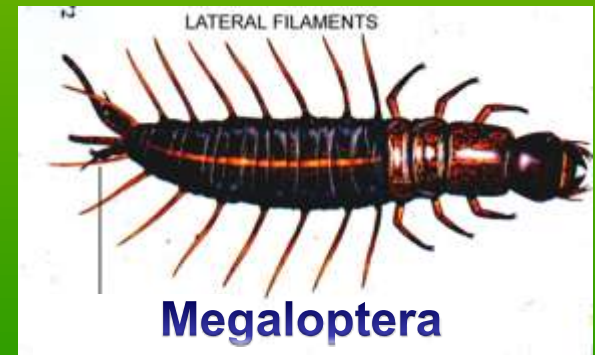
Flatworms



Stoneflies



Dobson flies



CNIDARIA

Moon Jellyfish

(*Aurelia aurita*)

What do we look for?



MOLLUSCA

(Bivalvia Mactridae)

What do we look for?



CRUSTACEA

Estuary shrimp

(*Malacostraca*
Palaemonetes)

What do we look for?



ECHINODERMATA

Brittle star

What do we look for?



Macro Heads



CNIDARIA
Moon Jellyfish



CRUSTACEA

Estuary
shrimp



MOLLUSCA
Bivalve



ECHINODERMATA
Brittle star

Macro invertebrates Identified to date:

Crustacea	Mollusca	Cnidera	Echinodermata
Amphipoda Tanais sp	Gastropoda Whelks	Jellyfish	Brittle star fish
Amphipoda Melita matilda	Bivalvia Mactridae (trough shells)		
Malacostraca Palaemonetes australis (estuary shrimp)			
Malacostraca Palaemonetes decapoda (hermit crab)			
Cirripedia (barnacle)			
Diogenidae			

Conclusion of Mangrove Research

- The biodiversity found from sampling the mangroves was encouraging with at least 15 species identified.
- This data will help form the basis of a sensitivity index on estuarine macro invertebrates which can later be used to determine the health of mangrove and estuary to make recommendations for the management.

MARINE MANAGERS TO THE RESCUE



Preston River!!!









