APACHE ENERGY

1998/1999 Sea turtle tagging program
Varanus Island

Introduction

Dan Kamien carried out the 1998/1999 sea turtle tagging program. The following is a summary of the data he collected during the program.

The aims of the program are to:

- Tag animals;
- Measure animals;
- Count and measure eggs;
- Gather data on the physical characteristics of nests;
- Assess hatching success rates.

Methods

Data was collected in the field on the following dates.
Nov 30 – Dec 4 1998 (evacuated for TC Billy)
Dec 8 – Dec 18 (return to Perth for Christmas)
Jan 4 – Jan 29 1999 (end of project)

Nightly patrols were carried out on Harriet, Pipeline, Tannys and Andersons Beaches on Varanus Island.

Nesting adult measurements

The following data was collated for all animals intercepted:

- Activity;
- Animal size – a flexible fibre glass tape was used to measure curved carapace length and curved carapace width;
- Egg size (if applicable);
- Clutch size (if applicable);
- Time, place and date of emergence from the ocean;
- Nest location;
- Presence of commensals; and
- Damage or injury to animal.

Cooks Beach was visited every 3-4 days to obtain general information on beach use based on track observations.

Titanium tags were attached to previously untagged turtles. Tags were placed on the posterior edge of the left and right flippers. For previously tagged turtles (remigrants) the condition of the tags was checked and the number recorded. Any missing tags were replaced with new ones.

An example datasheet is attached.

Clutch excavation

Nests were excavated and the numbers of eggs in the clutch were counted within 2 hours following oviposition. A piece of flagging tape was placed in the nest so that it could be easily located. The eggs were counted and a sub-sample of fifteen eggs were cleaned of sand with a paintbrush prior to being measured and weighed. Eggs were weighed using a spring balance and the maximum diameter was determined using vernier callipers.

The temperature of the bottom of the egg chamber was recorded by placing the thermometer approximately 2 cm under the sand at the bottom of the egg chamber immediately after the eggs were removed. The depth of the egg chamber was also noted.

Following this, the eggs were placed back in the egg chamber and covered with sand to the approximate depth before being excavated.

Hatchlings

Newly emerged nests were indicated by the presence of hatchling tracks. Nests were excavated and the numbers of live and dead hatchlings were recorded in addition to the total number of eggs and empty shells. Unhatched eggs in good condition were weighed using a spring balance and measured using vernier callipers before being opened to determine the stage of development. Live hatchlings were weighed using a spring balance and their straight carapace length, straight carapace

width and head width were measured using vernier callipers. For each nest the depth and temperature of the egg chamber was recorded.

Results

Tagging data

A total of 47 animals (remigrants plus new animals) were recorded on the beaches of Varanus Island over the study period.

A total of 17 new animals were tagged:

- 5 Hawksbills
- 12 Flatbacks

Thirty remigrants were counted:

- 15 Hawksbills
- 15 Flatbacks (including two dead ones found on North Mangrove Beach)

Beach preference is summarised in the following table, which shows the total number of animals, observed on each beach during the Dec 98 and Jan 99 survey period. The data included animals returning to nest more than once during the season.

Beach	Flatbacks	Hawksbills
Andersons	2	2
Harriet	5	2
North Mangrove	6	0
Pipeline	3	23
South Mangrove	0	0
Tannys	15	0

These results show clear preference of Hawksbills for Pipeline Beach and Flatbacks for Tannys Beach over the 1998/1999 season.

No green turtles were observed this year.

The complete data set for the 1998/1999 tagging season is attached.

Adult emergence

Nesting turtles were observed between 20:00 and 03:00 hours with the majority emerging before midnight.

The emergence of Flatback turtles appeared to be closely correlated with the maximum nightly high tide; however Hawksbill emergences were not. There did not appear to be any preferences with regard to the state of the tide (ebb vs flood).

Eggs

Hawksbills laid significantly more and smaller eggs than Flatbacks. The size of the mother had no relationship to the clutch size or mass. Larger Flatback females produced significantly larger eggs. Clutch size is inversely proportional to egg weights. Clutch size ranged from 86-182 eggs for Hawksbills and 31-64 eggs for Flatbacks.

Hatchlings

Hatchling success was greater for Flatbacks (85±15%) than for Hawksbills (61±26%).

Conclusions

This study provides some basic life history information for Flatback and Hawksbill turtles on Varanus Island. Ongoing monitoring of the Varanus Island population will provide data on long-term trends.

* EXAMPLE DATASHEET *

Tag No		Posn.
Recapt.		
New	31702	L
	31706	R

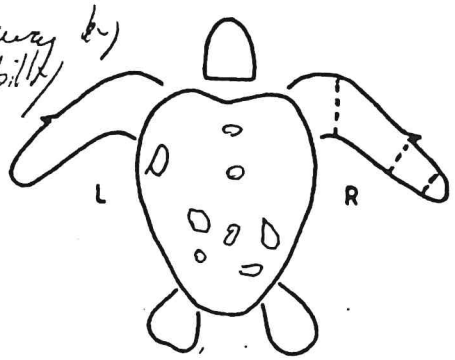
West Australian Turtle Research - Nesting Turtles

Department of Conservation and Land Management

Team Members: Martin, Dan

Locality pipe line Date 1/12/98 Time 21:00 a.m. p.m.

Marker 1 HKS washed away by cyclone Billy



Notes temp eggchamber = 28-29°C

eggs 97 visual (Martin)

excavation = 117 eggs

egg wt (g)

34	32	33	33·5	34
32	31·5	34	33·5	32·5
32·5	31·5	33	33	31

$\bar{x}$ = 32.7

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
- Iuth 0

Soil Type
- sand 0
- other

Carapace Curved
- length 830 mm
- width 765 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 117 Count
97 visual

Recorders:
Measured by Dan Recorded by Dan

A.W.

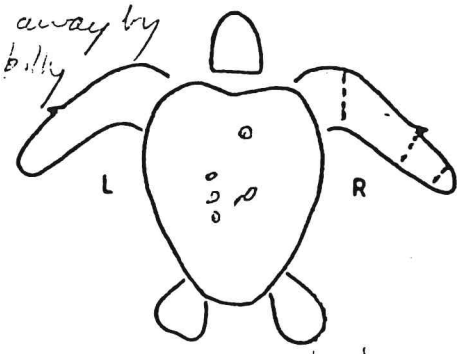
Tag No.		Posn.
Recapt.	24438	L
	7780	R
	24437	
New		

West Australian Turtle Research - Nesting Turtles

Department of Conservation and Land Management

Locality pipe line Date 1/12/98 Time 21:40 a.m. p.m.

Marker 2 HKS washed away by cyclone billy



Notes temp egg chamber = 27·8°C

right tags retrieved on 30-11-98 last night.

30	29·5	30	30	29·5
30·5	30	30·5	30	31·5
30·5	30·5	30	30	30

$\bar{x}$ = 30.2

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
- Iuth 0

Soil Type
- sand 0
- other

Carapace Curved
- length 805 mm
- width 755 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 89 excavation

Recorders:
Measured by Dan Recorded by Dan

New/Recapture	left 1	left 2	right 1	right 2	date	time	beach	species
Recap	24438		7780	24437	30/11/98	20:10	Pipeline	Hawksbill
R	30761		30760		30/11/98	21:00	Tanny's	Flatback
Recap	24438		7780	24437	1/12/98	21:40	Pipeline	Hawksbill
N	31702		31706		1/12/98	21:00	Pipeline	Hawksbill
Recap			2298		2/12/98	21:05	Pipeline	Hawksbill
Recap			15237		2/12/98	21:10	Pipeline	Hawksbill
R	24427		7804	24426	2/12/98	21:10	Pipeline	Hawksbill
R	7892		31709		8/12/98	20:00	Pipeline	Hawksbill
R	7789		25533	24415	9/12/98	01:140	Harriet	Flatback
R	31710		7895		10/12/98	00:25	Pipeline	Hawksbill
N	31711		31712		11/12/98	00:10	Pipeline	Hawksbill
N	31716		31717		11/12/98	01:45	North Mangrov	Flatback
R	30722	31713	30721		11/12/98	00:35	Tanny's	Flatback
R	31714		30787	31715	11/12/98	00:26	Tanny's	Flatback
R	22725		22724		11/12/98	01:35	Tanny's	Flatback
N	31718		31719		12/12/98	20:05	Pipeline	Hawksbill
R	24494		24493		14/12/98	22:30	Pipeline	Hawksbill
N	31720		31721		15/12/98	22:10	Pipeline	Hawksbill
R	30761		30760		16/12/98	20:05	Tanny's	Flatback
R	31725		7791		16/12/98	20:55	Andersons	Hawksbill
R	13901				16/12/98	00:15	Pipeline	Hawksbill
N	31723		31724		16/12/98	00:25	Pipeline	Hawksbill
R	31707		15327		17/12/98	23:05	Harriet	Hawksbill
R	13945		1655		17/12/98	20:30	Pipeline	Flatback
R	24438		7780	24437	17/12/98	20:15	Pipeline	Hawksbill
R	31725		7791		17/12/98	22:45	Andersons	Hawksbill
R	31710		7895		5/01/99	23:51	Pipeline	Hawksbill
R	24427		24426		5/01/99	22:15	Pipeline	Hawksbill
R	31727		2875	31726	5/01/99	22:00	Pipeline	Hawksbill
R	24462		2242	24461	5/01/99	00:50	Andersons	Flatback
Recap - Dead	30748		30743		5/01/99	21:25	North Mangrov	Flatback
R			30720		8/01/99	21:00	Tanny's	Flatback
R	13945		1655		10/01/99	21:10	Pipeline	Flatback
R	31728		7792		10/01/99	00:03	Pipeline	Hawksbill
R	15248	24467	15247	24466	11/01/99	21:30	Andersons	Flatback
N	31729				11/01/99	21:05	North Mangrov	Flatback
R	31729		31731		12/01/99	21:00	Tanny's	Flatback
R	30726	31730	30725		12/01/99	21:25	Tanny's	Flatback
N	31733		31732		14/01/99	21:30	Tannys	Flatback
N	31734		31735		15/01/99	00:30	Tannys	Flatback
N	31736				15/01/99	21:55	Harriet	Flatback
N	31737				15/01/99	23:40	Harriet	Flatback
R	31701		24430		15/01/99	21:00	Harriet	Flatback
R			7822		15/01/99	22:55	Pipeline	Hawksbill
R	24438		7780	24437	16/01/99	20:30	Pipeline	Hawksbill
R	22725		22724		17/01/99	20:50	Tanny's	Flatback
R	31738		30720		21/01/99	23:55	North Mangrov	Flatback
N	31739		31740		22/01/99	22:00	Tannys	Flatback
R	13945		1655		23/01/99	21:25	Pipeline	Flatback
N	31741		31742		23/01/99	00:42	North Mangrov	Flatback
N	31743		31744		24/01/99	00:25	Tannys	Flatback
N	31745				25/01/99	02:05	Tannys	Flatback
R	30727				25/01/99	01:20	Tannys	Flatback
N	31746				26/01/99	20:30	North Mangrov	Flatback
N	31747		31748		26/01/99	20:45	North Mangrov	Flatback
R			7822		27/01/99	20:55	Pipeline	Hawksbill
R	31701		24430		27/01/99	21:40	Harriet	Flatback
Recap - DEAD			30727		28/01/99	14:50	South Mangrov	Flatback
R			15278		28/01/99	23:40	Harriet	Hawksbill

File No: C7.9

28 April 1999

Department of Conservation & Land Management
Locked Bag 104
Bentley Delivery Centre
BENTLEY WA 6983

Attention: N Caporn

Dear Sir

RE: 1998/1999 Turtle Nesting Season Tagging Program Results

Please find enclosed a copy of the report summarising the results of the 1998/1999 turtle tagging program. The original data has been forwarded to Keith Morris and Bob Prince of CALM Woodvale.

Yours sincerely

Iva Stejskal

IVA STEJSKAL
Environmental Manager

CC:

CALM Woodvale
Attn: RIT Prince

CALM Karratha
Attn: W Boggs

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