WESTERN AUSTRALIAN MARINE TURTLE PROJECT

c/- Dr R I T PRINCE ▪ WILDLIFE RESEARCH CENTRE ▪ CALM
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TAKING PHOTOGRAPHS TO CONFIRM SEA TURTLE IDENTIFICATIONS

The key to the live adult turtles provided in the project leaflet should be fairly straightforward to use. **However**, it is desirable to confirm diagnoses of the uncommon species, perhaps being seen by you for the first time, and particularly in places where occurrence of the species has not previously been recorded.

Real specimens are the best museum vouchers, but, in the case of large animals like marine turtles, collections are not usually practicable. A good series of photographs clearly showing identifiable characteristics is the next best thing to obtain.

If you have a camera with flash attachment in particular, **the series of photographs to take** includes:

1) A close-up of the head taken from forward and above to clearly show the prefrontal scale pattern (on top between nostrils and eyes).

2) A fairly-full frame photo of the shell (carapace) taken from above to one side clearly showing the costal scale pattern.

In addition to the above two, which are essentials:

3) A photo of the whole animal from one side, fairly full frame;

4) A photo from the rear and above of the shell which shows general relationships of the main scales;

5) A side shot of the head showing the scale pattern around the eye;

6) A photo of the extended foreflipper, upper surface;

7) A photo of the underside of the whole animal.

Because photos will be required for retention it is best to take at least two of each particular photo as specified. This is preferable to making extra prints from single negatives after initial film processing.

Recognition for photos retained will be ensured. Please attach suitable documentation of time and place, etc

WESTERN AUSTRALIAN MARINE TURTLE PROJECT

SUPPORTED BY

AUSTRALIAN NATURE CONSERVATION AUTHORITY
STATES COOPERATIVE ASSISTANCE PROJECT 4458

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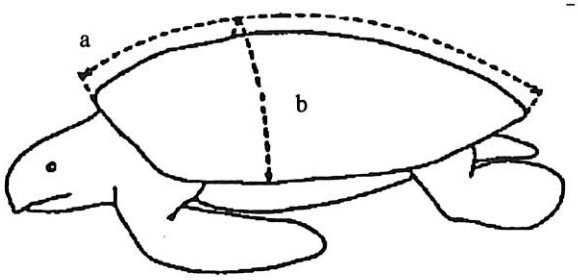
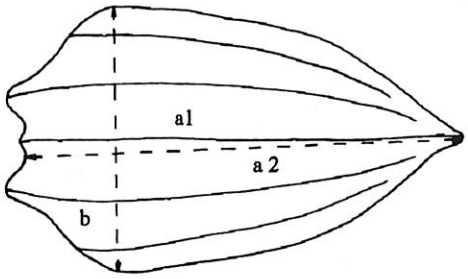
LINEAR MEASUREMENT OF SEA TURTLES

The standard measurements of sea turtles are usually made on the carapace (dorsal shell; back). While slightly different measurement methods have been used by various researchers, the following methods in standard use within the Queensland Turtle Research Project have been adopted for use in the Western Australian Marine Turtle Project.

Adult and immature turtles:



Hard-shelled



Leatherback

Curved carapace measurements:

Made using a flexible fibreglass tape measure (to ± 0.5 cm; 5 mm) laid over the curve of the shell. **Please remove** any large barnacles obscuring a measurement.

a. **Curved carapace length (CCL):** Measured in hard-shelled turtles along the midline from the junction of the skin and carapace above the neck to the posterior edge of the junction of the post-central scales. If there is a notch along this junction of the post-central scales then the CCL measurement is made to the anterior edge of the notch, always measuring along the midline of the carapace. With Hawksbill turtles only, the length of the "V" of this elongated notch is also measured.

Leatherback turtles must be measured along the midline ridge to the tip of the posterior projection of the carapace, and from the closest edge of the trough beside the midline ridge to the tip.

b. **Curved carapace width (CCW):** Measured perpendicularly to the midline axis of the carapace between the outer extremities of the marginal scales. When making this measurement, repeat it at several positions to obtain the greatest value. For turtles having a carapace that is reflexed upwards near the marginal scales (especially flatback turtles) this measurement is made with the tape measure stretched tightly between the outer extremities of the marginal scales, i.e. it is not in contact with the surface of the carapace for the full width.

Leatherback turtles are measured to the lateral ridge on each side (third from midline).

N.B. - The calibration of fibreglass tape measures should be checked regularly against either steel or boxwood rules

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RETAGGING OF PREVIOUSLY TAGGED TURTLES

[REMIGRANTS AT WESTERN AUSTRALIAN ROOKERIES]

Turtles first tagged in the 1986/87 season and later are now regularly reappearing at Western Australian rookeries. These turtles are referred to as 'remigrants'.

Some of least of these remigrant turtles will now have tags that are insecurely attached. These old tags clearly have a much increased risk of loss in the near future.

Some previously double-tagged animals will also be seen to have lost a tag. Careful close inspection of other turtles on the beaches may also reveal some that were previously tagged, but have lost their tag(s), and are now thus individually unidentifiable.

Identifiable animals with a past history are of prime value for our project, so **it is most important that these turtles remain so** in the future.

Retagging, by *either* adding to existing tags *or* replacing those previously lost is essential.

On the beaches you may see first time remigrant turtles, or turtles on their second or later remigration. Tag observations made may be as follows:

i) Double-tagged initially, with both tags remaining, but one or both tags insecure due to proximity to edge of flipper. This can be due to either poor placement initially, to a growth/rejection response of the turtle resulting in the point of tag attachment migrating towards the flipper edge, thus carrying the tag along, or to some other cause (eg, heavy fouling by barnacles, etc.; titanium tags have no anti-fouling capacity).

ii) Double-tagged initially, but has lost a tag, and with the remaining tag either vulnerable to loss, or perhaps still secure.

iii) Single-tagged initially, with tag either secure or not.

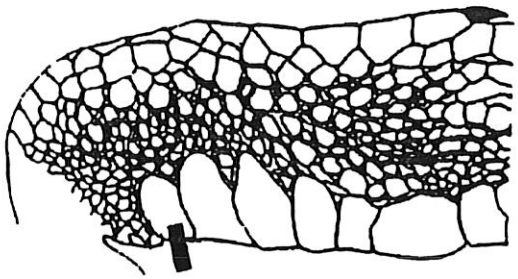
iv) More than two tags, with different tags being variably secure (as expected for multiple remigrants, or turtles already retagged within season).

ACTION REQUIRED: *PLEASE*

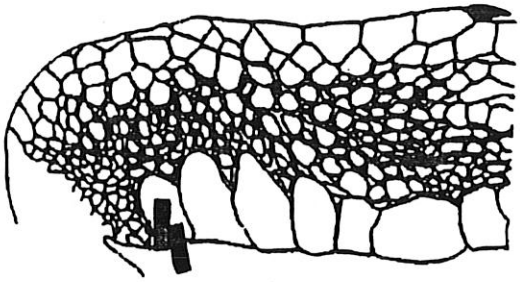
i) Put a new tag on in place of any tag that has been lost from a previously tagged turtle. Record as necessary on your tagging record sheet, with 'Notes' as applicable.

ii) Existing tags found to be only loosely attached, or that are now located too close to the edge of the flipper, should be noted as such on your record sheet, and, **whereever this is the case**, ***you must also*** **apply a new tag beside that tag** (see Example B, diagram below).

Please Note, when adding tags**:** The actual position of the point of attachment of the tag on the flipper is the most important factor affecting retention of tags. *IF* you have any difficulty in trying to put the new or extra tag into the preferred scale, as suggested by Example B, *THEN* please fix the tag to the soft part of the flipper on the body side of the original tagging scale whereever possible. Please take care to push the tag as far up onto the flipper as reasonably possible before you fix it - refer to Tagging instructions sheet.



Example A: Old Tag Very Near to Edge



Example B: New Tag (light shade), Applied Beside Old on Preferred Scale

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iii) If both tags are insecure on a double-tagged turtle, do each as recommended above. Record as required with 'Notes' on your tagging record sheet.

iv) If you find a single-tagged turtle that is obviously a seasonal remigrant, add a second (new) tag to the opposite flipper, and record on tagging record sheet as needed.

The existing tag on the turtle should also be dealt with as appropriate re suggestions i) to iii) above.

v) If you do find a turtle that clearly was tagged previously, but now has only tag attachment scars on the flippers, retag as per seasons' tagging instructions, and make the relevant 'Notes' as required. Also, please include a diagram on the record sheet so it will be clear how the tag loss status was determined and perhaps suggest why the tag may have been lost.

vi) Finally, ***please*** **remember to remeasure all these remigrant turtles when first seen.**

The remigrant turtles dealt with as per the instructions above may carry three, four, or in some cases, more tags. **All remigrants should carry a minimum of two securely fixed tags when released.**

Thank you for your care and attention in completing this work.

[TURTLE PROJECT • OCTOBER 1993]

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TAGGING MARINE TURTLES

NOTES FOR VOLUNTEER ASSISTANTS

Introduction

Most of this work will be done on beaches where the female marine turtles emerge to nest. These nesting turtles are most sensitive to disturbance when the urge to lay eggs forces them from the familiar ocean environment on to the beaches. It is therefore important to take the utmost care in the use of lights on the beach when working, and to also avoid excess noise and sudden movements as much as possible.

Turtles deciding whether to leave the water can easily be deterred, while those in the process of selecting and preparing a possible nest hole may abort the attempt. You will understand the need for these precautions once you have seen the amount of hard work required to be done by the turtles to complete a clutch of eggs.

Once fully engaged in egg laying, and for a short while after completion of actual laying, the turtles are least sensitive to light, gentle handling and noise. This is the best time to take measurements and apply the tags.

Noting the above cautions, there may be specific situations where a more target specific project goal requires a different approach to ensure that enough turtles can be tagged for initial identification. You will be advised where this is the case.

Sea turtles are however quite powerful, even if somewhat clumsy on land, so the combination of loose beach material and unrestrained thrashing of the turtle's fore-flippers poses a hazard to handlers if the animal does take fright, or does something for which you are not prepared. **For your safety,** we believe eye protection is essential, even if found a touch uncomfortable to wear! **Please wear the safety glasses provided!!**

Wearing of some reasonable footwear is also recommended. It could save your feet from injury on the beach, and from the effects of the occasional whack where contact is made by the nail on the flipper.

All turtles are also capable of biting, but it is the carnivorous species that tend to be a bit more aggressive when handled. Take care.

Tagging materials

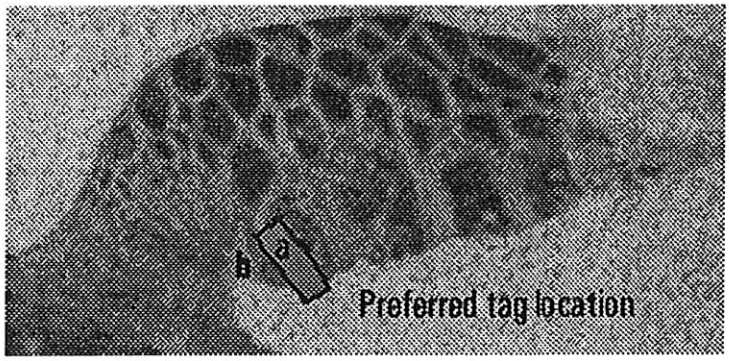
Tags are made from titanium metal, which is non-corrosible and tissue neutral. They are designed to be self-piercing, but **hand-made in final manufacture.** For this reason, **tags are not uniformly bent when received. Tips can also be out of alignment. This possibility must be checked,** and adjustments made as necessary, **when you prepare each tag for use**.

When properly set-up and positioned in the tag pliers, the tags should pierce the flipper scale and clinch over fully without problem, unless they are deformed while attempting to apply. With practice, you will develop a feel for this. Remember, the aim is to successfully apply a tag that will remain on the turtle for many years! If in doubt, start over, rather than ruin a tag.

If any tags are badly damaged in use, please retain them and return to the project manager as instructed so that proper records of the fate of each tag can be checked.

Application

It is unlikely that you will encounter leatherback turtles. For the hard-shelled turtles, tags are usually applied to the largest scale close to the body on the trailing edge of the fore-flipper(s) as indicated in the diagram below (**a**):



Tags may be applied to either the right or left flipper if single tagged, but location must be recorded correctly on the report form.. You will be given specific instruction about double-tagging, and retagging of remigrant turtles.

Because the tag will pass through living tissue, and, when clinched, may cause pressure which can induce continuing tissue damage, **it is essential to ensure that the flipper and flipper edge is extended properly**, so as to avoid any unnatural alignment of the skin and underlying flipper tissue, **before you attempt to affix the tag.**

If the trailing edge of the flipper is "eroded" or abnormally thickened (e.g. very large turtle), it might not be possible to get the tag to clinch properly, except much closer to the edge of the flipper than is recommended (above). Before you go ahead and fix a tag in 'short', first double check to make sure that the flipper is extended in natural position. If you are just doing a single tag, also check the opposite flipper before proceeding. If there is no way that a 'short' tag can be avoided, do the best possible. **Remember**, the most important aspect is relative position on the flipper. If the tag fits better on the soft tissue beside the preferred scale (side = b), fix it there. Adult turtles will not grow much more, so there is no need to leave any gap between the flipper edge and the 'loop' end of the tag.

In all cases, it is important to maintain good quality control. All tags applied should be carefully checked to ensure they have clinched properly through the slot.

Recording

When recording is being done by a second party, the "tagger" should, after checking proper attachment, read the number and call the number and position clearly and distinctly for the "recorder" who will then repeat the information as it is being recorded for confirmation by the "tagger", e.g.

Tagger: 'Right, three, one, four, six'

Recorder: 'Right, three, one, four, six'

Tagger : Correct (or correction, if required, with similar procedure)

Measurement data and other information should be dealt with similarly when completing each record sheet.

NOTE:- **This recommended procedure might take some getting used to** at first, **but it is essential to ensure accurate recording of the required information at what may be the only time it is available.** Remember, there is no implied judgement as to your ability to do the job if you are the recorder. Strong wind, or some other distracting factor might simply make it extremely difficult to hear first up and write down the correct figures. Once the turtle has been released you usually have little chance of re-checking details.

Happy turtling!

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(PROJECT SUPPORTED BY AUSTRALIAN NATIONAL PARKS AND WILDLIFE SERVICE)

TAGGING - 1990/91

Tag supplies may be very limited for this season. We must therefore focus our tagging work on the most important tasks.

Firstly, for the green turtles, we should aim to have c 500 turtles tagged per site in the early part of the season. Most of these will be single tagged. However, turtles for which we obtain clutch counts in particular should be double tagged. Others for which we have accurate data on time of laying a clutch in the first instance may also be double tagged.

In addition to the above, single tagged green turtles subsequently resighted on the beach and allowing a clutch count or accurate record of completion of laying to be made may have a second tag applied.

Secondly, all loggerhead and hawksbill turtles encountered on nesting beaches should be double tagged, irrespective of activity engaged on. We only have limited numbers of these animals tagged so far, and it is important to maximize our chances of these remaining tagged.

Thirdly, there are reported problems with tag retention on flatbacks. Except at nominated study sites (to be advised), it is probable that very few, if any, flatbacks will be found.

In general, use of tags on flatbacks will be restricted for the time being. Flatbacks turning up at the main green turtle beaches can be double tagged, however. At any other sites, the procedures will be arranged as necessary by direct discussion.

I do not anticipate any real opportunities arising in regard to leatherbacks or olive ridleys.

R.I.T. PRINCE
Senior Research Scientist
Supervisor Marine Turtle Project

October 26, 1990

West Australian Turtle Research - Nesting Turtles

RESIGHTINGS

Department of Conservation and Land Management

Locality _____ Date _____ Obs. _____

tag L.	tag R.	time	activity	nest loc.	egg count	species

1) Please record tag information for both left and right flippers. If single tagged put Nil in the column as needed.

2) Please remeasure remigrant turtles (those tagged previous seasons).

Activity

A = resting at waters edge
B = leaving water
C = climbing beach slope
D = moving over bare sand
E = digging body hole
F = excavating egg chamber
G = laying eggs
H = covering eggs (filling in)
I = returning to water

Nest Location

A = Above H.W. 0
B = At H.W. 0
C = Below H.W. 0
D = Edge Spinifex .. 0
E = In Spinifex 0

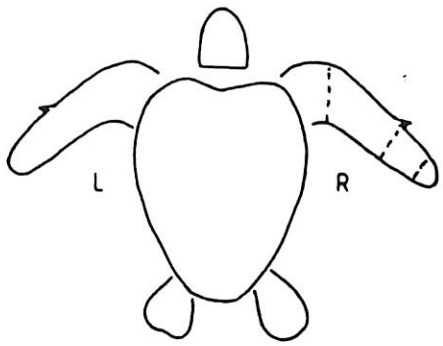
A.W.

Tag No		Posn.
Recapt.		
New		

West Australian Turtle Research - Nesting Turtles

Department of Conservation and Land Management

Locality _____ Date _____ Time _____ a.m. p.m.



Notes

Commensals etc.

barnacles

Chelonibia	0
burrowing	0
fluted	0
Lepas	0
Algae, thick	0
Mud, thick	0
Other	

Nest Location

A = Above H.W.	0
B = At H.W.	0
C = Below H.W.	0
D = Edge Spinifex	0
E = In Spinifex	0

Species

green	0
loggerhead	0
flatback	0
hawksbill	0
ridley	0
luth	0

Soil Type

sand	0
other	

Carapace Curved

length	mm
width	mm

Damage

A = carapace	0
B = LFF	0
C = RFF	0
D = LHF	0
E = RHF	0

Activity

A = resting at waters edge	0
B = leaving water	0
C = climbing beach slope	0
D = moving over bare sand	0
E = digging body hole	0
F = excavating egg chamber	0
G = laying eggs	0
H = covering eggs (filling in)	0
I = returning to water	0

Egg Count

Recorders:

Measured by

Recorded by

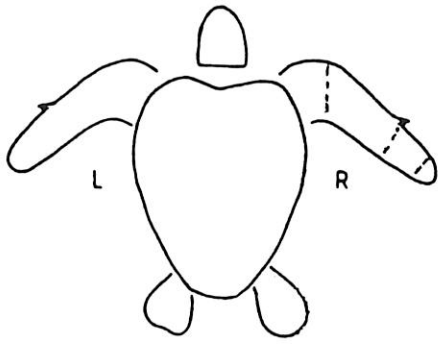
A.W.

Tag No		Posn.
Recapt.		
New		

West Australian Turtle Research - Nesting Turtles

Department of Conservation and Land Management

Locality _____ Date _____ Time _____ a.m. p.m.



Notes

Commensals etc.

barnacles

Chelonibia	0
burrowing	0
fluted	0
Lepas	0
Algae, thick	0
Mud, thick	0
Other	

Nest Location

A = Above H.W.	0
B = At H.W.	0
C = Below H.W.	0
D = Edge Spinifex	0
E = In Spinifex	0

Species

green	0
loggerhead	0
flatback	0
hawksbill	0
ridley	0
luth	0

Soil Type

sand	0
other	

Carapace Curved

length	mm
width	mm

Damage

A = carapace	0
B = LFF	0
C = RFF	0
D = LHF	0
E = RHF	0

Activity

A = resting at waters edge	0
B = leaving water	0
C = climbing beach slope	0
D = moving over bare sand	0
E = digging body hole	0
F = excavating egg chamber	0
G = laying eggs	0
H = covering eggs (filling in)	0
I = returning to water	0

Egg Count

Recorders:

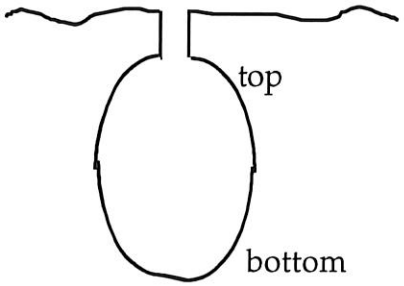
Measured by

Recorded by

A.W.

Marine Turtle Project - Varanus Island 1996/97

Nest:



- •location -in relation to numbered posts
  -below/above high water mark
  -1st dune
- •Substrate -beach sand
  -grass
  -roots
  -humus
- •Depth -top (where last eggs laid)
  -bottom (bottom of egg chamber)
- •Emerged Nests
  -emerged shell count (only if >1/2 an egg count as 1 egg)
  -unfertilised eggs (if no embryo apparent)
  -fertilised, unhatched eggs - with eye spot
  - without eye spot
  -predator destroyed eggs (crabs, lizards)
  -fungal attack
  -hatchlings dead in nest

Eggs:

- •Number -total
  -yolkless
  -double yolker
- •Size -diameter max
  -diameter min
  -mass (g)

Hatchlings:

- •choose random 10
- -straight carapace length
- -mass (g)
- -scale count
- •total number of hatchlings
- •Date laid and emerged (if available)

Turtles:

- •Damage -predators (carapace and limbs)
  -burrowing barnacles
  -large numbers of *Chelonibia*
  -Cutaneous Fibropapillomas
- •Size -Curved Carapace Length
  -Curved Carapace Width
- •Activity -emerging from water
  -returning to water
  -body pitting
  -egg chambering
  -laying
  -filling in
- •Disturbance to Nesting
  -me
  -lights
  -other people
- •Number of attempts at nesting

Environment:

- date
- time of high tide (from observation, not chart!)
- air temperature - at different stages of the night
- soil temperature - as above
- moon - full, half, quarter
  - visible
  - hidden by cloud
- Clouds - clear sky
  - overcast - <0.5 sky visible
  - <0.5 sky visible
- Rain
- Barometric pressure

Also:

- cross tracks after data sheet filled out for turtle
- use flagging tape with both tag numbers and date & put in nest when being laid - can then go back when due to hatch
- when due to emerge, find nest & put plastic fence around each night so can get ten random emergents
- put numbered posts on beaches
- if eggs are measured - mark then 1 - 10 and check when nest emerges to see effect on handling eggs

Equipment:

- tagging pliers
- tags
- tape measure
- pencils
- clipboard
- data sheets
- head torch
- callipers
- scales
- buckets (if nests need to be moved from below the high water mark)
- 10-15m tape measure (to measure distance from posts)
- plastic fencing to keep hatchlings in when emerged
- soil/air thermometre?

Varanus Island Turtle Research Program
Hatchling Data 1996/97

Date:		**Location:**	
Maternal Tags:	RF:	**Date Laid:**	
		Date Emerged:	
	LF:		
		Species:	

Size		**Scale Count**																
SCL (cm)	Wt (g)	nuchal	vert-ebral	post vert.	costal		marginal		post ocular		pre ocular		pre frontal	post parietal		infra marginal		gular

Live in Nest																		