2 of 3

BALAZS (808) 286-2899

BALAZS

COMPOSITION

AUSTRALIA

JUNE 98 - MORETON BAY - FP

JUNE 99 - BRISBANE PROGRAM REVIEW P. 154

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NMFS, HONOLULU LAB
Marine Turtle Research
2570 Dole Street
Honolulu, HI 96822-2396

JANUARY 03 - HERON IS.

DECEMBER 03 - MON REPOS

MON REPOS CONSERVATION PARK

GEORGE H. BALAZS
ZOOLOGIST AND LEADER
MARINE TURTLE RESEARCH
and
Regional Vice Chairman for the Pacific Islands
IUCN Marine Turtle Specialist Group

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Oahu turtle strandings: (808) 983-5730

DATE 16JUN98

TAG NOS. T85191 SPECIES Cm CCL 931 SEX

(71)

PATH NOS. #31

TUMORS	#1	#2	#3	#4	TOTAL	REMARKS
RIGHT EYE						
LEFT EYE						
MOUTH						
NECK						
RIGHT FRONT FLIPPER						
LEFT FRONT FLIPPER						
RIGHT HIND FLIPPER						
LEFT HIND FLIPPER						
CLOACA/TAIL			1			SMOOTH, BLACK POSSIBLY REGRESS
SEAMS/SCUTES						
INTERNAL						
TOTAL						

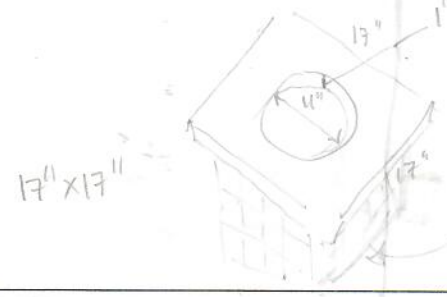
OVERALL TUMOR SCORE: _____

APPROXIMATE TUMOR SIZE CATEGORIES:

#1 = DETECTABLE PATCH TO 1CM DIAMETER
#2 = >1CM TO 4CM
#3 = >4CM TO 10CM
#4 = >10CM

OTHER:

SUSC: PINK SPOTS ON VENTRUM



"TURTLE HEAD STAND"

GPS:

(72)

DATE 18Jun98

TAG NOS. T79114 SPECIES Cm CCL 63.4 SEX F

PATH NOS. #39

TUMORS	#1	#2	#3	#4	TOTAL	REMARKS
RIGHT EYE	1					
LEFT EYE	1					
MOUTH						
NECK	1					
RIGHT FRONT FLIPPER						
LEFT FRONT FLIPPER	6	1	1			
RIGHT HIND FLIPPER						
LEFT HIND FLIPPER						
CLOACA/TAIL						
SEAMS/SCUTES	6					VENTRAL MARGIN
INTERNAL						
TOTAL						

OVERALL TUMOR SCORE: _____

APPROXIMATE TUMOR SIZE CATEGORIES:

#1 = DETECTABLE PATCH TO 1CM DIAMETER
#2 = >1CM TO 4CM
#3 = >4CM TO 10CM
#4 = >10CM

OTHER: PHOTOS

BIOPSIED: 2 ON LFF
" 2 ON SCUTES
" NORMAL SKIN

GPS:

DATE 19Jun98

TAG NOS. K7104 SPECIES Green CCL 57.4 SEX M

74

PATH NOS. #40

TUMORS	#1	#2	#3	#4	TOTAL	REMARKS
RIGHT EYE	1					
LEFT EYE	1					
MOUTH						
NECK						
RIGHT FRONT FLIPPER						
LEFT FRONT FLIPPER						
RIGHT HIND FLIPPER						
LEFT HIND FLIPPER						
CLOACA/TAIL						
SEAMS/SCUTES						
INTERNAL						
TOTAL						

OVERALL TUMOR SCORE: _____

APPROXIMATE TUMOR SIZE CATEGORIES:

#1 = DETECTABLE PATCH TO 1CM DIAMETER
#2 = >1CM TO 4CM
#3 = >4CM TO 10CM
#4 = >10CM

OTHER:

GPS:

DATE 18 Jun 98

(75)

TAG NOS. T78636 SPECIES GREEN CCL 57.4 SEX M

PATH NOS. #41

TUMORS	#1	#2	#3	#4	TOTAL	REMARKS
RIGHT EYE	1	1				SCLERA
LEFT EYE	1					
MOUTH						
NECK						
RIGHT FRONT FLIPPER						
LEFT FRONT FLIPPER						
RIGHT HIND FLIPPER						
LEFT HIND FLIPPER						
CLOACA/TAIL						
SEAMS/SCUTES						
INTERNAL						
TOTAL						

OVERALL TUMOR SCORE: _____

APPROXIMATE TUMOR SIZE CATEGORIES:

#1 = DETECTABLE PATCH TO 1CM DIAMETER
#2 = >1CM TO 4CM
#3 = >4CM TO 10CM
#4 = >10CM

OTHER:

GPS:

DATE 18 Jun 98

TAG NOS. K1542 SPECIES GreeN CCL 58,7 SEX F

(10)

PATH NOS. #42

TUMORS	#1	#2	#3	#4	TOTAL	REMARKS
RIGHT EYE						
LEFT EYE						
MOUTH						
NECK						
RIGHT FRONT FLIPPER						
LEFT FRONT FLIPPER	1					ventral
RIGHT HIND FLIPPER						
LEFT HIND FLIPPER						
CLOACA/TAIL						
SEAMS/SCUTES						
INTERNAL						
TOTAL						

OVERALL TUMOR SCORE: _____

APPROXIMATE TUMOR SIZE CATEGORIES:

#1 = DETECTABLE PATCH TO 1CM DIAMETER
#2 = >1CM TO 4CM
#3 = >4CM TO 10CM
#4 = >10CM

OTHER:

GPS:

DATE 16 Jun 98

(77)

TAG NOS. K7403 SPECIES GREEN CCL 75,7 SEX M

PATH NOS. #43

TUMORS	#1	#2	#3	#4	TOTAL	REMARKS
RIGHT EYE	1					
LEFT EYE	1					
MOUTH		1				L JAW HINGE (SMALL #2)
NECK						
RIGHT FRONT FLIPPER						
LEFT FRONT FLIPPER						
RIGHT HIND FLIPPER						
LEFT HIND FLIPPER						
CLOACA/TAIL						
SEAMS/SCUTES						
INTERNAL						
TOTAL						

OVERALL TUMOR SCORE: _____

APPROXIMATE TUMOR SIZE CATEGORIES:

#1 = DETECTABLE PATCH TO 1CM DIAMETER
#2 = >1CM TO 4CM
#3 = >4CM TO 10CM
#4 = >10CM

OTHER:

GPS:

DATE 18JUN98

TAG NOS. K7281 SPECIES GREEN CCL 71.1 SEX M

(78)

PATH NOS. 44

TUMORS	#1	#2	#3	#4	TOTAL	REMARKS
RIGHT EYE	1					ANT
LEFT EYE	2					
MOUTH						
NECK						
RIGHT FRONT FLIPPER						
LEFT FRONT FLIPPER	1	1				DENTAL TAG PIERCE
RIGHT HIND FLIPPER	1					
LEFT HIND FLIPPER		1				
CLOACA/TAIL						LEECHES
SEAMS/SCUTES						
INTERNAL						
TOTAL						

OVERALL TUMOR SCORE: _____

APPROXIMATE TUMOR SIZE CATEGORIES:

#1 = DETECTABLE PATCH TO 1CM DIAMETER
#2 = >1CM TO 4CM
#3 = >4CM TO 10CM
#4 = >10CM

OTHER: LEECH EGGS

GPS:

DATE 18 JUN 98

TAG NOS. T 53800 SPECIES LOGGERHEAD CCL 84.8 SEX M

(79)

PATH NOS. # 46

TUMORS	#1	#2	#3	#4	TOTAL	REMARKS
RIGHT EYE						
LEFT EYE						
MOUTH						
NECK						
RIGHT FRONT FLIPPER						
LEFT FRONT FLIPPER	1	1				4X1cm SKIN TAG FROM TRAILING EDGE OF
RIGHT HIND FLIPPER						
LEFT HIND FLIPPER						
CLOACA/TAIL						
SEAMS/SCUTES						
INTERNAL						
TOTAL						

OVERALL TUMOR SCORE: _____

APPROXIMATE TUMOR SIZE CATEGORIES:

#1 = DETECTABLE PATCH TO 1CM DIAMETER
#2 = >1CM TO 4CM
#3 = >4CM TO 10CM
#4 = >10CM

OTHER: BIOPSIED

BIOPSIED IN 1991 BY ~~BNDTA~~ GOLDON ; NO DETAILS ON RESULTS

9 YRS OF HISTORY W THIS GROWTH

GPS:

DATE 18JUN98

TAG NOS. K5964 SPECIES GREEN CCL 86.7 SEX F

(80)

PATH NOS. 48

TUMORS	#1	#2	#3	#4	TOTAL	REMARKS
RIGHT EYE						
LEFT EYE						
MOUTH						
NECK						
RIGHT FRONT FLIPPER						
LEFT FRONT FLIPPER		1				BY TAG SITE
RIGHT HIND FLIPPER						
LEFT HIND FLIPPER						
CLOACA/TAIL						
SEAMS/SCUTES						
INTERNAL						
TOTAL						

OVERALL TUMOR SCORE: _____

APPROXIMATE TUMOR SIZE CATEGORIES:

#1 = DETECTABLE PATCH TO 1CM DIAMETER
#2 = >1CM TO 4CM
#3 = >4CM TO 10CM
#4 = >10CM

OTHER:

GPS:

(81)

DATE 18JUN 98

TAG NOS. T93083 SPECIES GREEN CCL 82.4 SEX F

PATH NOS. 49

TUMORS	#1	#2	#3	#4	TOTAL	REMARKS
RIGHT EYE						
LEFT EYE						
MOUTH						
NECK						
RIGHT FRONT FLIPPER						
LEFT FRONT FLIPPER		1				
RIGHT HIND FLIPPER						
LEFT HIND FLIPPER						
CLOACA/TAIL						
SEAMS/SCUTES						
INTERNAL						
TOTAL						

OVERALL TUMOR SCORE: _____

APPROXIMATE TUMOR SIZE CATEGORIES:

#1 = DETECTABLE PATCH TO 1CM DIAMETER
#2 = >1CM TO 4CM
#3 = >4CM TO 10CM
#4 = >10CM

OTHER:

HEMOPHILA IN MOUTH

GPS:

DATE 18JUN98

TAG NOS. T 51134 SPECIES GREEN CCL 87.9 SEX F

PATH NOS. 52

TUMORS	#1	#2	#3	#4	TOTAL	REMARKS
RIGHT EYE						
LEFT EYE						
MOUTH						
NECK						
RIGHT FRONT FLIPPER						
LEFT FRONT FLIPPER						
RIGHT HIND FLIPPER	1					NEAR TAG (NOT @ IT)
LEFT HIND FLIPPER						
CLOACA/TAIL						
SEAMS/SCUTES						
INTERNAL						
TOTAL						

OVERALL TUMOR SCORE: _____

APPROXIMATE TUMOR SIZE CATEGORIES:

#1 = DETECTABLE PATCH TO 1CM DIAMETER
#2 = >1CM TO 4CM
#3 = >4CM TO 10CM
#4 = >10CM

OTHER:

GPS:

DATE 19JUN98

(83)

TAG NOS. T71537 SPECIES GREEN CCL 84.9 SEX F

PATH NOS. #53

TUMORS	#1	#2	#3	#4	TOTAL	REMARKS
RIGHT EYE	1	1			2	
LEFT EYE		3			2	
MOUTH	3					LEFT JAW HINGE
NECK	11	9	2		22	
RIGHT FRONT FLIPPER	39	8	6			
LEFT FRONT FLIPPER	24	11				
RIGHT HIND FLIPPER	30	10	11			
LEFT HIND FLIPPER	41	6	8			
CLOACA/TAIL	8	-	1			
SEAMS/SCUTES	5	3	1			
INTERNAL						
TOTAL						

OVERALL TUMOR SCORE: _____

APPROXIMATE TUMOR SIZE CATEGORIES:

#1 = DETECTABLE PATCH TO 1CM DIAMETER
#2 = >1CM TO 4CM
#3 = >4CM TO 10CM
#4 = >10CM

OTHER:

Orig tagged 1994 "No FPs" C.L.

LEECHES IN JAW HINGE

GPS:

(90) CONTINUED from page 46

MON RE
Dec. 9, 200

Thunder/Lightning CAST Night
Heavy Rain - flooding of low lands - Col said heavi
4 in 50 years! "ROAD TO MONREPOS"

12/9/03 TUESDAY
Meeting started 9AM
Col - Recent
Change to Visual "foxpro in his database syst
Presentation by Limp
ON HIS DATABASE
* Storage and Retrieval (
System.

Cat & Corg in database -- need it in
stranding records,

→ MASTER FILES (for TDPS) Backup — updates every 2 months. Put on CD

ENTER Cause of stranding (coded) into TDPS?

Aboriginal Group — catch & TAG.
Clan
young men
initiation
"SERMONIZE"
A model for Hawaiians (+

Shawn - TDPS Possible?
"COPY what was entered last page" = "AUTO-REPEAT"
12 numbers/letters for Col's PIT tags?
ADD "ENTERED BY"
need Peter Bennett contract
user manual preparation?

Need — TAPE IN
Send Karen ① Reverse Chronology FP Biblio + Full one. ARTHUR DIFSC & other FP necropsy
② Report for review

Aguirre et al
Moreton Symposium paper • + Speaker Hecod Report
EMAIL

Needs — ① TW necropsy paper
② Alonso oral is jaw hinge?
③ Oser, Manual Peter Bennett
④ Denise FB papers
⑥ AV mount to Shaun
⑦ Jeff, ME 2/04 + Milani
④ Space for Milani

91

Thunder
Rain 12/8/03 – 12/09/03 :
– Flooding of Cane Field / Road from Pepos
– More Water in Dunes
15% increase in incubation / emergence success this year due to rain.

Eggs = Pool of Moisture
Drought causes roots to go for eggs to seek moisture.

2PM December 03 Tuesday
Meeting with Karen ARTHUR & Colin regarding Karen's thesis.

12/9 Tuesday
Water (Serous) replaces fat in emaciation — hence not as much change wt vs length.

Need — FB Parker et al. IN Review TO Col / Michelle Boyle

Classmates
363793611 INKHWAI

(92)

For your info: our data base at work. We had our first two turtles nesting at Mon Repos for the season last night -- T89126, a loggerhead that is in her third breeding season who was last recorded nesting in 1999 and X8473, a flatback turtle in her 12th breding season. This girl started her beeding life in 1977 (25 years of breeding history) and we last saw her nesting in December 2001. there are pages of data on her. I will enjoy holding flippers with her when I get back to the beach in a few weeks time.

Need Give video to someone Col & I

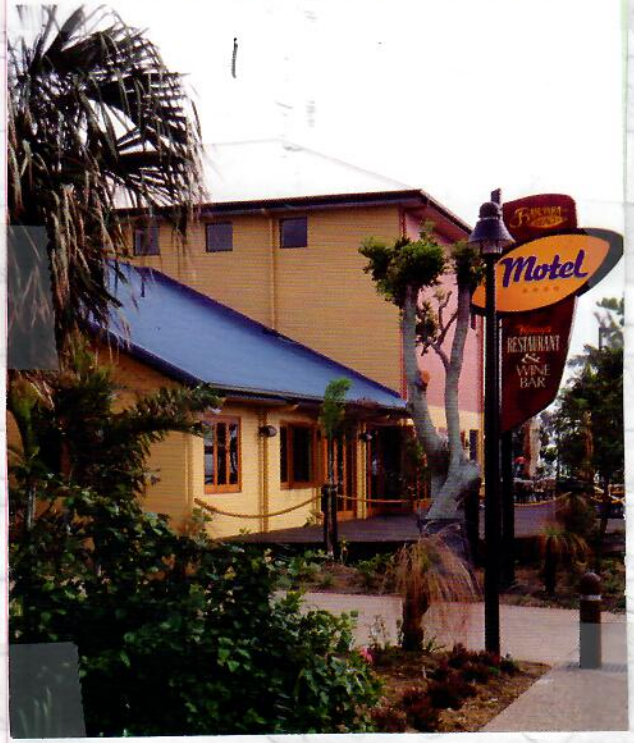
Mon Repos

12/9/03 Wrapped up meeting about 230pm
Tuesday need email followup to Peter Wilson

Meeting w/ Karen, Arthur & Col regarding her thesis work - progress/problems.
She will send me info on Japan Lyngbya researcher so I can use Tori to contact him.
Return to Hotel about 4pm.
Dinner alone at Kacy (hotel) restaurant.
("Atlantis ⟷ Barramundi").
Returned Mon Repos - but closed to the public due to flooded road. Raining still but not heavy. Col led our meeting group on beach to look for turtles (to do ultra sound after nesting).
One emerged, but went back into water because a person from Caravan camp walked behind it.
No other turtles encountered - returned to motel about 11pm.
Video of nest not more than 5 days

(94)

Phone: (07) 4130 1100



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Email: info@bargarabeach.com.au

Need Give video to Someone to film Col & I.

old being preyed upon by a fish took out broken egg (~14) and refilled w/ clean water.
~~Do~~ An opaque disk on top of egg means it (they) can't be safely moved.

12/10/03 Wednesday Slept in until ~9 am - Watched TV (Movie one channel) Philadelphia premiering.
Did email at internet shop. Lunch at Tasya's. Wrote notes. Walked from Bargara to Mon Repos - w/ Gomin only, Nelson Park, waded shallow stream.
www.MEDISON.com got a ride back to Hotel w/ Volunteers.
FAX 82 2 2194-1168
SONOVET 2000

8 PM TO Mon Repos w/ Irene/others except Peter Wilson who left today.
Bought more things at gift shop.
Joined "Group 2" at Amphitheatre - lecture by John. Col called us to the beach - turtle laying. Pictures.
Turtle taken to Research Station in

(96)

THE CHANGE IS YOURS.

IF GAMBLING IS CAUSING PROBLEMS IN YOUR LIFE, YOU HAVE A CHOICE.

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GAME CHANGE

This A.H.A member hotel is committed to providing gaming entertainment safely and responsibly.

12/10/03 Station Wagon, Weighed - U/Tra Sound
Wednesday performed & Demonstrated.
Also - Laproscope demo
Follicles of wrist clock can be seen.
Stayed at beach until ~ 11:30pm.
Driven back to Motel by Col.

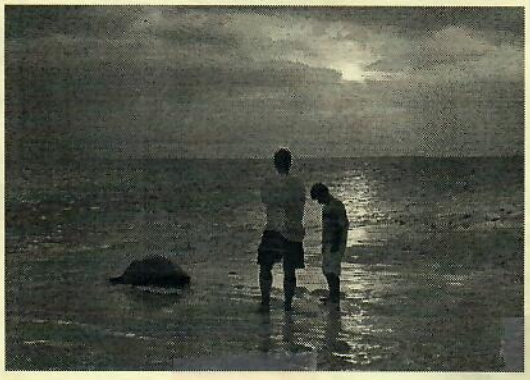
12/11/03 UP ~ 7 Am. Left Motel
Thursday in TAX for airport ~ 8:15 Am.
Flight at 930 A.M. TO Brisbane.
Then jet to Sydney, arrive ~ 1:30pm.
Checked in at Holiday Inn.
Went to The Rocks by train -
walked around + video clips.
Walked to Darling Harbor - to
Aquarium again - Video to 2 turtle
tanks - male has small
head Lake Green, other turtle
presumed female has broad head
Both shells look like
loggerhead but w/ 4 laterals

12/11/03 Dinner at Sausalito, Back
Thursday to Hotel, 12/12/03 Friday
Breakfast at Hotel -
835am shuttle to International
airport terminal,
Depart ~ 10noon are hour delays
due to rain-lightning,
Arrive Honolulu ~ 1215pm 12/12 Friday,

Close Encounters Of The Natural Kind

Heron Island is a significant Green and Loggerhead Turtle rookery. Turtles migrate to Heron Island and other islands in this region to breed at intervals of 4 to 6 years, sometimes longer. Some of these turtles travel from as far away as Indonesia and New Caledonia whilst some travel short distances from Hervey Bay or Moreton Bay. If you wish to have an encounter with one of these magnificent creatures, walk around the beach two hours before or after the evening or very early morning high tide.

Do not use a flash light as light will disturb the turtles. Look for tracks in the sand. Stand a minimum of 15 metres away from the turtles as they make their way up the beach. Sit quietly, at least 5 metres, behind the turtle and you should hear her digging the nest. Once she has stopped digging wait 15 minutes to ensure that she is laying and you will be able to move closer to see her lay eggs. Remember to stay behind the turtle. Once she has finished laying you can sparingly use flash photography. Happy turtle watching!!



AFTERNOON ACTIVITIES

1:30pm FISHING TRIP 3hrs
Book at Marine Centre
Adult $55/Child $40

3:00pm DIVE & SNORKEL BOATS 2hrs
Dive: $48,
Snorkel: Adult $20/Child
Equipment hire extra
Book at Marine Centre

3:00pm REEF CREATURE TALK 45mins
"CORAL, ANEMONES & JELLY
Complimentary/No book
In the Information Centre

3:00pm TURTLE PRESENTATION 45mins
In the Wistari Room
Complimentary/No book

3:15pm SEMI SUBMERSIBLE 1hr
Book at Marine Centre
Adult $30/Child $20

4:30pm BIRD WALK 1.5hrs
Complimentary/No book
Meet at Information Cen

7:00pm EVENING SKY NEWS
In the Wistari Room

8:30pm HAPPY HOUR 1hr
At Baillies Bar

9:00pm MOVIES UNDER the STARS 127mi
"A Knights Tale" RATED PG
On the Wistari terrace

9:00pm MOON CEREMONY
Book at the Information C
Cost: $10 includes plum

OH HAPPY HOUR!

Join us tonight for after-dinner drin
Baillies Bar. The cheerful bar staff w
serving cocktail specials, discounted
and basic spirits between 8:30 pm and
pm.

MORNING ACTIVITIES

8:30am **FISHING TRIP** 3hrs
Book at Marine Centre
Adult $55/Child $40

9:00am **DIVE BOAT—SNGLE & DBLE DIVES**
Book at Marine Centre
Sgle $48/ Dble $96
Equipment hire not included

9:00am **ISLAND WALK** 1.5hrs
Complimentary/No booking
Meet at Information Centre

9:15am **WILSON ISLAND DAY TRIP**
Book at Marine Centre
Adult $78/Child $40

9:30am **SEMI-SUBMERSIBLE** 1hr
Book at Marine Centre
Adult $30/Child $20

9:30am **SNORKEL LESSON** 30mins
Complimentary/No booking
Meet at Resort Pool
Bring along snorkel gear

11:00am **SNORKEL BOAT** 2hrs
Book at Marine Centre
Adult $20/Child $12

11:00am **RESEARCH STATION WALK** 1hr
Complimentary/No booking
Meet at Information Centre

11:30am **REEF CREATURE TALK** 45mins
"CRABS, SHRIMP & BARNACLES"
Complimentary/No booking
In the Information Centre

11:30am **GUIDED SURF SKI TOUR** 1.5hrs
Book at Marine Centre
Max 6 pax (14yrs+)
Cost: $35 per person

Heron Island
1/03 Queensland

[redacted]

(120)

Colorado State University

Diagnostic Laboratories
College of Veterinary Medicine
and Biomedical Sciences
Fort Collins, Colorado 80523-1644
(970) 491-1281
FAX: (970) 491-0320

November 24, 1998

Dr. George Balazs
Natl Marine Fishery Service, NOAA
SW Fisheries Science Center
2570 Dole Street
Honolulu, HI 96822-2396

Dear George:

Please find enclosed the histopathology results and a roughed-out paper for the Australian tumors. The format for the histopathology and the paper are similar to the Costa Rica paper and the Green Turtle paper. The bottom line is that we looked at 101 different tissue samples from approximately 53 turtles. There were 45 tumors and the histological lesions of these tumors were similar to the ones from Hawaii, except that I did not see any evidence of internuclear inclusions. You can refer to the paper and read the details of the different lesions associated with the tumors from the chart for each animal, but they are relatively similar to what we have seen before with the other turtles.

Sincerely,

Terry R. Spraker, DVM/PhD

:ml

Enclosure

xc: Alonso Aguirre/Tufts University/School of Vet Medicine/Wildlife Clinic/
200 Westboro/North Grafton, MA 01536

HISTOPATHOLOGY OF INTEGUMENTAL TUMORS FROM TURTLES FROM AUSTRIAL WATERS

INTRODUCTION

The gross appearance and histopathology of cutaneous fibropapillomas have been described from marine turtles (Green sea turtles) from the Atlantic ocean off the cost of Florida (Elliott and Herbst REF), from Green sea turtles from Hawaii (AA et al) and from Olivey Ridley turtles from Costa Rica (AA/GB). This paper will describe the gross appearance and histopathology of skin masses from sea turtles that were captured from the Australian coast[al] waters of MORETON BAY Queensland

MATERIALS AND METHODS

Turtles were captured in the water, placed in a skiff, sampled and returned to the water. Normal appearing integument and skin masses were biopsies or surgically removed from (number/ages) sea turtles. Technique--Tumors were washed, surgically excised ---(AA/GB). All tissues were immersed in 10% neutral phosphated-buffered formalin. A total of 101 tissue samples were examined from 53?? turtles. Selected tissues were trimmed and embedded in paraffin, sectioned at 5-6 um and stained with hematoxylin and eosin (H&E). Selected tissues were also stained with Masson's Trichrome stain.

RESULTS

Gross Pathology

A total of 53?? turtles were examined from which 101 skin biopsies were surgically removed. All of these turtles were strong and appeared to be health except for the presence of tumors in (*number*) animals. The tumors in these turtles were small, white to gray, smooth to verruciform, raised masses on the integument of the eyelids, mouth, jaw, neck and flippers. Tumors were 10 to 25 mm in diameter and 5 to 20 mm above the skin????? Glottal tumors were not found in these 53 ? turtles. (Were glottal tumors looked for??)

Histopathology

A total of 101 different skin samples were examined histologically. Numerous histological features of the epidermis (Table 1), dermis (Table 2) and subcutaneous tissues (Table 3) OR (JUST TABLE 2) were evaluated in these biopsies. Of these 101 samples 49 were of normal skin, 4 were focal areas of chronic active dermatitis, 3 were old scars and 45 were considered to be tumors.

BIOPSIES OF NON-TUMORED SKIN

The epithelium of the epidermis covering the non-tumored skin was 5 to 10 cells in thickness. Acanthosis characterized by

hypertrophy and hyperplasia of the epithelium of the stratum spinosum from 10 to 20 cells in thickness was found in 29 of 56 skin biopsies. Mild to moderate orthokeratotic hyperkeratosis characterized by hyperplasia of the stratum corneum was found in 17 of 56 skin biopsies. Mild pseudoepitheliomatous hyperplasia characterized by elongation of rete ridges which interdigitates with the underlying connective tissue of the dermis was observed in 4 biopsies. Mild intercellar and intracellular edema was found within the epidermis in 5 and 3 of the skin biopsies. Cytoplasmic vacuolar degeneration was observed in 5 biopsies. Individual cellular necrosis and degeneration were found in one biopsy. Mild infiltration of lymphoid cells was observed in the stratum basale in 3 biopsies. Mitotic figures were not observed. Small focal areas of necrosis associated with underlying inflammation were found within the epidermis in 2 biopsies. Margination of chromatin and intranuclear inclusion bodies were not found in any of the skin biopsies. Acantholysis was not found within the epidermis. Bacteria were found on the surface of the epidermis in 45 biopsies and fungus in 35. Mites were not found on the surface of the epidermis. Small separations or clefts between the dermis and epidermis were observed in one biopsy.

The dermis and subcutaneous tissues in the non-tumored biopsies were similar. There was a thin layer of small collagen bundles just beneath the epidermis. Under this thin layer of collagen was a thick layer of large bundles of collagen. Vessels

cuffed by a few lymphoid cells were found within this deeper collagen layer of dermis and subcutis in 38 biopsies. Granulomas characterized by parasitic ova surrounded by multinucleated giant cells were found within the dermis and subcutis in 7 biopsies.

BIOPSIES OF TUMORS

The epithelium of the epidermis covering the tumors was characterized by acanthosis from 10 to 20 cells in thickness and was found in 33 of 44 tumors (epidermis was not present on one tumor). Mild to moderate orthokeratotic hyperkeratosis was found in 33 biopsies. Mild to moderate pseudoepitheliomatous hyperplasia characterized by elongation of rete ridges which interdigitates into the underlying neoplastic connective tissue of the dermis was observed in 35 biopsies. Mild intercellar and intracellular edema was found within the epidermis of 21 and 19 biopsies respectfully. Mild cytoplasmic vacuolar degeneration was observed in 11 biopsies. Mild individual cellular necrosis and degeneration associated with a mild infiltration of lymphoid cells was observed in the stratum basale of 12 biopsies. Mitotic figures were not observed. Small foci of necrosis associated with underlying inflammation were found within the epidermis in 11 biopsies. Margination of chromatin and intranuclear inclusion bodies was not found in any of the tumors. Acantholysis was not found within the epidermis. Bacteria were found on the surface of 40 tumors, fungus 32 and mites 8. Small separations or clefts between the dermis and epidermis were observed in 8 tumors. Infiltrations of lymphoid cells were observed within the stratum

basale of 30 tumors.

The portion of tumor located within the dermis predominated and was characterized by a proliferation of plump spindle shaped cells of fibroblastic or mesenchymal origin. Three patterns of growth were observed: nodular, papillary and linear. The most common patterns were the nodular and papillary. The nodular pattern was characterized by a smooth raised rounded mass. The papillary pattern was characterized by small papillary projections of epidermal and fibroblastic tissue over a fibrovascular stalk or core. The linear pattern was more of a plaque or linear area of dermal proliferation located just beneath the epidermis. This linear pattern was also present around the edges of many papillary tumors. The pattern of dermal proliferation in the smaller tumors was usually the nodular or linear pattern, whereas with the larger tumors, the pattern was more likely to be papillary.

The cellular architecture of the fibroblastic portion of tumors was a relatively haphazard arrangement of whorls, fascicles and interweaving bundles of proliferating spindle shaped fibroblastic cells. In some areas the interweaving bundles were thin and tightly interwoven, whereas in other areas the interweaving fascicles were in wide bands. The degree of dermal cellularity was relatively low in 9 tumors and moderate in 36. Mitotic figures were not observed in any of the tumors. Mild neovasculation was found in 6 tumors. Vessels within 27 tumors were cuffed by a thin layer of lymphoid cells. Foci of necrosis were not found within any of the tumor biopsies.

Pigment due to melanocytic activity was found to some degree in 17 tumors. Masson's trichrome stain verified tumors to be composed of fibroblastic cells producing collagen. Granulomas composed of a few multinucleated giant cells surrounding parasitic ova were observed within 21 tumors. Keratin pearls characterized by small circular foci of keratin surrounded by a thin layer of epidermal cells were found within 4 tumors. The margins of all tumors showed evidence of spread by expansion and not infiltration into surrounding tissues. Tumors showed no evidence of regression.

Changes in the underlying dermis and subcutis were characterized by mild to moderate lymphoid cuffing of vessels in 17 of 21 tumor biopsies. Granulomas containing parasite ova were observed within the underlying dermis and subcutaneous tissues in 4 of 21 tumor biopsies. Fibroblastic hyperplasia was not a feature of the underlying connective tissue surrounding tumors (Table 2 or 3).

Discussion

Histological features of 101 biopsies of the integument from 53 sea turtles from Australian waters were examined. The basic histological features of these skin tumors were cutaneous fibropapillomas. These fibropapillomas from this species of sea turtle were basically similar to what has previously been described for cutaneous fibropapillomas in sea turtles off the Florida coast (H/EJ), Hawaiian Islands (AA/GB) and Costa Rica (AA/GB). A few minor differences were found. One difference was

that intranuclear inclusion bodies were not observed in this set of 45 tumors from Australian turtles. Also in these 45 tumors there were no evidence of regression in any of the biopsies. One difference noticed in biopsies of non-tumored skin was a high prevalence of acanthosis and orthokeratotic hyperkeratosis. This may have been due to the high prevalence of bacterial and fungal organism living on the surface of non-tumored skin.

This histopathological study of integumental biopsies of skin and cutaneous masses of Australian sea turtles suggest that these turtles do have cutaneous fibropapillomas similar to Green sea turtles from Hawaii.

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Table 1. Summary of normal and histopathological features of epidermis of 56 non-tumored skin biopsies and 44 integumental tumors of sea turtles from Australian waters.

	Non-tumored Skin	Tumored Skin
Pattern of tumor		
Nodular/smooth	NA	23 (52%)
Papillary	NA	18 (41%)
Linear	NA	4 (9%)
Epidermis		
Acanthosis	29 (52%)	37 (84%)
Orthokeratotic hyperkeratosis	17 (30%)	33 (75%)
Pseudoepitheliomatous hyperplasia	4 (7%)	34 (77%)
Intercellular edema	5 (9%)	21 (48%)
Intracellular edema	3 (5%)	19 (43%)
Cytoplasmic vacuolar degeneration	5 (9%)	11 (25%)
Individual cell necrosis	1 (2%)	12 (27%)
Mitotic figures	0 (0%)	0 (0%)
Necrosis (full depth) with underlying inflammation	2 (4%)	11 (25%)
Margination of chromatin with intranuclear inclusions	0 (0%)	0 (0%)
Acantholysis	0 (0%)	0 (0%)
Lymphocytic infiltration, st. basale	3 (5%)	30 (68%)
Bacteria, surface of epidermis	45 (80%)	40 (91%)
Fungus & algae, surface of epidermis	35 (63%)	23 (52%)
Mites, surface of epidermis	0 (0%)	8 (18%)
Trematodes, surface of epidermis	0 (0%)	0 (0%)
Clefts between epidermis and dermis	1 (2%)	8 (18%)

Table 2. Summary of normal and histopathological features of the dermis of 56 biopsies from non-tumored skin and 45 integumental tumors from sea turtles from Australian waters.

	Non-tumored Skin	Tumored Skin
Fibroblastic proliferation patterns		
Haphazard	NA	45 (100%)
Sheets	NA	0 (0%)
Interweaving bundles	NA	0 (0%)
Cellularity of tumor		
Low	NA	9 (20%)
Moderate	NA	36 (80%)
High	NA	0 (0%)
Mitotic figures	0 (0%)	0 (0%)
Neovasculation in tumor		
Low	NA	6 (13%)
Moderate	NA	0 (0%)
High	NA	0 (0%)
Vessels cuffed with lymphocytes	38 (68%)	27 (60%)
Foci lymphocytic inflammation	0 (0%)	10 (22%)
Foci of necrosis	0 (0%)	0 (0%)
Pigment, melanin	46 (82%)	17 (38%)
Granulomas containing parasitic ova	7 (13%)	21 (47%)
Keratin pearls	NA	4 (9%)
Margins		
Spread by expansion	NA	45(100%)
Spread by infiltration	NA	0 (0%)
Regressing	NA	0 (0%)

Table 2. Summary of histopathological features of the dermis and subcutis of 56 biopsies from non-tumored skin and 45 integumental tumors from sea turtles from Australian waters.

	Non-tumored Skin	Tumored Skin
DERMIS		
Haphazard fibroblastic pattern	NA	45 (100%)
Cellularity of tumor		
Low	NA	9 (20%)
Moderate	NA	36 (80%)
High	NA	0 (0%)
Mitotic figures	0 (0%)	0 (0%)
Neovasculation in tumor, mild	NA	6 (13%)
Vessels cuffed with lymphocytes	38 (68%)	27 (60%)
Foci lymphocytic inflammation	0 (0%)	10 (22%)
Foci of necrosis	0 (0%)	0 (0%)
Pigment, melanin	46 (82%)	17 (38%)
Granulomas containing parasitic ova	7 (13%)	21 (47%)
Keratin pearls	NA	4 (9%)
Margins		
Spread by expansion	NA	45 (100%)
Regressing	NA	0 (0%)
SUBCUTANEOUS TISSUE		
Vessels cuffed with lymphocytes	38 (68%)	17/21(81%)
Granulomas containing parasitic ova	7 (13%)	4/22(18%)

Table 3. Summary of normal and histopathological features of the subcutaneous tissues of 56 skin biopsies and 45 integumental fibropapillomas of sea turtles from Australian waters.

	Normal skin	Tumors
Subcutaneous tissues		
Deep fibroblastic reaction	0 (0%)	0 (0%)
Vessels cuffed with lymphocytes	38 (68%)	17/21 (81%)
Granulomas containing parasitic ova	7 (13%)	4/22 (18%)

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Colorado Veterinary Diagnostic Laboratory
College of Veterinary Medicine and Biomedical Sciences
Colorado State University, Fort Collins, CO 80523
Phone: 970-491-1281 Fax: 970-491-0320

DL#: 989-23367
Date: 12/23/99

Vet/Clinic: George Balazs/National Marine Fisheries Service
Owner: NA
Animal ID: NA **Date Specimen Taken:** NA
Species: Australian Sea Turtles **Breed:** NA **Age:** NA **Sex:** NA

History: Submitted are 24 skin biopsies from sea turtles from Australia. All of these samples have been fixed in 10 percent neutral buffered formalin.

HISTOPATHOLOGY: Sample 7 - Normal skin.

Sample 27.1 - Fibropapilloma.

Sample 27.2 - Fibropapilloma.

Sample 30.A - Normal skin.

Sample 30.B - This section is of an extremely early tumor. It is characterized by acanthosis with extremely early pseudoepitheliomatous hyperplasia. There is extensive serocellular crusting on the surface of the epidermis. The degree of fibroplasia within the dermis is considered moderate and of the flattened type of pattern of tumors.

Sample 30.C - Early fibropapilloma with a flattened tumor pattern.

Sample 32 - Normal skin.

Sample 36.1 - Normal skin.

Sample 35 - Fibropapilloma, papillary pattern.

Sample 36.2 - Tissue too small, no diagnosis.

Sample 39.T - Fibropapilloma, papillary pattern.

Sample 40.1 - Normal skin.

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Sample 40.2 - Tissue too small, no diagnosis.

Sample 41/44 - Normal skin.

Sample 42 - Normal skin/severe hyperkeratosis with numerous fungal agents, no evidence of tumor in this tissue.

Sample 44.T2 - Fibropapilloma, large.

Sample 46 - Fibropapilloma, flattened pattern but has no pseudoepitheliomatous hyperplasia. It could have been a piece of relatively large nodular smooth type of tumor.

Sample 48.T - Fibropapilloma, large mass.

Sample 50.T - Fibropapilloma, large mass. Pseudoepitheliomatous hyperplasia not present within biopsy.

Sample 52 - Four pieces of tissue are on this slide. Two of them are normal skin and two of them are of a large fibropapilloma. The sections of fibropapilloma do not have pseudoepitheliomatous hyperplasia.

Sample 53 - Severe dermatitis associated with some type of organism. I can't tell what kind of organism it is but it is relatively large and somewhat suggestive of algal growth or some kind of plant life growing on the surface of this turtle, but there is no evidence of tumor in the skin.

Sample 53.1 - Fibropapilloma with both papillary and flattened patterns.

Sample 53.2 - Normal skin.

Sample 53.3 - Fibropapilloma, papillary pattern.

TRSpraker

Terry R. Spraker, DVM/PhD

Typed: 2/5/99 ea

(32)

* Shawn K. K. Murakawa *
* JIMAR Research Associate *
* Marine Turtle Research Program *
* National Marine Fisheries Service *
* 2570 Dole Street *
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* (808) 983-5731/Fax: (808) 983-2902 *
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---------- Forwarded message ----------
Date: Wed, 20 Jan 1999 23:17:23 -1000 (HST)
From: George H. Balazs <gbalazs@honlab.nmfs.hawaii.edu>
To: Shawn Murakawa <smurakaw@honlab.nmfs.hawaii.edu>
Subject: Re: None (fwd)

Please print everything here that you can.

* George H. Balazs, Leader *
* Marine Turtle Research Program *
* National Marine Fisheries Service *
* SWFSC Honolulu Laboratory *
* 2570 Dole Street *
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* gbalazs@honlab.nmfs.hawaii.edu *

---------- Forwarded message ----------
Date: 21 Jan 1999 10:59:40 +1000
From: Sylvia Spring <sylvia_spring@gbrmpa.gov.au>
To: "George H. Balazs" <gbalazs@honlab.nmfs.hawaii.edu>
Subject: Re: None

RE>None 21/1/1999

Dear George

Thank you for your email - on Christmas Day no less. I hope you had a relaxing Christmas and New Year. I have just returned to work after a three week break. Yes I do remember Richard Shomura - please give him my regards.

Glad you thought my note for MTN was useful. I have attached for you, a copy of a map showing the tagging and the recovery locations. There were 20 satellite hits- 8 around Ashmore (1 LOC 1, the rest LOC 0) and 12 in and around Snake Bay on Melville Island (1 LOC 1 and the rest LOC 0). The results that I had from the Heron Island green turtle were much better - I am writing another short note for MTN re the fate of that turtle and will send you a copy when I have finished it - which should be well before your Malaysian meeting. Would be thrilled if you could include my work in your global overview as not many people are aware of my results. I would love to do some more satellite work - I see that Col is getting into it now.

Must fly

Regards Sylvia

S.Spring@gbrmpa.gov.au

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Tag Recovery Supports Satellite Tracking of a Green Turtle

C. Sylvia Spring[1] & Desmond Pike[2]

[1]*Great Barrier Reef Marine Park Authority, GPO Box791, Canberra ACT 2601, Australia (E-mail: s.spring@gbrmpa.gov.au)*

[2]*Environment Australia, GPO Box 1260, Darwin NT 0801, Australia (E-mail: Des.Pike@dest.gov.au)*

N.T. 1998

On 7 June 1990, a Platform Terminal Transmitter (PTT 5347) was attached to a post-nesting green turtle at West Island in the remote Ashmore Reef National Nature Reserve which lies in the Timor Sea off the North West Coast of Australia (Spring 1994; Figure 1). The turtle was also tagged with two titanium tags from the Western Australian Department of Conservation and Land Management (WACALM). The aim was to track the movements of green turtles from the nesting beach on Ashmore Reef to provide a better understanding of post-nesting migration for management purposes.

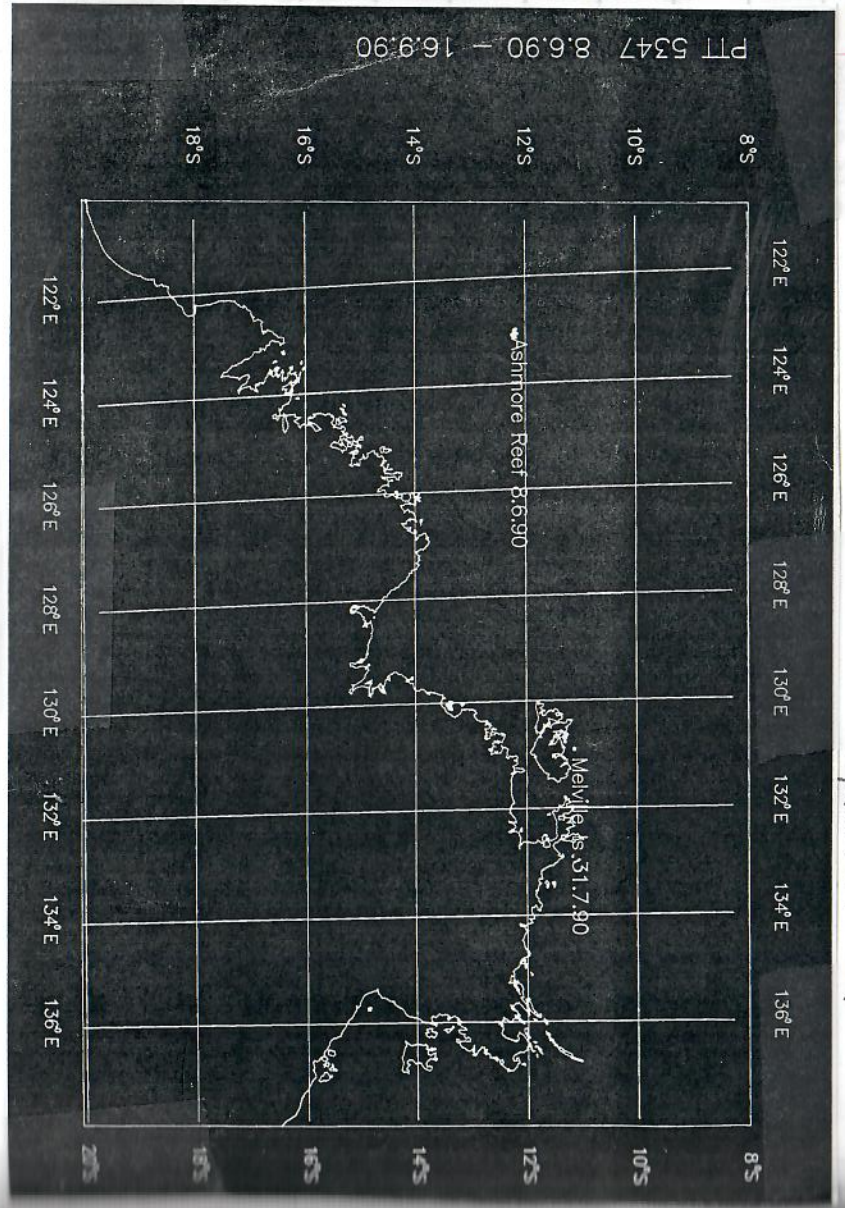
The turtle's movements were tracked over a period of 3 months before transmissions ceased. During this time, satellite data indicated that the turtle travelled over 900 km from Ashmore Reef to Melville Island in the Northern Territory. The turtle remained at Melville Island for 48 days with the last message recorded on 17 September 1990. Positions were calculated using class 0 locations or better.

The fate of the turtle and the PTT remained a mystery until early 1998 when the two titanium tags were returned to WACALM by a police officer who had been working in the Northern Territory. It appears that the tags were handed to the officer by a local resident whilst he had been undertaking a patrol to the Snake Bay community on Melville Island in 1991. There had been no mention of the PTT being attached to the turtle when the tags were handed over, but the fact that both tags were retrieved would indicate that the animal had probably been caught for consumption by community members.

The recovery of the tags from Snake Bay provides further evidence that the turtle was in the area indicated by the last PTT records. The last data recorded by satellite were 12 reports in and around sea grass beds in Snake Bay in very close proximity to the Snake Bay community.

SPRING, C.S. 1994. Satellite Tracking Green Turtles in Australian Waters - Preliminary Results. Proceedings of the Australian Marine Turtle Conservation Workshop held at Sea World Nara Resort, Gold Coast, 14-17 November 1990: Queensland Department of Environment and Heritage and the Australian Nature Conservation Agency. pp.192-197.

Report issued =



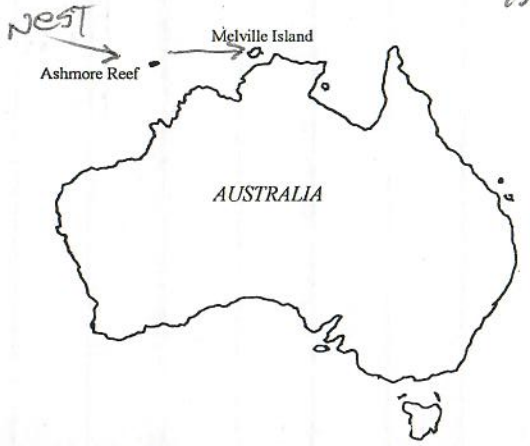
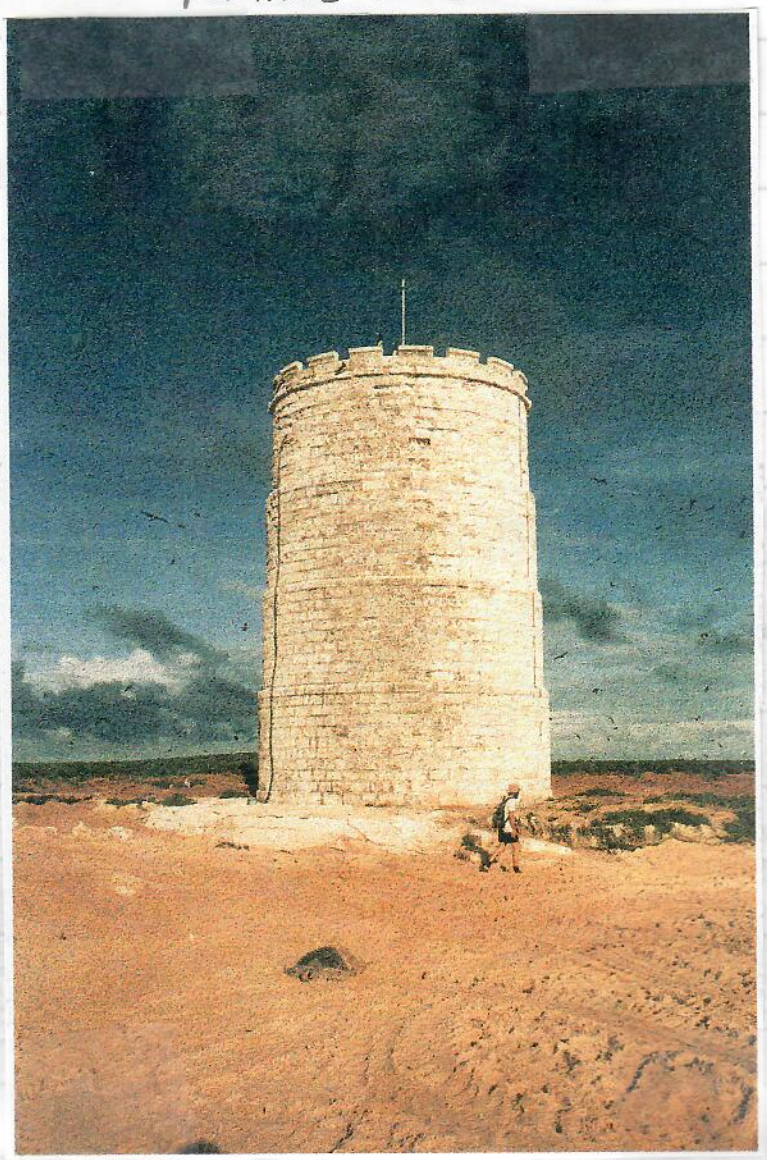


Figure 1. Study site: Ashmore Reef and Melville Island.

SYLVIA SPRING

RAINE ISLAND



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RAINE ISLAND