

## Annex 1

### Tonga Turtle Monitoring and Tagging Workshop

Date: 27 November 2007

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

#### Agenda:

| Time    | Activity  | Facilitator           |
|---------|---|-----------------------|
| 8:30am  | Opening   | Fisheries/Environment |
| 8:40am  | Introduction to the Workshop  | LB                    |
| 9:00am  | Marine Turtles Overview<br>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<br>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<br>by step  | LB                    |
| 3:00pm  | Afternoon tea   | ALL                   |
| 3:30pm  | Demonstration (using real turtles) <ul style="list-style-type: none"><li>• Taking and recording measurements;</li><li>• Turtle flipper tagging and recording;</li><li>• Tissue sampling</li></ul> | 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  | 13   | 14  | 15  |
| 16  | 17  | 18   | 19  | 20   | 21  | 22  |
| 23  | 24  | 25   | 26  | 27   | 28  | 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  | 15   | 16  | 17   | 18  | 19  |
| 20  | 21  | 22   | 23  | 24   | 25  | 26  |
| 27  | 28  | 29   | 30  | 31   |     |     |

#### FEBRUARY, 2008

| Sun | Mon | Tues | Wed | Thur | Fri | Sat |
|-----|-----|------|-----|------|-----|-----|
|     |     |      |     |      | 1   | 2   |
| 3   | 4   | 5    | 6   | 7    | 8   | 9   |
| 10  | 11  | 12   | 13  | 14   | 15  | 16  |
| 17  | 18  | 19   | 20  | 21   | 22  | 23  |
| 24  | 25  | 26   | 27  | 28   | 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

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

<sup>1</sup> 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 2<sup>nd</sup> Oct 2003

## Annex 5

### DAY TIME TURTLE AND TRACK SURVEY FORM

| Date of Survey | Name of Island Surveyed | Number of Tracks | Number of New Nests | Comments |
|----------------|-------------------------|------------------|---------------------|----------|
|                |                         |                  |                     |          |
|                |                         |                  |                     |          |
|                |                         |                  |                     |          |
|                |                         |                  |                     |          |
|                |                         |                  |                     |          |
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|                |                         |                  |                     |          |
|                |                         |                  |                     |          |
|                |                         |                  |                     |          |
|                |                         |                  |                     |          |
|                |                         |                  |                     |          |

## **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:**

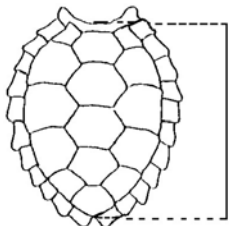
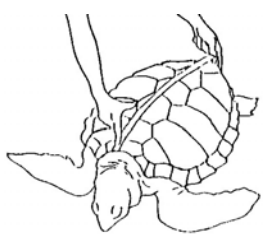
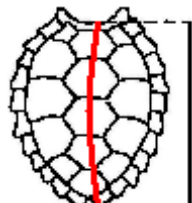
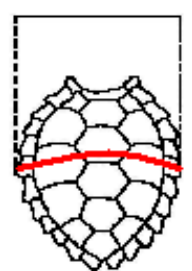
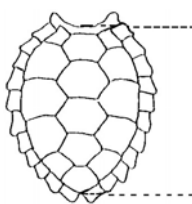
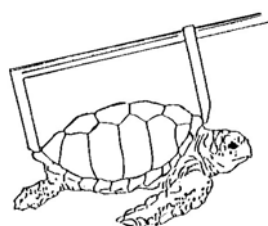
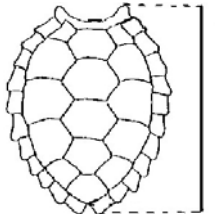
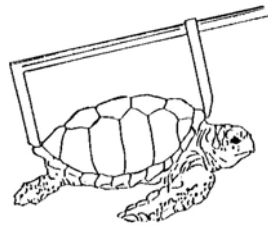
- Never take any measurements of a breeding turtle before or during egg-laying. All measurements and tagging are to be conducted after egg-laying.

#### **Hatchling turtles:**

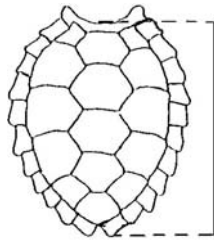
- Try to shield hatchlings if they appear disoriented by beachfront lighting - place yourself between the hatchlings and the light sources, and ask that the lights be turned off long enough for the hatchlings to reach the sea;
- Do not interfere with their crawl to sea as this could jeopardize their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

## Annex 7

### TURTLE MEASUREMENTS GUIDELINES

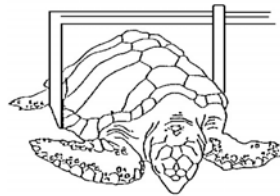
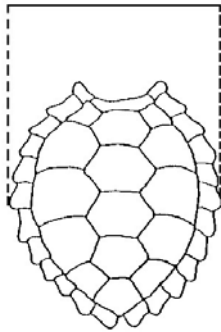
|    |   |   |  |
|----|---|---|--|
| 1. |    |    | <b>CCL<sub>min</sub></b> [ <b>C</b> urved <b>C</b> arapace <b>L</b> ength <b>min</b> imum] – is measured from the anterior point at the nuchal scute to the posterior notch between the supracaudal using a flexible measuring tape following the surface of the carapace. |
| 2. |    |   | <b>CCL<sub>max</sub> (notch to tip)</b> [ <b>C</b> urved <b>C</b> arapace <b>L</b> ength <b>max</b> imum] – is measured from the anterior point at the nuchal scute to the posterior tip of the supracaudal using a tape measure following the surface of the carapace.    |
| 3. |  |   | <b>CCW</b> [ <b>C</b> urved <b>C</b> arapace <b>W</b> idth] – is measured across the widest point of the carapace using a flexible measuring tape following the curve of the carapace.   |
| 4. |  |  | <b>SCL<sub>min</sub></b> [ <b>S</b> traight <b>C</b> arapace <b>L</b> ength <b>min</b> imum] – is measured from the anterior point at the nuchal scute to the posterior notch between the supracaudal using rigid calipers.  |
| 5. |  |  | <b>SCL<sub>max</sub></b> [ <b>S</b> traight <b>C</b> arapace <b>L</b> ength <b>Max</b> imum] – 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.



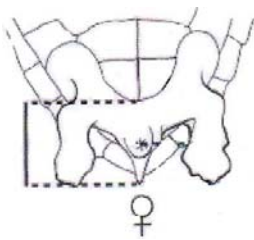
**SCL notch to tip** – is measured from the anterior point at nuchal scute to the posterior tip of the supracaudal using rigid calipers.

7.



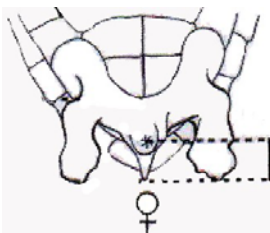
**SCW** [Straight Carapace Width] – is measured from the widest point of the carapace using rigid calipers.

8.

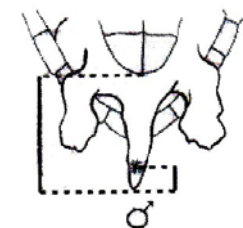


**TTL** [Total Tail Length] – is the distance from the mid-line of the posterior margin of the plastron to the end of the tail

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.

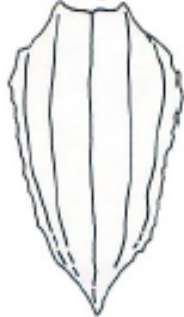


|   |   |
|---|---|
|    | <p><b>Green Turtle</b> <i>Chelonia mydas</i></p> <ul style="list-style-type: none"> <li>• Small blunt head, serrated jaw, 1 pair prefrontal scales</li> <li>• Large, smooth oval carapace – high domed</li> <li>• 4 costal scutes (scales) side by side and not overlapping</li> 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

## 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

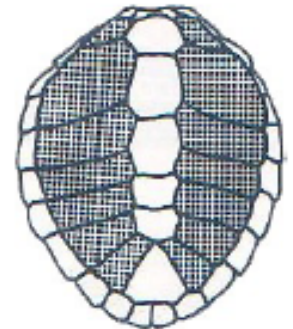


5 (rarely 6) costal scales



**Loggerhead turtle**  
*Caretta caretta*

6 or more costal scales



**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*