

Annex 1

Tonga Turtle Monitoring and Tagging Workshop

Date: 27 November 2007

Venue: Department of Fisheries, Sopu, Nuku'alofa, Tonga

Agenda:

Time	Activity	Facilitator
8:30am	Opening	Fisheries/Environment
8:40am	Introduction to the Workshop	LB
9:00am	Marine Turtles Overview Marine Turtles in Tonga	LB
9:15am	Turtles life cycle	LB
9:30am	Morning tea	ALL
10:00am	Turtle species identification	LB
10:15am	Turtle movements in the Pacific from Satellite tagging	LB
10:30am	Discussion	ALL
11:00am	Collecting turtle nesting data	LB
11:20am	Guidelines to Turtle Track/nest surveys	LB
12:00pm	Guidelines to Turtle nesting surveys	LB
12:30pm	Lunch	All
1:30pm	Guidelines for measuring turtles	LB
1:45pm	Data collection form	LB
2:00pm	Tonga turtle monitoring schedule	LB
2:30pm	Attaching satellite tagging, process step by step	LB
3:00pm	Afternoon tea	ALL
3:30pm	Demonstration (using real turtles) • Taking and recording measurements; • Turtle flipper tagging and recording; • Tissue sampling	ALL
4:30	Close	

Annex 2

Schedule of Marine Turtle Survey

DECEMBER, 2007

Sun	Mon	Tues	Wed	Thur	Fri	Sat
						1
2	3	4	5	6	7	8
9	10	11	12			15
16	17	18	19	20	21	22
23	24	25	26			29
30	31					

JANUARY, 2008

Sun	Mon	Tues	Wed	Thur	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14			17	18	19
20	21	22	23	24	25	26
27	28			31		

FEBRUARY, 2008

Sun	Mon	Tues	Wed	Thur	Fri	Sat
					1	2
3	4	5	6	7	8	9
10	11			14	15	16
17	18	19	20	21	22	23
24	25	26			29	

Key:

-  Daytime survey turtle track/nest survey
 Night time nesting turtle survey

Annex 3

SOME GUIDELINES FOR TURTLE TRACK/NEST SURVEY

1. Look for turtle tracks above high water mark [among coastal vines etc] and **record**. [Note: Incoming and out-going tides, rain and wind can "wash" away most or all of any tracks on the beach (on the sand)].

However still check the beaches [sand] in case the survey coincides well with the tides making it possible for tracks on the sand during the previous night to be still visible.

2. Remember: Upward track + downward track = 1 total track [1 turtle].

However, note all tracks [upwards and downwards] observed where possible.

Notes: Photos provided are tracks on the sand. A Track through the vines is observed where there is an obvious track with the vines flattened/depressed. The direction where vines are flattened in the middle of the track is the direction of the turtle movement.

3. If a track is undetermined [either not obvious whether a track or not, or the direction of track is unclear], still note it down but marked "undetermined track" or "undetermined direction".
4. When a track is located and recorded, follow it landwards to see whether it leads to a nest and **record** it. Mark the nest so it won't get counted again in future visits.

Note: the turtle sometimes makes more than one "nest-like" nests.

5. When a track is recorded:

- cover it [if on the sand], or
- mark it [if through the vines] and note the mark so it won't be counted [recorded] again in future surveys.

**BE VERY CAREFUL THAT YOU DO NOT STEP ON THE NEST WHICH MIGHT
AFFECT THE EGGS**

Annex 4

TURTLE NESTING/FORAGING MONITORING

Notes:

- This form is used both for Actual Nesting/Foraging Turtle Sighted/Caught and Measured AND for recording Turtle Tracks and Nests
- One form is filled for each Turtle or Tracks/Nest

RECORDERS:	REFERENCE ID¹:		
1. SITE:	2. DATE:	3. TIME:	
3. TURTLE SPECIES: _____			
INFORMATION [please circle one]: [1] Turtle Nesting OR [2] Turtle Foraging OR [3] Track/Nest only If [1] continue below; If [2] fill 6 – 8 below; If [3] fill 9 – 11 below			
4. CONDITIONS: Moon phase: _____ Weather condition [1=very bad; 2=average; 3=fine]			
Tide:	Sea: _____	Rain: _____	Wind: _____
5. Nesting Turtle Observation			
Time: Emerge from sea: _____	Reach nesting area: _____	Start laying eggs: _____	
Finish laying eggs: _____	Finish covering nest: _____	Reach sea again: _____	
Number of eggs laid: _____			
6. TURTLE MEASUREMENTS [refer to Turtle Measurement Guide]			
1. Curved Carapace Length _{Min} [CCL _{Min}]	cm	6. Straight Carapace Length [SCL _{Notch-tip}]	cm
2. Curved Carapace Length _{Max} [CCL _{Notch-tip}]	cm	7. Straight Carapace Width [SCW]	cm
3. Curved Carapace Width [CCW]	cm	8. Total tail length from plastron [TTL]	cm
4. Straight Carapace Length _{Min} [SCL _{Min}]	cm	9. Post-cloacal tail length [PTL]	cm
5. Straight Carapace Length _{Max} [SCL _{Max}]	cm		
7. Turtle ID and Tissue Sample			
Is turtle already tagged?: _____	If yes, note Tag ID	Left flipper: _____	Right flipper: _____
If not tagged, any tag scars: _____	If yes, describe: _____		
If turtle not tagged already, TAG IT during survey and record info below:			
Tag ID	Left flipper: _____	Right flipper: _____	
Tissue Sample for Genetic Analysis			
Sample Taken: [Yes] [No]	If "YES", Sample ID Label: _____		
8. TURTLE INSPECTION			
Any noticeable marks etc on the turtle body [e.g. of a disease, cut etc]: Note details if any: _____			
9. NEST INFORMATION			
Distance of nest from high water mark:	Nest diameter:	Depth:	
10. TRACK INFORMATION			
Was turtle observed?	# Tracks Observed:	Tracks width:	
11. OTHER INFORMATION			
Any photo taken?	Other Info:		

¹ Reference ID formula: Date [dd/mm/yy]_Site [e.g. Vini]_Record # for that date at that site e.g. 021003_Vini_1 is for first record at Vini on 2nd Oct 2003

Annex 5

DAY TIME TURTLE AND TRACK SURVEY FORM

Annex 6

NESTING TURTLES SURVEY: GENERAL GUIDELINES

On the beach:

- No heavy equipment
- No camp fires or barbecues
- Do not leave large items such as chairs, umbrellas etc on nesting beaches at night - these can obstruct a turtle's path and prevent egg-laying
- No pets
- Keep beach lighting to a minimum - artificial lighting disorients turtles
- Shield or switch off lighting which is visible from the beach

Watching nesting turtles:

On land, turtles are very vulnerable and if startled, a female turtle may return to the sea before her eggs can be successfully laid. Follow the following rules when watching nesting turtles:

- Keep disturbance to a minimum - stay quiet and move around slowly;
- Do not approach turtles as they arrive from the sea: they are easily frightened off;
- Turtles that have not yet laid their eggs must be left alone;
- Make minimum use of flashlights; never shine lights directly into a turtle's face;
- Try not to trap turtles-approach them from behind and keep low to the ground;
- Move away if the turtle shows signs of distress;
- Turtle eggs and hatchlings should be left undisturbed;
- Consider limiting viewing to 30 minutes at a time?

Taking Photographs:

If using a camera flash, do so sparingly and:

- Never take photographs before a turtle has laid her eggs
- Only take photographs from behind the turtle - the flash will temporarily blind her and complicate her return to the sea.

Taking measurements and tagging breeding turtles:

- Never take any measurements of a breeding turtle before or during egg-laying. All measurements and tagging are to be conducted after egg-laying.

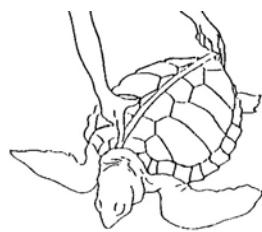
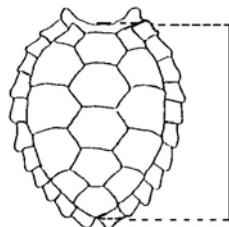
Hatchling turtles:

- Try to shield hatchlings if they appear disoriented by beachfront lighting - place yourself between the hatchlings and the light sources, and ask that the lights be turned off long enough for the hatchlings to reach the sea;
- Do not interfere with their crawl to sea as this could jeopardize their survival;
- Do not photograph hatchlings - they are very sensitive to light.

Annex 7

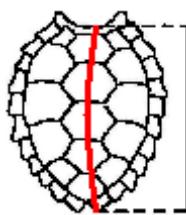
TURTLE MEASUREMENTS GUIDELINES

1.



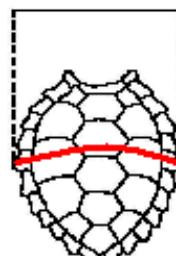
CCL_{min} [Curved Carapace Length minimum] – is measured from the anterior point at the nauchal scute to the posterior notch between the supracaudal using a flexible measuring tape following the surface of the carapace.

2.



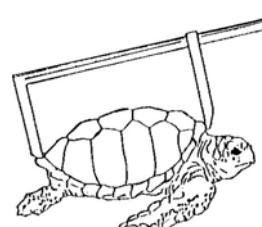
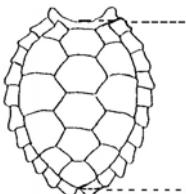
CCL_{max} (notch to tip) [Curved Carapace Length maximum] – is measured from the anterior point at the nauchal scute to the posterior tip of the supracaudal using a tape measure following the surface of the carapace.

3.



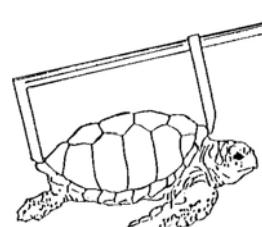
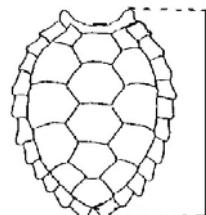
CCW [Curved Carapace Width] – is measured across the widest point of the carapace using a flexible measuring tape following the curve of the carapace.

4.



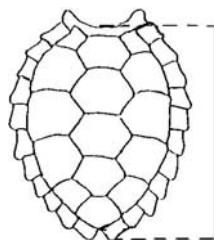
SCL_{min} [Straight Carapace Length minimum] – is measured from the anterior point at the nauchal scute to the posterior notch between the supracaudal using rigid calipers.

5.



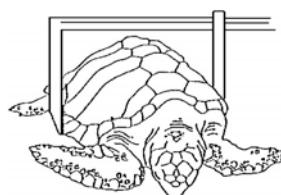
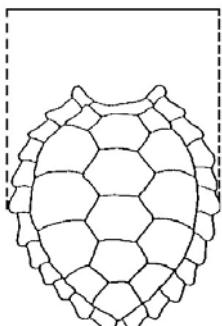
SCL_{max} [Straight Carapace Length Maximum] – is measured from the anterior edge of the carapace to the posterior tip of the supracaudals. Anterior and posterior locations should be on the same side of the carapace.

6.



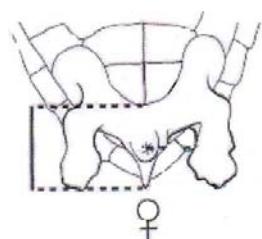
SCL notch to tip – is measured from the anterior point at nauchal scute to the posterior tip of the supracaudal using rigid calipers.

7.



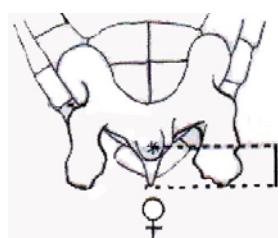
SCW [Straight Carapace Width] – is measured from the widest point of the carapace using rigid calipers.

8.

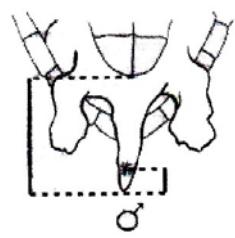


TTL [Total Tail Length] – is the distance from the mid-line of the posterior margin of the plastron to the end of the tail

9.



PTL [Post-cloacal Tail Length] – is the distance from the mid-cloacal opening to the end of the tail.

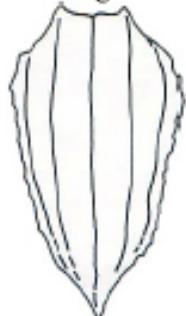


TTL [Total Tail Length] & PTL measurements for Male Turtles.

	<p>Green Turtle <i>Chelonia mydas</i></p> <ul style="list-style-type: none"> • Small blunt head, serrated jaw, 1 pair prefrontal scales • Large, smooth oval carapace – high domed • 4 costal scutes (scales) side by side and not overlapping • Carapace is dark green or grey or green-brown in colour • 1 claw on all flippers • Length: up to 153cm: Weight: up to 205kg • Diet: feed on algae and seagrass • Species Status: Endangered (IUCN)
	<p>Hawksbill Turtle <i>Eretmochelys imbricata</i></p> <ul style="list-style-type: none"> • Narrow head, long beak-like mouth, jaw not serrated, 2 pairs of prefrontal scales • Narrow and elongated carapace with 4 overlapping scales • Carapace is orange, brown-black or brown-yellow in colour • 2 claws on all flippers • Length: up to 82cm: Weight: up to 80kg • Diet: feed on sponges, anemones, squids and shrimps • Species Status: Critically endangered
	<p>Leatherback Turtle <i>Dermochelys coriacea</i></p> <ul style="list-style-type: none"> • Large, elongated carapace with 5 distinct ridges, no scales • Carapace is dark grey or black with white spots • No claws on all flippers, front flippers are longer than any other sea turtle • Length: up to 270cm: Weight: up to 912kg • Diet: feed on jellyfish and soft bodied invertebrates • Species Status: Critically endangered
	<p>Olive Ridley Turtle <i>Lepidochelys olivacea</i></p> <ul style="list-style-type: none"> • Head is triangular with parrot-like beak, 2 pairs of prefrontal scales • Carapace nearly round, variable number of scales from 5 to 9 • Carapace is olive green in colour and heart shaped • 2 claws on all flippers • Length: up to 74cm: Weight: 50kg • Diet: feed on shellfish, small crabs, seagrass and algae • Species Status: Endangered
	<p>Loggerhead Turtle <i>Caretta caretta</i></p> <ul style="list-style-type: none"> • Large head, 2 pairs of prefrontal scales • Broad carapace with 5 pairs of scales • Carapace is reddish brown in colour and shaped like a heart • 2 claws on all flippers • Length: up to 100cm: Weight: up to 182kg • Diet: feed on shellfish, crabs and jellyfish • Species Status: Endangered
	<p>Flatback Turtle <i>Natator depressus</i></p> <ul style="list-style-type: none"> • Carapace is grey and has soft skin covering a flat carapace, 1 prefrontal scales • Carapace is flattened with upturned edges and is covered by a thin, fleshy skin • Length: up to 96cm: Weight: up to 70kg • Diet: feed on molluscs, jellyfish and soft bodied invertebrates • Species Status: Endangered

IDENTIFICATION KEY

- Leathery carapace with**
- 5 – 7 distinct ridges
 - No large scales



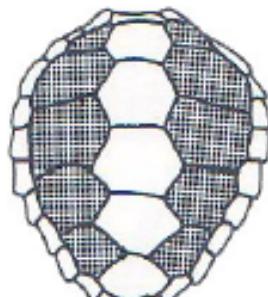
Leatherback turtle
Dermochelys coriacea

- Hard carapace with**
- No distinct ridges
 - Large scales

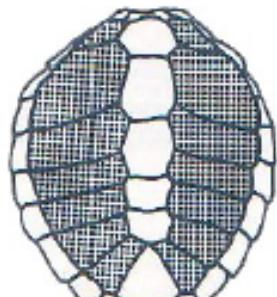
4 costal scales



5 (rarely 6) costal scales



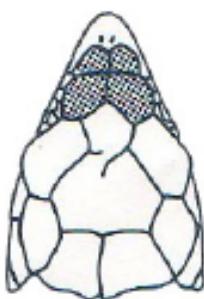
6 or more costal scales



Loggerhead turtle
Caretta caretta

Olive ridley turtle
Lepidochelys olivacea

2 pairs prefrontal scales

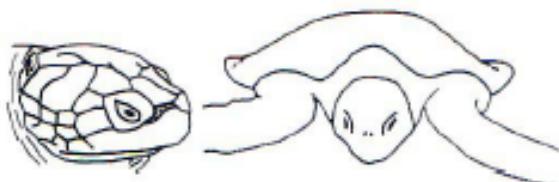


Hawksbill turtle
Eretmochelys imbricata

1 pair prefrontal scales



- Low domed carapace with upturned edges
- Preocular scale present
- Colour olive grey



Flatback turtle

Natator depressus

- High domed carapace
- No preocular scales
- Colour light to dark green with dark mottling



Green turtle

Chelonia mydas