

Extract (written soon before 31/7/1997) from a 1995 Field Notebook of GBP that refers to planned meeting (see 24/7/1997 below) of JL, GBP & ACI re 1995 work. GBP has written, inter alia: 'Marmion Depth 110 {77, 88} 108 {220, 112}'. Presumably these are water depth calculations (subtractions) using measurements (in cm & mm) made by GBP at a post (posts?) at Lake Marmion in June 1995.

3/17/97

BALLARD MORMON Assessment
TAKL A low GP

0900 -

Need. Photos of Mormon colony

MORMON Depth

110 { 77 } 220 } 108
{ 88 } 112 }

MORMON

29 47

121 33

Re label + date all photos of
Ballard + Mormon

Get photos in right sequence
+ date them as well as
possible
Tom will go thru +
label.

10.05
12.00
10.20

10
10
10

Extract from a 1995 Field Notebook of GBP that reads ‘Salinity data’ and 14/9/95 [14/9/1995] 88.3%. This was probably a water sample taken by GBP at Lake Ballard on that date. Is there another GBP Field Notebook (or report) referring to GBP’s visit to Lake Ballard on 14/9/1995? See 29/8/1995 below. See also ‘23/7/1997’; ‘Copy [12/2/1996] of Report ...’; and ‘Folio 9 (Vol.5) of JL’s BaSt files ...’ below.

JL thinks (05/4/2014) that this field notebook entry was actually made by GBP soon before 31/7/1997 as it refers to that date and is in the same biro and hand-writing as the next page of that date, see above.

Security data

14/9/95 18.39

Refer discussion

Tom on South Trust 3/17
Approved 1300 Jan

Disc Number Ballard
Protec markers

Fax (24/7/1997) from JL (at Busselton) to GBP & ACI (at Woodvale) arranging for all three to meet at Woodvale 'next Thursday' [31/7/1997] to sort out the Ballard, Crossover lake and [Lake] Marmion invertebrate sweep samples ... [collected in 1995] ...' and to have all relevant research materials on hand '... so that we can clear up all uncertainties before discussing with Andrew Storey [UWA-associated aquatic invertebrate specialist, see phone message of 22/8/1997 above] how they are to be analysed and a price'. ACI was also to 'obtain and fax to me the monthly evaporation rates for Lake Ballard from the Met Bureau' (done, see above).

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
BUSSELTON DISTRICT

FAX NO: (097) 521 432

76.

A copy to each file

TO: *G. PEARSON / A. CLARKE* URGENT: YES / NO

AT: *WOODVILLE*

FAXED

..... Fax No.

FROM: *JIM LANE*

DATE: *24/7/97*

Your Ref:

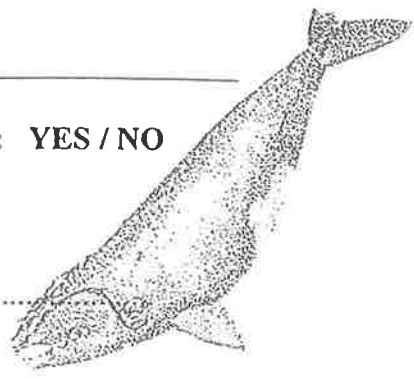
Local Ref:

.....
.....
.....
.....

No. of pages inc. this page: *2*

Please call us on (097) 521 677 if this message was incomplete or illegible

[Signature]
Jim Lane
24.7.97



**TO: GRANT PEARSON
ALAN CLARKE**

SUBJECT: BANDED STILT DATA FOR THURS 31 JULY AT WOODVALE

In addition to sending me this week any info I requested in a fax to you on 11 July that hasn't already been sent, please do the following:

1. Alan: obtain and fax to me the monthly evaporation rates for Lake Ballard from the Met Bureau.
2. Grant and Alan: when we meet at Woodvale next Thursday to sort out the Ballard, Crossover lake and Marmion invertebrate sweep samples and gut samples, please have all relevant data, field notes, reports, photographs, etc. with you so that we can clear up all uncertainties before discussing with Andrew Storey how they are to be analysed and a price.
3. Alan: please book the Woodvale small meeting room for the day. On the day please set up a computer so that I can compile the info from 2. above as we go.

Ring me if any queries.



Jim Lane
24.7.97



Fax (23/7/1997) from JL to CDTM indicating that: 'I am currently working on the water level and water quality data from Lake Ballard'. JL asks whether CDTM has any other (in addition to 14/4/1995) depth records for Ballard – in particular from the stick installed (on 15/3/1995) on the south side of Camp Island, and did CDTM visit Ballard in 1996. Note JL also writes that the logger data '... from the period 10 June [10/6/1995] to 14 September [14/9/1995] (when the recorder was retrieved [by GBP]) will be added [to the attached graph] next week.

FAXED

70.
2 page fax

TO: CLIVE MINTON

SUBJECT: THE 1995 BANDED STILT WORK AT BALLARD & MARMION

In order to make some progress with this I have decided to work on the data and write it up section by section, fitting it in as best I can around other commitments. As I complete draft sections I will send them to you for comment / corrections / input etc.

I am currently working on the water level and water quality data from Lake Ballard.

My rough notes of a phone call you made to me from Broome Bird Observatory and a fax you sent to me on 24/4/95 indicate that at 4pm on 14 April ("four days after rain which added 13cm to the lake") the water depth at the marker beside Camp Island was 51cm.

Do you have any other depth records for Ballard?


In particular, do you have any post 15 March 1995 observations of the water level in relation to the small stick we positioned at the water's edge on the south side of Camp Island on this day (day of visit by helicopter)?

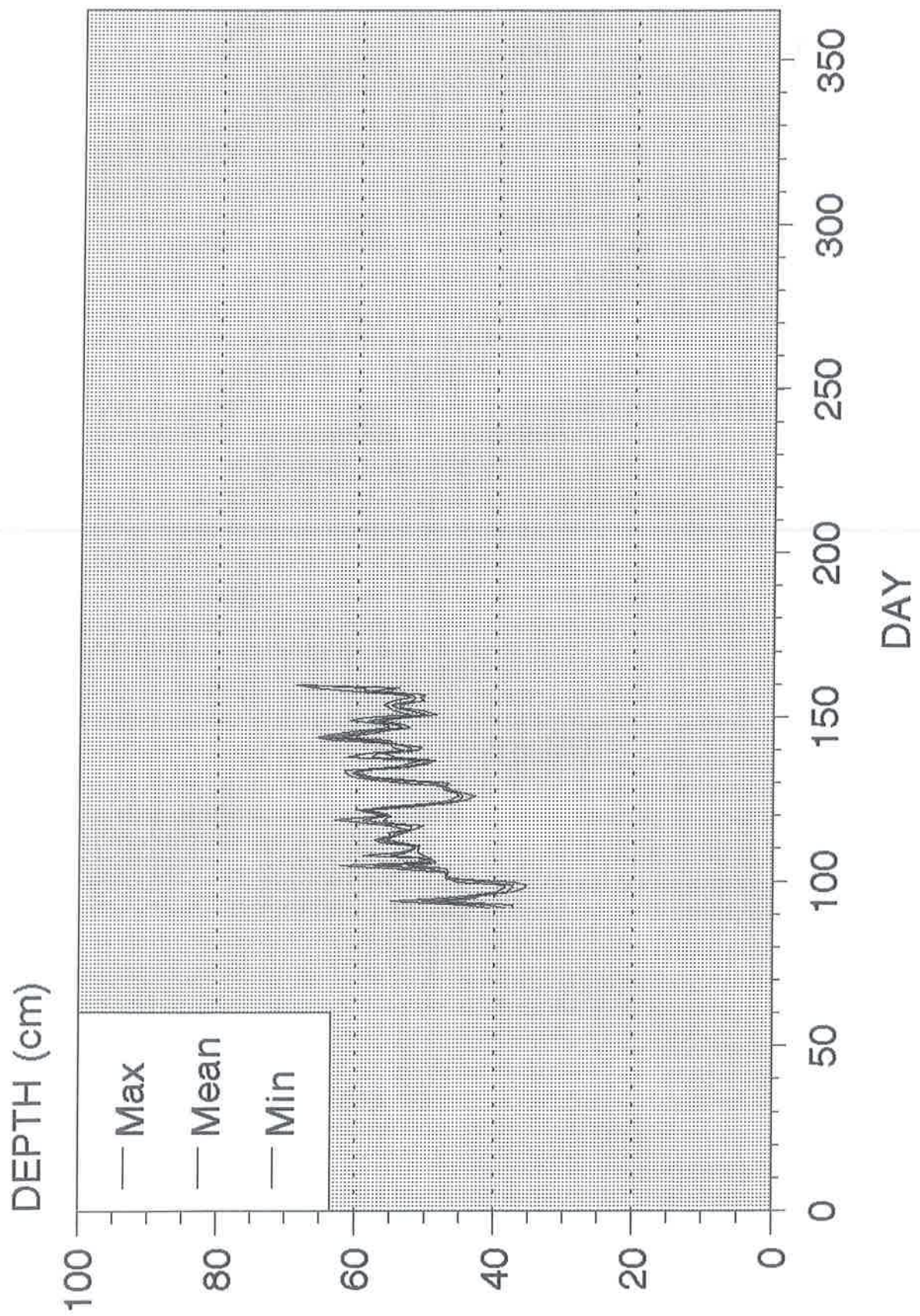
Also, did you visit Lake Ballard in June or July 1996, as at one stage you thought you might? If so, I assume it was dry (?)

For interest, attached is a graph of the 2 April to 9 June data from the continuous water level recorder that Grant installed on 1 April. The data from the period 10 June to 14 September (when the recorder was retrieved) will be added next week.

Thanks for your help with this.

Best wishes to you and Pat.


Jim Lane
23 July 1997.



LAKE BALLARD 1995: Depth, salinity, etc.



Tables (faxed 22/7/1997, from ACI/GBP to JL) detailing all the gut and sweep samples collected at Lakes Ballard and Marmion (and Crossover Lake – sweep samples only) in 1995. There is also a map of Lake Ballard annotated by ACI that inter alia indicates where ‘most birds [BaSt] taken [collected]’ and ‘Dist. between Tripod & Camp [Islands] 16km’. The Tables have many important annotations and some corrections by JL, ACI and or GBP. See further above for revised versions.

These are the same or similar to the Tables used in 2005 (see above). The Lake Ballard Tables are the same as those first sent to JL by ACI on 30/1/1996 (see below).

NOTE G.P. should have a rough location of where the birds were taken on Lake Ballard.

LAKE BALLARD 1995
BANDED STILT GUT CONTENTS AND SWEEP SAMPLES

Date	Site	Bird	Contents	Vials	Sweep	Vials	Comments
02/04/95		✓ adult 1 ♀	gizz	1			
		✓ adult 2 ♂	gizz	1			
		✓ adult 3 ♂	gizz	1			
		✓ adult 4 ♂	gizz	1			
		✓ adult 5 ♂	gizz	1			
		✓ adult 6 ♂	gizz/oes	1			
		✓ adult 7 ♂	gizz/oes	1			
		✓ adult 8 ♂	gizz/oes	1			
		✓ adult 9 ♂	gizz	1			
					1 (x50min)	1	one sweep in one vial for birds 1-9
		✓ adult 10 ♂	gizz	1	1	1	
		✓ adult 11 ♂	gizz	1	1	1	
		✓ adult 12 ♀	gizz	1	1	1	
10/04/95	depth sound at Camp 2 *	family 1			1	1	no gizzard or oes. check GP's notes
11/04/95		family 2	gizz	1	1	1	400m W of Colony 2
		family 3	gizz	1	1	1	between Colony 1 and 2
		family 4	gizz	1			" " " "
		family 5	gizz	1	1	1	Sweep for family 4 & 5 in one vial
02/05/95		✓ adult 1	gizz/oes	2			
		✓ chick c1	gizz/oes	2			
		✓ chick c2	gizz/oes	2			
					1	2	
		adult 2					missing, presume escaped shot?
		✓ chick 2a	gizz/oes	2			
		✓ chick 2b	gizz/oes	2			
		✓ chick 2c	gizz/oes	2			
					1	1	other vial damaged
		✓ adult 3	gizz/oes	2			
		✓ chick 3a	gizz/oes	2			
		✓ chick 3b	gizz/oes	2			
		✓ chick 3c	gizz/oes	2			
					1	2	other vial damaged
		✓ adult 4	gizz/oes	2			
	✓ chick 4a	gizz/oes	2				
				1	2		
	✓ adult 5	gizz/oes	2				
	✓ chick 5a	gizz/oes	2				
				1	2		

Should be 3 birds in each (Sal. & gizz)
1 oes. sample for each
1 oes. depth for each

GP should have 9 ♂, 3 ♀
I took photo of each bird.

see WTM's notes (Feb 95)

Mrs Amy + Allen

Major water
Allen saw

to bring between second colony + second island
to bring between second colony + second island
Confirmed from this diary

no vial (small 2 vials)

* No family of 1 adult and 3 chicks - all single gone missing

LAKE BALLARD 1995
INVERTEBRATE SWEEPS AT CAMP ISLAND AND CROSSOVER LAKE

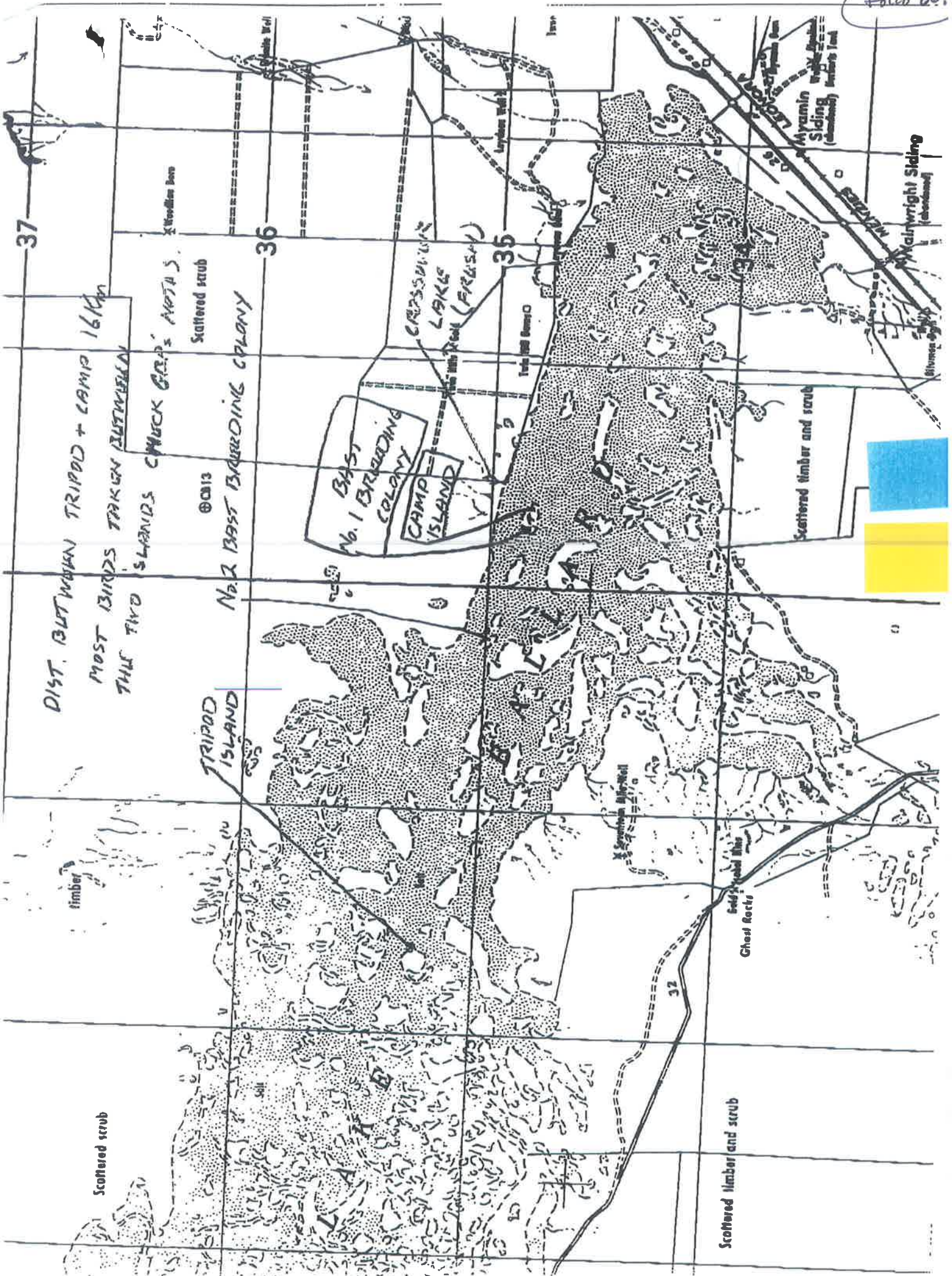
Date	Site	Sweep No.	Vials	Comments
15/03/95	Camp Island	1	1	250um net was used
01/04/95	Camp Island	1	1	110um net was used
		2	1	
		3	1	
01/04/95	Crossover Lake	1	1	It seems 2 lots of samples were taken for this date. check GP's notes
		2	1	
		3	1	
		1	3	
09/04/95	Camp Island	1	1	
		2	1	
		3	1	
11/04/95		1	1	
		2	1	
		3	1	
28/04/95		1	2	
		2	2	
		3	2	
04/05/95		1	2	
		2	1	2nd vial damaged
		3	2	
09/06/95		1	2	
		2	2	
		3	2	
09/06/95	Crossover lake	1	4	

most net size used.

↑ why more than one vial per sweep in some dates?

Get copies of GP, AC + comments original field notes for all managers + birds collected

folio 66.



DIST. BETWEEN TRIPPOD + CAMP 16 Km
 MOST BIRDS TAKEN BETWEEN
 THE TWO ISLANDS CHECK GEAR NOTES.
 Scattered scrub

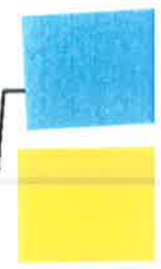
No. 1 BREEDING COLONY
 CAMP ISLAND

TRIPPOD ISLAND

CROSSIN'S LAKES
 (FRUSHY)

Scattered timber and scrub

Scattered timber and scrub



Fairwright Siding (abandoned)

Myramin Siding (abandoned)

Ghost forests

32

35

36

37

Woodhill Barn

Iron Hill Barn

Scrubland Myrwell

timber

Scattered scrub

33

32

35

36

37

NEW COLLIER
 OES CHECKED,
 BUT EMPTY / OF GIZZ OES EMPTY

LAKE BALLARD 1995
 BANDED STILT GUT CONTENTS AND SWEEP SAMPLES

Date	Site	Bird	Contents	Vials	Sweep	Vials	Comments
02/04/95		adult 1	gizz	1			OES EMPTY
		adult 2	gizz	1			OES EMPTY
		adult 3	gizz	1			OES EMPTY
		adult 4	gizz	1			OES EMPTY
		adult 5	gizz/oes	X 2			FOLLICUL
		adult 6	gizz/oes/c	X 2			
		adult 7	gizz/oes	X 2			
		adult 8	gizz/oes/c	X 2			
		adult 9	gizz	1			OES ?
					1	1	one sweep in one vial for birds 1-9
		adult 10	gizz/oes/c	X 2	1	1	
		adult 11	gizz/oes/c	X 2	1	1	
		adult 12	gizz/oes/c	X 2	1	1	FOLLICUL
10/04/95		family 1			1	1	no gizzard or oes. check GP's notes
11/04/95		family 2	gizz	1	1	1	
		family 3	gizz	1	1	1	
		family 4	gizz	1			
		family 5	gizz	1	1	1	Sweep for family 4 & 5 in one vial
02/05/95		adult 1	gizz/oes	2			
		chick c1	gizz/oes	2			
		chick c2	gizz/oes	2			
					1	2	
		adult 2					missing, presume escaped shot?
		chick 2a	gizz/oes	2			
		chick 2b	gizz/oes	2			
		chick 2c	gizz/oes	2			
					1	1	other vial damaged
		adult 3	gizz/oes	2			
		chick 3a	gizz/oes	2			
		chick 3b	gizz/oes	2			
		chick 3c	gizz/oes	2			
					1	2	other vial damaged
		adult 4	gizz/oes	2			
		chick 4a	gizz/oes	2			
					1	2	
		adult 5	gizz/oes	2			
		chick 5a	gizz/oes	2			
					1	2	

FOLLICUL



LAKE MARMION 1995
 BANDED STILT GUT CONTENTS AND SWEEP SAMPLES

Date	Site	Sweep No.	Vials	Comments
10/06/95	Depth Post	1	1	110um net
13/06/95		1	1	
13/06/95	Breeding Colony	1	2	

2 sweep

Date	Site	Bird	Contents	Vials	Sweep	Vials	Comments
11/06/95		adult 1	gizz/oes	2			
		chick 1	gizz/oes	2			
		chick 2	gizz	1			
		chick 3	gizz/oes	2			
		chick 4	gizz/oes	2			
		chick 5	gizz/oes	2			
					1	2	
		Stilt No.1	gizz/oes	2			are these two birds
		bast no.2	gizz/oes	2			failed attempts ?
12/06/95		adult 2	gizz/oes	2			
		chick 2a	gizz	1			
		chick 2b	gizz/oes	2			
		chick 2c	gizz/oes	2			
					1	1	
		adult 3	gizz/oes	2	1		
		chick 3a	gizz/oes	2			
		chick 3b	gizz	1			
					1	3	
		adult 4	gizz/oes	2			
		chick 4a	gizz/oes	2			
		chick 4b	gizz/oes	2			
		chick 4c	gizz/oes	2			
							Sweep missing ?
		adult 5	gizz/oes	2			
		chick 5a	gizz/oes	2			
		chick 5b	gizz/oes	2			
					1	2	

2 sweep

3 sweep

2 sweep

1 sweep

HOW FAR AWAY FR OTHER STILTS

7 sweep

12

7 sweeps

Fax (11/7/1997) from JL to ACI & GBP asking if they ever made any water level observations using the stick that was used to mark the water's edge on the south side of Camp Island on 15/3/1995, and for copies of the Lake Ballard (1995) water analyses (salinity and nutrients) results. Also, JL asks GBP to '... send me a copy of the data from the data logger from 9 June [1995] to when you retrieved it on (16?) September 1995'. A graph of Lake Ballard water logger data to c.09/6/1995 is attached (note that this was named and located at 'C: BANSTILT\BALDEPTH\ball1995.ch3'.

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
BUSSELTON DISTRICT
FAX NO: (097) 521 432

630

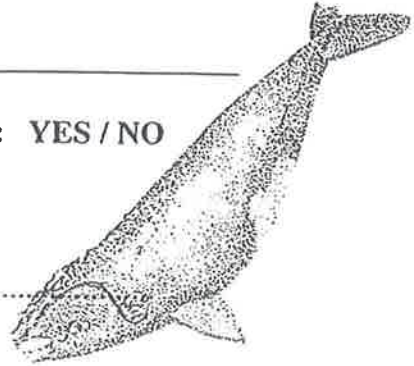
FAXED

TO: ALAN CLARKE / GRANT PEARSON URGENT: YES / NO

AT: WOODVILLE

FROM: JIM LANE

Fax No.



DATE: 11/7/97

Your Ref:

Local Ref:

No. of pages inc. this page: 3

TO: GRANT PEARSON

SUBJECT: AS ABOVE


1. Would you please send me a copy of the data from the data logger from 9 June to when you retrieved it on (16?) September 1995.
2. Please also check your records for the info referred to at 2. above. This is the only way we can determine what the water level was on 15 March.
3. If Alan doesn't have the salinity and nutrients data (i.e. results of analyses by WA Chem Centre), presumably you do.


JimL
11.7.97

TO: ALAN CLARKE

SUBJECT: LAKE BALLARD

1. Would you please obtain from the Bureau of Meteorology the 1995 **daily rainfall** records from Menzies, Cashmere Downs, Diemals and any other rainfall recording stations (if they exist) *closer* than these to Lakes Ballard, Barlee and Marmion. Hardcopy will do.
2. Please check your notebooks, files etc. to see whether you ever made any observations concerning the water level on the south side of Camp Island **relative to the stick that Grant, Clive and I stuck in the ground (and wound some red? tape around) at the water's edge when we first visited (by helicopter) on 15 March 1995.** If you did (though this is unlikely, as you probably didn't know of its existence) would you please send to me.
3. If you have the results of any water analyses (**salinity and nutrients**) from Ballard in 1995 - or you know where they are - please send photocopies to me. I think I have all your pH measurements.
4. Attached for interest is a copy of the water level data from the logger, from 2 April to 9 June 95.


 Jim Lane
 11.7.97

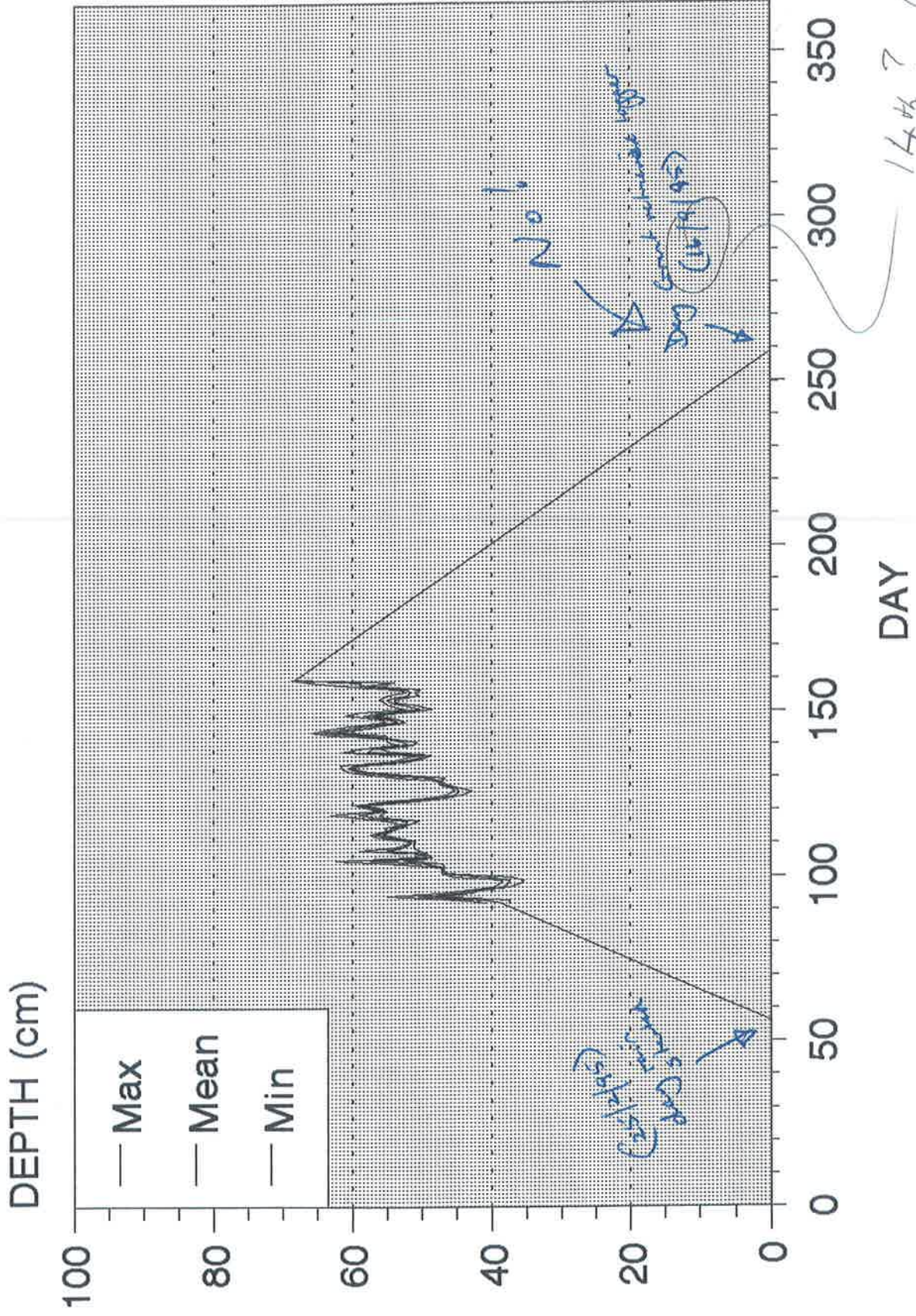
TO: GRANT PEARSON

SUBJECT: AS ABOVE

1. Would you please send me a copy of the data from the data logger from 9 June to when you retrieved it on (16?) September 1995.
2. Please also check your records for the info referred to at 2. above. This is the only way we can determine what the water level was on 15 March.
3. If Alan doesn't have the salinity and nutrients data (i.e. results of analyses by WA Chem Centre), presumably you do.


 JimL
 11.7.97

C: JANSZUR (ANDEPETH) bull 1995. ch 3



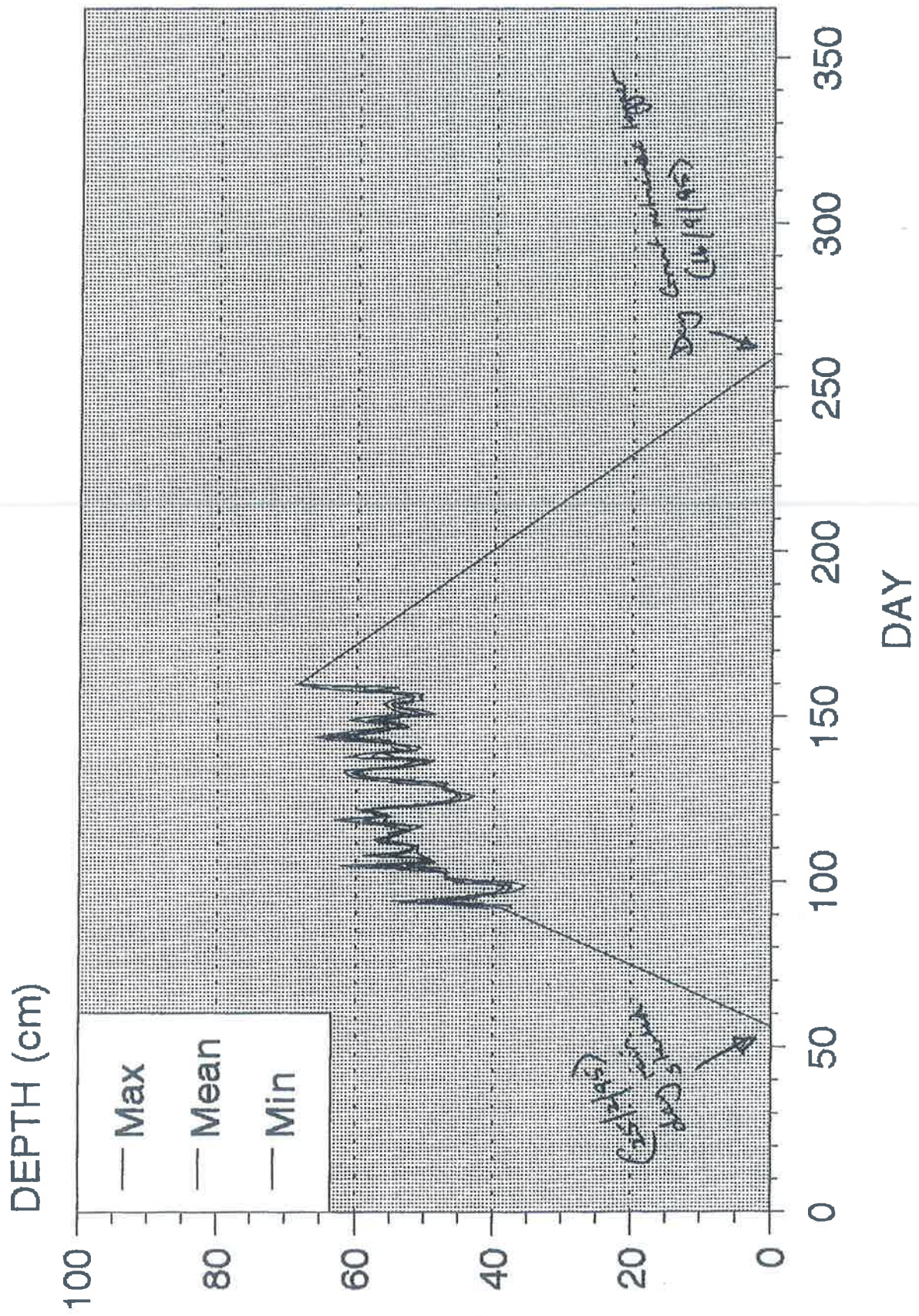
Water

LAKE BALLARD 1995: Δ Depth, salinity, pH, nutrients & rainfall.

14th? (16/9/95) 61

145

C: BARRIS (BARRIS) 6/11/95, ch. 3



LAKE BALLARD 1995: Depth, salinity, pH, nutrients & rainfall.

Fax (10/7/1997) from JL to ACI requesting him to arrange for David Cale [an aquatic invertebrate specialist] to be employed ‘... to sort, etc., twenty samples [sweep or gut and from where and when unspecified] at \$125 per sample. Were these BaSt sweep samples (or gut samples) from Lakes Ballard and/or Marmion in 1995? Was the work arranged and done?

Note that JL’s fax was in response to a fax (attached) of the same date (10/7/1997) from ACI to him, the cover page of which reads ‘For your info as requested’. Attached to this fax is a sticker in JL’s handwriting inter alia calculating the cost of 20 samples at \$125 / sample to be \$2500. This was presumably a record of a phone conversation between JL and ACI before JL’s fax of 10/7/1997. Is ‘\$350 take away’ of any assistance in working out what later transpired?

58.

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

REGULATION DIVISION

WOODVALE

NO (09) 405 5100

FAX N

1 m a b.
 20 syde
 \$125 / syde
 \$350 take away
 = \$125
 \$2500
 28/6/96

Folio 59.



DATE: 10/7/97

TO: JIM LANE

FROM: ALAN CLARKE

NO OF PAGES: 2

(INCLUDING FACE SHEET)

MESSAGE: FOR YOUR INFO. AS REQUESTED.

Fri Pm 1.30 → 6pm.

Yes

A list of the photos (35mm colour positive slides) used by JL for presentations about the 1995 BaSt work on (25th?) Sept 1996 (RAOU WA Group, Perth) and on 07/10/1996 (SHOC, Albany). Include are slides showing 'washing/preening/ drinking stilt (15/3) [3615] and '2 stilt drinking (15/3)' [3589]. There is also a slide of '[ACL] ... in shallow water ... in punt ... [4177]' and 'nests washed away (5.95)' [4148].

Prints (thumbnails) of these and other photos of BaSt drinking, ACL in punt in shallow water, and nests washed away are here.

Solo bly

+ sequence

2 Slides used for Banded Stilt talks to Stan. Hem. Orn. Congress 7/10/96

1 Slides used for Banded Stilt talk (45 mins) to RAOU Perth Monday 25 (?) September 1996

Sequence	Photo ID	Subject	✓	X	(2)
1	486	stills	✓		1
2	"22"	Lake Bellard aerial (15/3/95)	✓		2
3	"09"	" " " - 2 stilt (15/3/95)	✓		3
4	"06"	" " " 1st colony (15/3/95)	✓		4
5	"21"	helicopter at lake (15/3)	X		
6	"25"	Camp Island aerial (15/3)	✓		5
7	"34"	helicopter on Camp Island (15/3)	✓		6
8	"37"	GBP carrying camera case (15/3)	X		
9	"05"	GBP + CDIM approaching island (15/3)	✓		7
10	"07"	" " " + Major Rami next to nesting birds (15/3)	X		
11	12 "18"	nesting stilt (4/95)	✓		10
12	"33"	stilt take off ^{nesting} island (15/3)	✓		8
13	"30"	stilt return to nests (15/3)	✓		9
14	"10"	GBP + CDIM photograph nesting birds (15/3)	X		
15	"09"	washing / preening / drinking stilt (15/3)	X		
16	"17"	2 stilt, ^{back} feathers up, in water (15/3)	✓		11
17	"22"	2 stilt <u>drinking</u> (15/3)	✓		12
18	"25"	2 stilt copulating in water (15/3)	✓		13
19	"26"	" " " " " " " " " " " "	X		
20	"19"	" " " " " " " " " " " "	✓		14
21	"29"	" " " " " " " " " " " "	✓		15
22	"20"	" " " " " " " " " " " "	✓		16
23	"13"	live M + Major Rami mark out quadrats (15/3)	X		
24	"22"	pink taped quadrat of nests + eggs (15/3)	✓		17
25	"31"	eggs (numbered) in nests + peg (15/3)	✓		18
26	4 "04"	Trailer 2 punts + Argo + Grant (4/95) (29/3)	X		
27	1 "36"	composite nest to Corrover Lake (4/95) (31/3)	X		
28	3 "04"	punts with gear entering Corrover Lake (31/3)	X		
29	blanks	punts of gear crossing " " (31/3)			Marks Lumbie photo X
30	3 "05"	loading punt onto trailer (31/3)	X		

[3615]

[3589]

Added 02/4/2014
J-

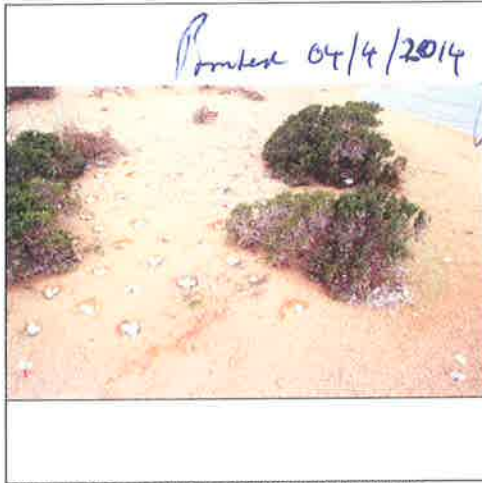
Sequence	① Sequence	Photo ID	Subject
✓ 19	31	3 "08"	Argo putting part out of Crooner Labe - (31/3) ✓
X	32	3 "23"	" " " between Labeas (31/3) X
✓ 20	33	3 "11"	Argo launching pointer into Labe Welland. (31/3)
✓ 21	34	3 "28"	Walking parts of gear into " " (31/3)
X	35	blank	unloaded gear at Camp Island - Mark Lamble photo
X	36	3 "25"	viewing 1st colony from Camp Island (31/3)
X	37	11 "04"	Mark Lamble ^{nesting birds} filming " (4/95)
X	38	11 "32"	Campbell - sound recording (4/95)
X	39	- - -	Mark + Campbell breakfast at fire (4/95)
X	40	12 "04"	Mark sleeping outside tent (4/95)
✓ 22	41	Box 2 "19"	Quadrat NOUT - eggs in nests - (1/4)
X	42	Box 6 "04"	Quadrat 13 14 15 16 - 1 m frame - eggs (4/4) 2nd colony.
X	43	"09"	3 eggs + marlonys (collected) - (8/4)
X	44	"05"	clusters of 3 + 4 eggs (") - (8/4)
✓ 23	45	Box 6 "19"	Quadrat NOUT - eggs in nests - (4/4) - 2 few chicks?
✓ 24	46	Box 6 "20"	" " - eggs + chicks <u>closeup</u> (4/4)
X	47	Box 6 "21"	" " - " " " (4/4)
✓ 25	48	Box 7 "28"	" " - mostly chicks in nests (5/4)
X	49	"04"	Closeup of <u>chicks</u> + eggs in ¹ nest (5.95)
X	50	"09"	" " - 1 chick + 3 eggs " (5.95)
✓ 26	51	"14"	" " - 3 chicks in 1 nest (5.95)
X	52	Blank	Closeup of Adult + 1 chick in nests (Mark Lamble)
X	53	11 "22"	Adult leading chicks towards shore (4/95)
✓ 27	54	4 "24"	" " " " " " (4/95)
✓ 28	55	4 "25"	" " defending chicks at shoreline (4/95)
✓ 29	56	11 "19"	" " pushing another chick away " (4/95)
✓ 30	57	11 "09"	" " leading 2 chicks into water (4/95)
✓ 31	58	9 "01"	2 adults + 7 chicks on water (7/4)
X	59	9 "04"	move " " " " (7/4)
X	60	9 "05"	1 straggling chick behind family on water (7/4)

Sequence (2)	Sequence (1)	Photo ID	Subject
X	61	"01"	creek of large chicks - Lake Barlee (from air)
X	62	"09"	Alen close standing in punt - search for chicks
X	63	"11"	" " speeding in punt - - - -
X	64	"25" [4177]	" " slow in <u>shallow water</u> - - - -
✓ 32	65	"29"	sweeping chicks up with plankton net -
✓ 33	66	"32"	" " - - - - -
✓ 34	67	"33"	" " - - - - -
X	68	"24"	" " into punt " - - -
✓ 35	69	"26"	chicks in holding tub in punt .
X	70	"04"	me holding / banding chicks (in punt) .
X	71	"25"	me banding chicks " "
✓ 36	72	"21"	Alen's hand holding flapped / banded chick .
X	73	"01"	cloud cover (5.95)
X	74	"31" [4148]	rests <u>washed away</u> (5.95)
X	75	" "	"Aginter Island" from air .
X	76	"17"	another resting island from air (30/3)
X	77	"09"	yet " " - - - (30/3)
X	78	"11"	- - - - - (30/3)
X	79	"14"	air photo of tracks on bed of lake .

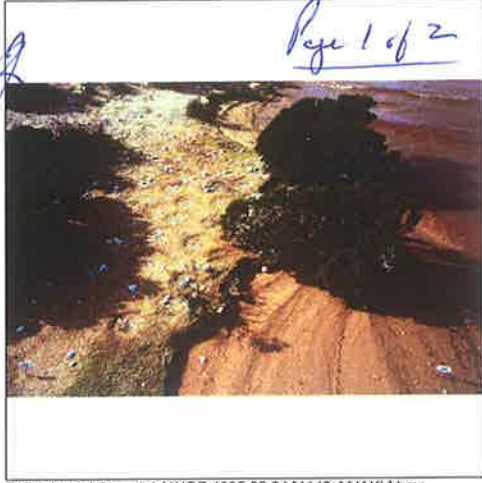
Added 04/4/2014



Ballard quad (lay rate) MNOP 1995.04.07 [4103x] [JAKL].bmp



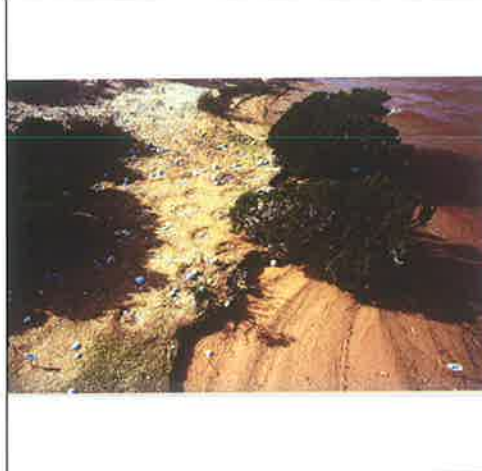
Ballard quad (lay rate) MNOP 1995.04.07 [4103y] [JAKL].bmp



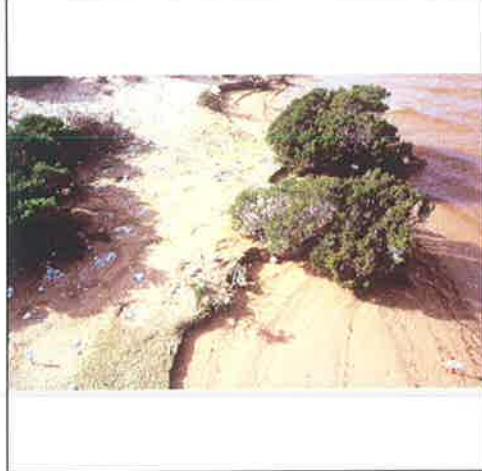
Ballard quad (lay rate) MNOP 1995.05.04 [4148x] [JAKL].bmp



Ballard quad (lay rate) MNOP 1995.05.04 [4148y] [JAKL].bmp



Ballard quad (lay rate) MNOP 1995.05.04 [4149x] [JAKL].bmp



Ballard quad (lay rate) MNOP 1995.05.04 [4149y] [JAKL].bmp



Ballard quad (lay rate) MNOP 1995.05.04 [4150x] [JAKL].bmp



Ballard quad (lay rate) MNOP 1995.05.04 [4150y] [JAKL].bmp



Ballard, 1995.03.15 [3589] adult BaSt on 1st colony [JAKL].bmp



Ballard, 1995.03.15 [3615] (f...s09) adult BaSt on 1st colony [JAKL].bmp



Ballard, 1995.04.30 [4176] (s24) Alan Clarke w punt [JAKL].bmp



Ballard, 1995.04.30 [4177] (s25) Alan Clarke w punt [JAKL].bmp



...9 [4297x] (s28) BaSt colony on 1st Isl. praps near MNOP [GBP].bmp



...9 [4297y] (s28) BaSt colony on 1st Isl. praps near MNOP [GBP].bmp



...9 [4298x] (s29) BaSt colony on 1st Isl. praps near MNOP [GBP].bmp



...9 [4298y] (s29) BaSt colony on 1st Isl. praps near MNOP [GBP].bmp



...9 [4299x] (s30) BaSt colony on 1st Isl. praps near MNOP [GBP].bmp



...9 [4299y] (s30) BaSt colony on 1st Isl. praps near MNOP [GBP].bmp

Two of the ‘overheads’ that JL projected during his presentation (on behalf of JL, CDTM *et al.*) at the ‘Southern Hemisphere Ornithological Conference’ (SHOC) in Albany, WA, on 07/10/1996.

The overhead ‘Lake Ballard – Main Colony, 1995 Breeding Cycle’ contains, inter alia: JL’s calculations / estimates of the number of days taken by each stage in the breeding cycle; an estimate that Lake Ballard’s water level peaked on c.01/3/1995; an estimate of the number of days from ‘lake full’ to ‘lake dry’ (calculated to be approx. 200 days, from approx. 1st March to 16th Sept 1995.

The overhead ‘Current and Potential Conservation Issues’ lists, inter alia, under ‘Non-Breeding Habitats’: ‘salt field construction (+ve) and landscape salinisation (+ve), and under ‘Breeding Habitats’: increased runoff (+ve), siltation (?) (-ve), mining of lake beds (-ve), water use (mining) (-ve) and hypersaline disposal (-ve)’.

LAKE BALLARD - MAIN COLONY

1995 BREEDING CYCLE

<u>STAGE</u>	<u>DURATION (DAYS)</u>	<u>COMMENT</u>
CYCLONE TRAVEL FROM NW COAST TO BALLARD	4	Cyclone weather reached NW coast on 21/2, Ballard on 25/2.
RAIN ON DRY LAKE	4	Rainfall from 25-28/2 was 0.38m. <u>Water level peaked c. 1/3.</u>
500-1000 km MIGRATION, PAIRING, COPULATION, SITE SELECTION, SCRAPE FORMATION, START LAYING	first birds 14-18 last birds 30-34	c. 14 days from start of rain at Ballard to first egg laid (10/3). (c. 18 days from cyclone reaching NW coast).
LAYING	2 - 4	c. 16 days between first and last birds laying.
INCUBATION	22 - 24	Probably begins with 2nd last egg.
HATCHING	1 - 2	99% of hatching was completed within 11 days (3-14/4).
FLEDGING	44	Chicks leave nest within 1-2 days of hatching. First chicks flying on 17/5. All flying by 6/6.
LAKE FULL -> DRY	c. 200	<u>Lake filled c. 1/3; dried c. 16/9.</u>

TIME REQUIRED FOR MIGRATION & BREEDING

FIRST BIRDS	82 - 86 DAYS
99% OF COLONY	93 - 97 DAYS
LAST BIRDS	< 102 DAYS


**CURRENT AND POTENTIAL
CONSERVATION ISSUES**

NON-BREEDING HABITATS



SALT FIELD CONSTRUCTION	+ VE
LANDSCAPE SALINISATION	+ VE
SALINE WATER DRAINAGE	- VE
URBAN GROWTH	- VE
RECREATION	-VE

BREEDING HABITATS



INCREASED RUNOFF	+ VE
SILTATION (?)	- VE
MINING OF LAKE BEDS	- VE
WATER USE (MINING)	- VE
HYPERSALINE DISPOSAL	- VE
RECREATION	- VE



CONSERVATION ISSUES

NON-BREEDING HABITATS

SALTFLATS	+ve
SALINIZATION	+ve
DRAINAGE	-ve
URBANIZATION / INDUSTRIALIZATION	-ve

BREEDING HABITATS

ABORIGINAL LIFESTYLE CHANGE	+ve
INCREASED RUNOFF	+ve
SILTATION ?	-ve
MINING OF LARVAE	+ve
MINING OF LARVAE	-ve
WATER EXTRACTION	-ve
HUMAN WASTE DISPOSAL	-ve

Let's King 1930 not Glomant + Island

Island dimensions

distance from water

Island dimension

critical sizes

Two pages of hand-written notes (02/10/1996) by JL recording ACh's thoughts (conveyed by phone to JL) on 'Conservation Issues / Threats to Banded Stilt in [the] Goldfields'.

Reference is made to: lake bed prospectivity for minerals; Lake Lefroy; nickel; creating islands with waste; causeways as nesting platforms for several waterbird species; Hannan's Lake; Wally Klaus; bunding and pumping; hypersaline water disposal; Lake Carey; natural freshwater recharge; aquatic invertebrates; fresh-saline transition; huge volumes of dewatering; cyanide; milling (crushing); 'King of the West' mine; Yindarlgooda and Roe palaeochannels; 'Lake Barlee – Auriferous Island – prospective' and 'Runoff – increased sedimentation – impact on processes in salt crusts'.

To:

From:

19.....

Your Ref:
Our Ref:
Enquiries:
Phone:

ANDY CHAPMAN - WED 2/10/96

Subject:

His thoughts on Conservation Issues / Threats to Banded Shelt

in Goldfields

these lake beds are

All prospective for minerals -
Mining - is nickel
- creating islands with waste (whether mining)
- concrete - retaining platforms - eg
black vinyl shelt, cement, and rugged floor
Thames lake - but Welly to blame
same then.

- open 100's metres over long
- 50-70 m deep

- water is banded out & they going to
other side of bank.

Use of saline lakes as repositories for hydroelectric
discharge - on all the time - 3 engines
into Lake Carey (retard release is freshwater)
Insert dependent on gradual increase - relatively
Period of wetness is greater. Searching of
inns (mainly open pit) - huge volumes.

Pump water out of lakes - smaller lakes -
relatively fresh - for processing - granite
circuits + milling (conking)

To:

From:

19.....

Your Ref:
Our Ref:
Enquiries:
Phone:

Subject:

pastoral

Project out of "Spring of the West" - partly
significant wetland - wetland use 18 spp
3 breeding - part of Yonder grounds
protected - agreement - relatively good water

Project requirements - several - Roe Pastoral
east of Kafferlin
- pump out moderately saline water - desalt or distill
Many industry in project and low range demand
for water.

Settle water discharge into pipes in junction
more -

Like Bullec - Amfoms island - project

Thrupp - increased sedimentation - impact on
processes in salt water.

'Rough jottings [by JL] made in preparation for talk at the 'Sthn. Hem. Orn. Congress' to be held in Albany on 07/10/1996. Includes reference to: water depths (several important measurements in Lake Ballard are listed), (water level) data logger, salinities, pH ('7.9, 7.8, 8.7'), sweep samples, evaporation rate. This single page has been scanned over two pages due to its length.

at 10m
 pit = 7.9, 7.8, 8.7
 RSR

44 cm on 1
 0 cm on 4/6/9

Sweep samples =
 just samples =

chick size

15 quadrats
 2.5 x 2.5 m

brood size - 2.9, 2.7, 2.6 then 2.4 on water (1-2 days after hatching)

hatching success - 2000 chicks leave = 2 hrs.

fledging success

Individual colour marks

Initially marked
 490 size 8
 than 200

Banded - [10 (chick) + ?
 200 (Total)]

Total = 690 (700?) birds
 500 by fledging?
 Banded
 Marked
 Banded
 Marked

Leg Fledged - [10 (chick) + 170
 195 + 260 + 20 = 475]

Sightings - 1 Lake Arrow (24 km of trail) 24/10/95 -
 1 Redstart 21/1/96 -
 1 Dumpy Tit 7/3/96 -
 3 Pine Woodland siskin 28/2/96 -
 1 Yellow Warbler 19/96 -

Eggs collected - DNA

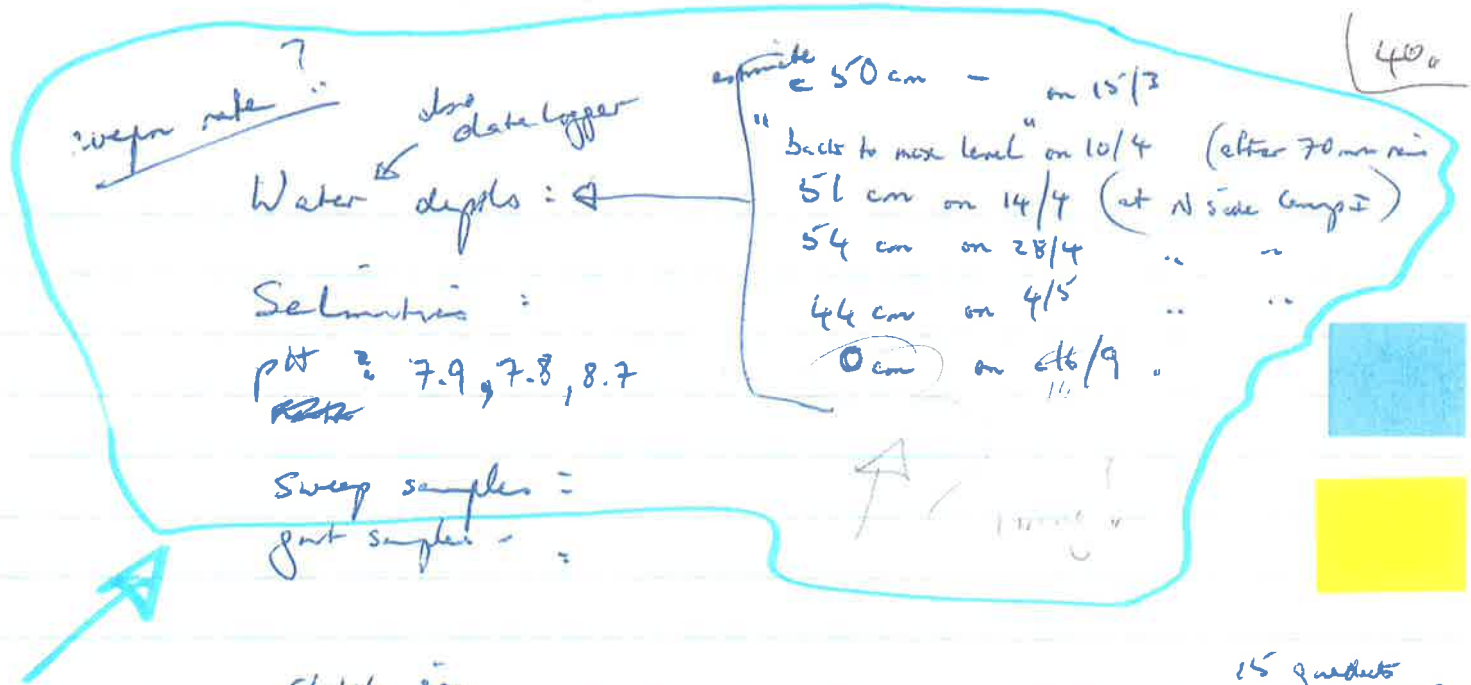
Predators - Little crow (mostly dead, 2 live)
 Wt Eagle (1 live)
 Cat (potential)
 Not gulls.

Waterbird on Common Lake breeding

ABC film



ROUGH JOTTINGS MADE IN PREPARATION FOR TALK
 AT "STHW. IREM. ORN. CONGRESS", ALBANY 7/10/96



chick size
 brood size - 2.9, 2.7, 2.6 then 2.4 on water (1-2 days after hatching)
 hatching success - 2070 chicks hatched = 2 hrs.
 fledging success

Individual colour marks

Individually marked
 450 right wing
 bands
 than 200

Banded - [10 (Chick) + ?] Total = 690 (700?)
 200 (Total)

Leg Flipped - [10 (Chick) + 170] 500 leg flipped?
 195 + 260 + 20 = 475

- Sightings -
- 1 Lake Heron (24 km N of head) 24/10/95 -
 - 1 Redstart 21/1/96 -
 - 1 Dumpy Swallow 7/3/96 -
 - 3 Parus Woodland subspecies 28/2/96 -
 - 1 Yellow Warbler 1/9/96 -

Eggs collected - DNA

Predations - Little crow (mostly dead, 2 live)
 Wt Eagle (1 live)
 Cat (potential)
 Not gulls.

Waterfowl on Crosser Lake breeding.

Abstract (copy faxed by JL to GBP on 05/8/1996) of paper to be presented by JL on behalf of JL, CDTM & GBP, at SHOC, Albany WA, on 07/10/1996.

It includes reference to: 'recently-flooded saline lakes' and 'a super-abundance of brine shrimps *Parartemia*'. A copy of the SHOC program is also included here.

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
BUSSELTON DISTRICT
FAX NO: (097) 521 432

25 (b.)

TO: GRANT P. URGENT: YES / NO

AT: LRC

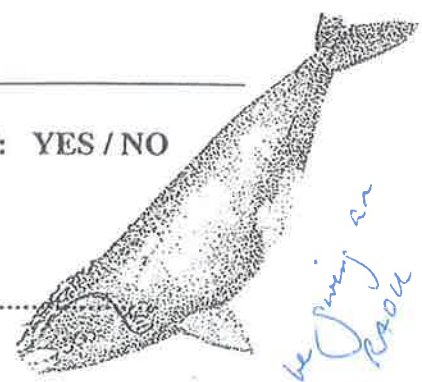
..... Fax No.

FROM: JIM L.

DATE: 5/8/96

Your Ref:

Local Ref:



Handwritten notes:
Dink! g
most of the winter
in Sept.
no sign of them
in Sept.

Copy of Abstract for your info.
Conference is in Albany in October.
Fees (\$350 registration) are enormous so can't attend

No. of pages inc. this page: (2) *attendance by you or Glen C.*

Please call us on (097) 521 677 if this message was incomplete or illegible

PLEASE INSERT FINAL ABSTRACT BELOW

**BANDED STILT BREEDING AT LAKE BALLARD,
WESTERN AUSTRALIA**

J.A.K. Lane*, G.B. Pearson and C.D.T. Minton

Banded Stilts *Cladorhynchus leucocephalus* are endemic to Australia and unique among the 214 species of wading bird in the world in that they nest colonially, have white downy chicks and raise their young in creches. Breeding is confined to recently flooded saline lakes of the arid interior. Here the birds nest in the tens of thousands and feed on a super-abundance of brine shrimps *Parartemia*. Because of the considerable difficulty of finding and gaining access to nesting islets, Banded Stilt breeding has been infrequently observed and little studied. In February 1995, Cyclone Bobby dumped 380 mm of rain to the north of Kalgoorlie in four days of continuous downpour. An aerial survey on 12 March revealed a colony of Banded Stilt on an islet in Lake Ballard (60 000 ha). During ensuing months this breeding event was followed by CALM scientific and management staff, Clive Minton of the Australasian Wader Study Group and a film crew from the ABC TV Natural History Unit. Preliminary results of this work will be presented.

SPOKEN OR POSTER PAPER
FINAL ABSTRACT

(This is only required if not already submitted to the Organising Committee)

Southern Hemisphere Ornithological Congress
Albany, Western Australia
October 5-9 1996

- 1. We will be presenting a: spoken paper poster paper
- 2. Complete name and mailing address of the author who will be presenting.

Name: J.A.K. LANE
 Organisation: DEPT CONSERVATION & LAND MANAGEMENT
 Postal Address: 14 QUEEN STREET
 KASSLETON WA 6280
 Tel: 097 521 677 Fax: 097 521 433
 Email:

3. GUIDELINES FOR LAYOUT OF ABSTRACT

The title, authorship and all of the text must fit inside the lines of the rectangle shown on this form. Place an asterisk after the name of the author presenting the paper.

The text should be a single paragraph which outlines the material that will be presented at the Congress. Your abstract should not contain tables, figures, literature references or acknowledgements.

The type font must not be smaller than 10 point.

4. METHOD OF SUBMITTING AN ABSTRACT

The abstract must either be typed or pasted onto this form. If submitting an additional copy by electronic means, please use Word for Mac or Word for Windows format.

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PLEASE INSERT FINAL ABSTRACT BELOW

BANDED STILT BREEDING AT LAKE BALLARD,
WESTERN AUSTRALIA

J.A.K. Lane*, G.B. Pearson and C.D.T. Minton

Banded Stilts *Cladorhynchus leucocephalus* are endemic to Australia and unique among the 214 species of wading bird in the world in that they nest colonially, have white downy chicks and raise their young in creches. Breeding is confined to recently flooded saline lakes of the arid interior. Here the birds nest in the tens of thousands and feed on a super-abundance of brine srimps *Parartemia*. Because of the considerable difficulty of finding and gaining access to nesting islets, Banded Stilt breeding has been infrequently observed and little studied. In February 1995, Cyclone Bobby dumped 380 mm of rain to the north of Kalgoorlie in four days of continuous downpour. An aerial survey on 12 March revealed a colony of Banded Stilt on an islet in Lake Ballard (60 000 ha). During ensuing months this breeding event was followed by CALM scientific and management staff, Clive Minton of the Australasian Wader Study Group and a film crew from the ABC TV Natural History Unit. Preliminary results of this work will be presented.

Wader migration strategies in the Australasian- Asian Pacific flyway

C Minton (Wader Studies Group, Australia)

A comprehensive analysis of all recoveries of waders banded in the Australian-East Asian Flyway, together with sightings of colour leg-flagged birds, has been undertaken. The information will be used to outline migration routes and key stopover locations for different species. Weight data collected on migrants prior to departure will also be used to delineate the different migration strategies employed by various species in the flyway. Such data are the foundation for conservation initiatives now being promulgated, including the Australasian-East Asian Flyway Shorebird Reserve Network.

Banded Stilt breeding at Lake Ballard, Western Australia

J Lane (WA Department of Conservation and Land Management, Australia), **G Pearson** (WA Department of Conservation and Land Management, Australia) and **C Minton** (Wader Studies Group, Australia)

Banded Stilts *Cladorhynchus leucocephalus* are endemic to Australia, and unique among the 214 species of wading bird in the world in that they nest colonially, have white downy chicks and raise their young in creches. Breeding is confined to recently-flooded saline lakes of the arid interior. Here, the birds nest in the tens of thousands and feed on a super-abundance of brine shrimps *Parartemia*. Because of the considerable difficulty of finding and gaining access to nesting islets, Banded Stilt breeding has been infrequently observed and little studied. In February 1995, Cyclone Bobby dumped 380mm of rain to the north of Kalgoorlie in four days of continuous downpour. An aerial survey on 12 March revealed a colony of Banded Stilt on an islet in Lake Ballard (60,000ha). During ensuing months, this breeding event was followed by CALM scientific and management staff, Clive Minton of the Australasian Wader Study Group and a film crew from the ABC TV Natural History Unit. Preliminary results of this work will be presented.

Conservation of endemic New Zealand waders

R Pierce (Department of Conservation, New Zealand)

New Zealand has nine species of endemic waders, three of which also exhibit sub-specific variation. Of the nine endemic species, eight are considered threatened. The rarest taxa are the Chatham Island Oystercatcher (*Haematopus chathamensis*), Shore Plover *Thinornis novaeseelandiae*, Black Stilt (*Himantopus novaeseelandiae*), and the southern sub-species of New Zealand Dotterel (*Charadrius obscurus*), each of which numbers fewer than 150 individuals. Management programmes for all species have focused on combinations of habitat restoration, predator control, public awareness, captive breeding and release, translocations and pest contingency planning. Habitat restoration has focused primarily on mainland sites, particularly riverbeds and other wetlands which have become infested with weeds. This is best illustrated by Project River Recovery in the MacKenzie Basin where clearance of willows from riverbeds has resulted in recolonisation and breeding by four endemic species of wader, and other riverbed birds. Some predator control has been undertaken, with varying success, for Black Stilt nest protection, and elsewhere for southern and northern races of the New Zealand Dotterel and Variable Oystercatcher. Public awareness programmes have been successful in increasing the productivity of shorebirds generally, particularly on North Island beaches where many breeding grounds are fenced off from an increasingly beach-going public. Captive breeding programmes for the Black Stilt have resulted recently in the release of up to 30 juveniles (or sub-adults) into the wild each year, with some of these birds being recruited into the Black Stilt population. Shore Plovers have been raised in captivity in recent years, and two experimental releases on to mammal-free islands off the New Zealand mainland have taken place, the first failing because of predation by moreporks (*Ninox novaeseelandiae*) and dispersal of survivors to the mainland. Further releases of captive-reared

**Notice of Seminar to be held at CALM Wildlife Research Centre, Woodvale,
on 17/05/1996 with JL presenting 'Banded Stilt Breeding in the Goldfields'.
Abstract refers to 'recently-flooded saline lakes' and 'a super-abundance of
brine shrimps *Parartemia*'.**

204.

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
Science and Information Division



SEMINAR

17 May 1996

presented by Jim Lane

BANDED STILT BREEDING IN THE GOLDFIELDS

Banded Stilts *Cladorhynchus leucocephalus* are endemic to Australia and unique among the 214 species of wading bird in the world in that they nest colonially, have white downy chicks and raise their young in creches. Breeding is confined to recently flooded saline lakes of the arid interior. Here the birds nest in the tens of thousands and feed on a super-abundance of brine shrimps *Parartemia*. Because of the considerable difficulty of finding and gaining access to nesting islets, Banded Stilt breeding has been infrequently observed and little studied.

In February 1995, Cyclone Bobby dumped 380 mm of rain to the north of Kalgoorlie in four days of continuous downpour. An aerial survey on 12 March revealed a colony of Banded Stilt on an islet in the 60 000 ha Lake Ballard. During ensuing months this breeding event was followed by CALM scientific and management staff, Clive Minton of the Australasian Wader Study Group and a film crew from the ABC TV Natural History Unit. Preliminary results of this work will be presented.

Venue:

Wildlife Research Centre
Ocean Reef Rd (near Joondalup Drive)
Woodvale

Time: 3:00 pm

Contact for Seminar: C Farrell 405 5146

Hardcopy (16/05/1996) of document ‘Banded Stilt *Cladorhynchus leucocephalus* Seminar’ ‘... compiled [by JL] 14-16 May 1996 in preparation for seminar at Woodvale [CALM’s Wildlife Research Centre] on Fri 17 May [1996]. Words and sentences relating to water analysis, sweep samples, water level data logger, water depths (incl. Lake Barlee), incubating BaSt dunking belly feathers before returning to nest, BaSt drinking, lake filling, BaSt diet, salinity, nutrients, phosphorous, nitrogen, water (and air) temperatures, BaSt feeding areas, BaSt ‘drank’, rain, brine shrimp, water level stake / stick, pH; chicks walking, wading, running; ‘artemia’, ‘chicks feeding in very shallow water on minute items too small to be brine shrimp’, ‘water too shallow for outboard’, ‘[Lake] Marmion – installed staff gauge’, ostracods, *Parartemia*, parts of lakes dry, etc., have been highlighted (in blue, by JL on 02/4/2014). Note that this document is not a primary source.

This printout appears to be of "STILTSEM" (Date Modified 16/05/1996 5:12 PM) 10/01/2014

BANDED STILT CLADORHYNCHUS LEUCOCEPHALUS SEMINAR

This material compiled 14-16 May 1996 in preparation for seminar at Woodvale on Fri 17 May.

- Info in this document has been drawn from my BaSt files (Vol 1 gone thru carefully, Vol 2 less so, stopping just before reaching transcript of Clive comments while viewing uncut stilt footage from Ballard), also from the 2 Wingspan articles (Vol 5 Nos. 2&3), also my work diary.
- Still need to: redo Vol 2, go thru my notebooks, get data that Grant, Alan and Andy have yet to give me, get water analysis results, do sweep and gut contents, do photos of nest quadrats, data from logger (I think Grant has sent it to me).

The Banded Stilt is : *Cladorhynchus leucocephalus* Slide of stilt description?
 only found in Australia, monospecific genus, member of .. family
 distribution, numbers

wt 220-260 gm (Hogarth)

first discovered in 18.. by .. at ..
 breeding a mystery until 1930 when recorded at.. by .. colony size ..
 since then, breeding recorded at .. (sites, distribution) Only about 20 nesting events ever recorded (3 in SA and rest in WA). Most nesting attempts only found when chicks mobile or breeding over (deserted colonies).
 breeding actually witnessed on few occasions, due to difficulty of finding and gaining access to colonies
 Chicks on road at Menzies. (1400 walked thru town?, 500 killed on road?)

Grant and I have taken an interest in locating breeding sites since 19.. when he and Phil Fuller found .. at Lake Barlee.

Since then we have:

Barlee in 19.. with Roger Jaensch and found ..

Primary interest is in identifying significant breeding sites and any threats, conservation needs

In Feb 95, Tropical Cyclone Bobby dumped 385 mm of rain to north of Kalgoorlie in 4 days (25-28th) of continuous rain.

Stilts left coastal sites e.g. Creery lagoon.

We planned an air survey of .. for

Clive Minton contacted us. He was passing thru Kalgoorlie on .. and interested in flying with us sharing costs.

Jeremy Hogarth of ABCTV Natural history (who Grant had met on Broome wader expedition) also contacted us to see what we were doing 'cause they wanted to film Banded Stilts nesting (waiting for .. years since meeting Clive?).

Grant flew to Kal on .. to join Clive for flight.

1004 stayed overnight
 0950 hr arrived Marmion
 1014 hr left Marmion
 1018 hr arrived Ballard (East)
 102 hr leave Ballard
 1123 hr arrive Barlee

Sun 12 March Air survey

Grant & Clive flew Barlee, Ballard and Marmion Lakes (previous nesting locations) 150-250 km N of Kal on Sunday 12 March, 16 days after 4 days rain started. 4.5 hrs searching.

Marmion: no birds.

Barlee: 20 000, all seemingly paired but no sign of colony. Had the least water of the three lakes. 1745 "end survey" (wet?)

Ballard: All birds on water were paired. 10 000 birds, half (5000) at colony (1st) of around 2000 nests. At core of colony incubation appeared to have begun.

Not equipped to gain access to colony.

Luck. Found a Jet Ranger helicopter in Kalgoorlie with a spare day. Agreed to share heli cost with Clive 50:50. (Pilot + 3 or 4 + hide; \$695/hr; 1hr each way). Clive rang me to convince of value. On Tues 14th he faxed me a draft research program.

Wed 15 March 1995, Clive Minton, Marij Reni, Grant, me. Helicopter to Lake Ballard

"Photo 6 at the north end of Marmion" between 1004 hr + 1014 hr.
 "Photo 8 flooded station" between 1014 + 1018 hr.
 "Photo 9 East end of Ballard" between 1018 + (say) 1025 hr.

I flew to Kalgoorlie from Perth 0615 hrs on Wed 15 March for **helicopter trip** (returned to Perth same evening, (with Grant?)).

Grant, Clive, Marj Reni (VWSG) (staying at Prospector Caravan Park) and I flew to Ballard colony on Wed 15 March 1995.

Perfect island for helicopter adjacent, even shade. We landed 600m away from nesting area without disturbing the birds.

Circled island first for photographs of extent of nest area (see folios 14-16 for map (from my air photos) of nesting area on this day).

Landed, walked, waded to nest island. Found we could sit 10-20m from nesting birds.

Observed plumages, nesting behaviour, eggs, staked out and phot'd (to see how many nests, eggs and eggs/nest) some quadrats to, marked eggs in c250 nests for determination of clutch size, nesting density, hatching success etc .. (We marked every egg in every nest in an area (still laying) outside the quadrats with the number of eggs in that nest), photographed birds.

Colony now 4500 nests (from 2000 in 3 days).

Copulation attempted everywhere, 45 seconds each, up to 20 visible at one time.

Nests contained 1-5 (mostly ..) eggs, colony still growing. Assuming laying rate of 1 per day, the first eggs (i.e. of the nests containing 5 eggs, and also assuming they were all laid by one bird) were laid around 8 March, 12 days after 4 days rain started and only 8 days after it finished!

3 eggs one bird -> 10/3 = 14 days after rain

Frenzied activity - pairing, fighting, copulating.

One third of birds did not have complete plumage. 10% had no band at all. Yet doing everything including copulating (both males and females) and incubating.

Back plumes.

Predators?

Incubating adults dunking belly feathers in water and having drink before returning to nest (hot day).

Spent 8 or 9 hrs (check notebooks) at island then flew back to Kal.

I flew back to Perth at 1940 hrs (with Grant?).

This was the earliest stage at which a nesting colony had been visited by anyone (not true for early scrapes).

Planning

Discussion with Clive and Jeremy. Opportunity for the first time to follow breeding event from go to whoa.

Information on how soon after lake fills does nesting start, clutch size and laying rate, incubation period, how long for chicks to fledge, diet, salinity, role sharing, nesting behaviour, hatching success, fledging success, predators, dispersal. Also band and leg flag for first time - dispersal, movements, survival. I had particular interest in seeing what threats might be, any conservation needs.

ABCTV would join us. We would make logistically possible (Argo, boats, radios, camp, etc) and ABC would pay for air surveys including first and helicopter flight.

Did literature searches with Romeny Lynch's help re colonial nesting studies, DNA, Banded Stilt.

Planned to return on ground on .. (me booked to fly to Kal on evening of 22 March and do air survey 23/3) but delayed 1 week (?) due to ill camera man (bitten in Qld, hospitalised) and need to find replacement.

Sun 26 March - Fri 7 April. Me, Grant (most of time), ABC TV, on Lake Ballard, at Camp Island

Grant and I drove to Kalgoorlie with trailer, 2 punts (10', 12'), outboards, Argo, Argo trailer, etc (SLIDE) on (Sun 26 March), meeting ABCTV Nat Hist crew (Mark Lamble and Campbell ..) at Kal airport around 7.15 pm).

Wed 28/3 - 7

Next day, Grant and Mark (?) did air survey of Ballard and Barlee. Found fewer birds and no nesting on Barlee, but now 3-4 (how many seen on flight, only 3 and not including colony 3.5 km west of Camp Island?) nesting colonies on Ballard.

After lunch, Grant, I (our vehicle) and ABC team (with hired Toyota personnel carrier) drove to Jeedamya Station (leaseholder/manager is John Finlayson) and then to Crossover Lake. Ferried some gear across Crossover Lake by punt, then camped on N side for the night. Next morning (29/3), ferried rest of gear across lake, then to shore of Ballard (by Argo + Argo trailer) then ferried gear by punts (1 8hp outboard, 1 electric) out to Camp Island. Established camp there (water, fuel, generator, tents, tarps, fridge, 25 watt portable HF radio with selcall, hand radios. Water .. deep. Camped there for .. days.

Is the following air survey data or ground data? 

Now 1st colony grown to 20 000 nests (10 per sq metre).

Second colony of 15 000 found 3.5 km west.

Also two other, smaller colonies (seen by Mark and Grant further west during air survey) on Ballard.

Observed ... numbers in and out of colony, colony size, new quadrats to determine laying rate - photographed these daily. Photographed quadrats established on previous visit daily - most interested in when hatching would occur (incubation period) (from incomplete catches of 15/3 plus knowledge of final clutch size and laying rate and date hatched).. Stopped photographing these when first chicks appeared because of concern about mortality (Mark Lambell had observed aggressive behaviour of adults to chicks on nest. Established 4? new quadrats in area where laying still occurring (nests contained 1 preferably or two eggs) using 20mm PVC pipe and elbows, and phot'd each day to determine laying rate.

Established automatic water level recorder, took water samples for salinity and nutrient (P & N?) analysis, sweep samples (50um or 110um nets?) near camp island for invertebrates. Water and air temps taken. ult feeding areas to collect adults and sweeps for diet analysis.

Hatching began on 3 April (peeping on 2/4?), .. approx .. days after....

Mark and Campbell .. boated off to west and found a second colony of .. pairs, .. km distant. Filmed frenetic behaviour. Reported new nests being formed and eggs layed, so next day I went there and established ten .. quadrats to determine laying rate and subsequently size of colony, hatching success and hopefully incubation period

Predators observed were ..

Banding, colour marking and flagging approved by ANCA on 23/3).

Had bands (initially 490 (issued 23/3), size 8, incoloy) on this trip. Used this trip? by Clive?.

I tried catching adults on nest to individually colour mark (20 bands of each colour). Too disturbing.

Then tried individual recognition by plumage. Too time consuming.

I collected 30? eggs of .. clutches (SLIDES or prints?) for DNA testing to see if all layed by same female.

Show also SLIDES of clutches in nest?

Recorded waterfowl breeding at Crossover Lake for comparison.

Ron Johnstone, Phil Stone, Nick Kolichis's air survey on Fri 7 April (and 1 day ground visit on Sat 8th).

They flew (air survey) Barlee (central arm & northern portion), Goongarrie, Marmion, Ballard and Raeside (central) on 7 April (flew over me at 1st colony) and found:

- Marmion: 500-1000 stilt (no colony seen),
- Ballard: 1st colony 3-5000 pairs, 2nd colony 2-3000 pairs, at 29 23'S 120 51'E colony of 500-1000 pairs, western end possibly 500-1000 pair colony
- Barlee: 1000 pair colony (my Guitar I.)

On 8/4 they paddled kayaks out to both colonies (met our team). Phil Stone took "viewCAM". Took photos. Rain, cold squalls. On 2nd colony they did/saw:

- collected 10-12 incubating adults ranging from 0-100% chest band.
- collected 4 chicks
- took stomach samples
- collected small series of eggs
- Saw creches of 50-100 birds
- hoard of crows came off the island

- Wedge-t Eagle

Ron J. also said "John Darnell, Port Hedland 50-60 000 birds, 80% inactive"

Grant returned to Perth on .. for a few days (left vehicle in Kal?) to do Peel-Harvey on 5/4 and for private reasons, but did his back in (so Alan Clarke and Raelene did P-H on 6/4 instead). I left Ballard on Fri 7 April, Cam gave me a lift in ABC vehicle back to Kal for the night. Grant returned (flew) to Kal on Fri 7 April and had late dinner (valium) with me and Cam in Kal. Next morning I flew to Perth and Grant and Cam returned to Ballard, meeting Clive at Jeedamya (he had driven down from Broome) and taking him out too.

I took still eggs to John Weatherall at ^{Curtin} Murdoch Uni on Sat 8 for DNA analysis (what requested?)

2014/4/2014

Sat 8 April Clive joins, Grant rejoins, ABC TV team on Lake Ballard at Camp Island (I left previous day). Grant and ABC leave .. April, Clive leaves 15 April

Grant had returned to Perth on .. for a few days. He returned (flew) to Kal on Fri 7 April and met (late dinner) me and Cam in Kal. Next morning Grant and Cam returned to Ballard (I flew to Perth), meeting Clive at Jeedamya and taking him out too.

Clive and Grant did the following.

- collected with Grant 3 males and 1 female with chicks

Much rain. Clive's vehicle bogged at Crossover Lake.

Grant and ABC left on .. Gear left in ABC tent and under green tarp on Camp I.

Clive stayed on his own for three days until Sat 15/4, when he left.

Clive did the following.

1st colony

- photo'd the 15 quadrats (on 15/4?)
- counted addled eggs, dead chick, active nests
- guessed 20 000 nests

2nd colony

- measured approx as $80 \times (20 - 5) = av15 = 1200sq\ m = 12-15000\ nests$

General

- 9-10 AM (12/4), incubation changeovers observed. .. PM (9/4) birds left nest, drank etc, returned to unoccupied (except eggs) nests to resume incubation. Unclear how frequently changeover occurs and in what proportion of nests.
- 1 parent with chicks when leave island
- rain added 13cm to Ballard. Water depth 51cm at 4pm on 14/4, four days after rain (at stake on N side of Camp I.)
- didn't band in colony.
- caught broods going to water for measurement purposes. Footprints trap chicks, fill them in.
- by boat & plankton net, Clive (alone) banded, flagged, weighed, measured 10 chicks (4 families) in 2hrs, don't catch all at once.
- expects high survival
- on some mornings Clive saw up to 2000 chicks leaving 1st breeding island in just a couple of hours.
- recorded brood sizes
- families were closely associated on water, but no true creching at this stage at least.
- lack of predation. Compare with Lake Torrens in 1989 where Silver Gulls totally destroyed last part of colony and took many eggs and some chicks throughout the breeding event. No gulls yet (I saw 1 later, not at colony).
- Little Crows mainly took dead chicks, often failed to take live chicks, only succeeded twice.
- Wt Eagle snatched chick from group of adults and chicks crossing island.
- 70mm of rain fell on 10 April, topping up the lake almost back to its maximum level..
- parents don't do distraction displays, unlike other waders.



Incubation period:

- hatching commenced 3 April, 22 days after first air survey of 12 March, therefore incubation at least 23 days (counting 12/3 and 3/4). Note that I said hatching started 3/4, but I actually heard cheeping in 2/4 (check), which gives incubation period of **at least 22 days**.
- 2nd method of calculation [from general area where we marked (on 15/3) eggs of incomplete (1-2 egg) clutches, and Mark Lamble's advice that most here hatched 6, 7, 8th April, i.e. 23 days after 15/3, assuming they became 3-4 egg clutches] gives 21-23 days (counting 12/3 and 7/4) (23-2+1= incubation period of **22 +/- 1 day**)
- 3rd method [Clive's visit on 9/4 to area of eggs marked on 15/3 and observation of a nest with 4 eggs, one of which was marked "1" (i.e. only one egg in this nest on 15/3), with 3 of these chipping on 9/4] (25-3+1=23 days) (includes day of hatching). Also 2 nests with marked eggs, some chipping and 1 or 2 chicks in nest. One is consistent with 23 day max incubation period, the other calculates to **23 day** period.
- Most other eggs in marked eggs area visited on 9/4 had hatched (some added) therefore the above three calculations probably at upper end of range of incubation period, **therefore average incubation period probably 21-23 days**.
- Note that all three methods assume incubation commences after laying of last egg of clutch. It probably commences after 2nd last egg so add 1 day to each of above, gives incubation period of **22-24 days**.

Hatching success

Clive photo'd and counted eggs etc in the 15 quadrats on 14 April at completion of nesting.

Weights

Egg weights: within week of hatching (2 chipping): 28-45gm (average c **37.5gm**). Note that Clive wrote in Wingspan that "clutch of eggs weighs almost as much as female itself". **CHECK CLUTCH SIZES AND WEIGHTS.**

Chicks caught as leaving colony (before reaching water) on 12 April: 22-31gm (average **27.6gm**, n=11)

Chicks banded & flagged c1km west of colony: 23-31gm (average **27.4gm**; n=10)

Chicks (1-2 days after leaving nest) collected 1-2km W of colony on 11/4: 23-28.5gm (average **25.8gm**; n=14; c1/8 of adults).

Adults collected with 1-2 day old broods: 4 male 203, 209, 210, 241gm; 1 fem 197gm. (average **212gm**)

All had active large double brood patches.

<u>Brood sizes</u>	as leaving the colony			on water 1-3km from colony (1-2 days after leaving)	
	9/4	12/4	14/4	11/4	
Average	2.9	2.7	2.6	2.4	
Mode	3	3	3	2	
broods (n)	60	131	153	81	->425

Crossover lake records.

Grant went to PNG from Sun 23 April to .. so unavailable for next Ballard trip.

26 April - 4 May ?, Alan Clarke, Rob Thomas (1 night) and me, joined by Andy Chapman, Lake Ballard, at Camp Island.

Alan and I drove up from Perth in 4Runner with punt and outboard (SLIDE) on Wed 26 April. Now have 2 petrol outboards(.. and 8hp) plus electric.

I did air survey of Barlee and Ballard on Th 27 April AM.

- Barlee: Found breeding island (empty), I creche of 50 large chicks + 10 adults. W-t Eagle swooping. Also c3000 adults".
- Ballard: Found no stilt on 1st island, but still stilt sitting on 2nd. No other breeding sites found. Many creches (to 50) to west and north of 2nd island. Chicks in 1000s, not 10 000s (underestimate?).

Mon 01 May 1998
22/12/13
6.

27 April PM, Alan, Rob and I drove (2 vehicles to Jeedamya and then out to Camp Island in the dark on compass bearing).

Next day (Fri 28/4), 1st breeding island already deserted (SLIDES). Counted chicks coming off 2nd island. Rain.

Rob left for Kal that afternoon (Fri), wet track out. Pissed down overnight?

Andy Chapman joined us for 3 days (picked him up at Crossover Lake) on PM of ... (Sun or Mon).

Andy, Alan and I took water samples, measurements, Collected parents and chicks for diet, sexing. Caught (SLIDES), banded .. and leg flagged (SLIDES and EXHIBIT) on tibia (above "knee"). 500 flags made by VWSG (Mike Barter, need to thank) Why yellow?

Flagged 170 chicks. .. by boat (SLIDES), ranging .. km west of 2nd nesting island. We shot, collected, swept.

Brine shrimp abundant.

Water depth, quality:

28/4: water 0.54m deep at stake next to Camp island (0.89m from top of stake down to water surface), pH 7.9, Temp 19.0 (8.30hrs. am?). (V1, folio 106)

2/5: depths at sites of collection of adults and chicks, 0.47, 0.48, 0.49, 0.33, 0.31m. (V1, folios 108-9).

4/5: 0.44m deep at stake (0.97 down from top of stake), pH 7.8, temp 12.6 (time?)

Measured 1st nesting area on 4 May (when 2nd?) and used triangular tessilation method to compare later.

Alan and I left on 4 May, driving 4Runner back to Perth (Northam).

Crossover Lake records (see Vol 1, folios 107, 109).

8hp outboard taken to Kal for servicing, electric outboard left at the Lake.

9 - 17 May, ABC TV team at Ballard on own, Camp Island then drove to West end of Ballard air survey?

Detailed report at V1 folios 129-33.

Did air survey with Andy Chapman.

All birds had left 2nd island. All creching at W end of Lake.

Mark and Cam left Kal Tues night (9/5) and drove to Crossover Lake. 1-3mm rain o'night.

Wed 10/5 to Camp I. then Mark boated c 15 km W till too shallow. V. strong NW wind flattened tent on Camp I. Rained o'night < 5mm.

11/5 looked for tracks to W on mainland.

12/5 filmed Camp I. and 1st deserted colony. 2-3000 adult stilt landed in water near 1st island, then moved up close to it. Attempted copulation on water. Very vocal. Very flighty. They filmed it. The birds left when Wt eagle landed on breeding island.. "over 2.5-3hrs (meaning?).

13-14/5 filmed Camp I. and 2nd deserted colony.

15/5 moved from Camp I. to New Camp.

16/5 filmed chicks on lake.

17/5 filmed chicks, returned to Crossover lake camp.

18/5 returned to Kalgoorlie.

They then drove to west end of lake along N side trcks/fencelines. Camped there. (2 days?). Big sand dune, visibility for c2km. Takes 2hrs towing trailer to drive from Crossover Lake to new camp when have done it once. 60km/hr in good stretch. 3 fences to cross, then camp 500m from lake (good map at V1, folio 129).

Many adults flying back and forth past Camp I while camped there.

Found "hundreds and perhaps thousands of chicks" 30? (not 70) km W of Camp Island. Compare this with statement in Wingspan that Mark reported tens of thousands of well-grown chicks on the western end of Ballard. CHECK.

Fledging on 17 May Mark and Cam saw chicks flying 30-50 cm above water for 10-15 meters. These were the oldest chicks seen. Saw chicks flying only 3 times near New Camp. So if these were the first chicks to hatch, i.e. hatched at 1st island on 3rd April, they fledged at 44 days (6 weeks 2days).

No strict creches, loose groups of 3-20, all different ages, adults interspersed and came and went. Adults acted as sentry/alarm birds and lead chicks away from threat. Didn't appear attached to particular chicks. Birds very very flighty to people (1 km or more away). Used Argo as film platform. Half a km from new camp he (Mark) had birds walking past very close.

One person can round them (chicks) up on hard ground.

Conditions changed day to day (wind).

The birds marched E during day and W at night. Chicks are wading, not swimming.

Very few "artemia" in water near new camp, but v. thick around breeding island (estimated 4x as many as previous visit).

Wingspan article says chicks feeding in very shallow water on minute items too small to be brine shrimp, and adults periodically left chicks to fly to deeper water, presumably to feed on brine shrimps.

Bogged the Argo many times in soft spots in mud. It did not fare well..

No predators except uid raptor.

- Mark caught one banded chick on 10/5 at 2pm, 3km NW of Camp I. (among 7 chicks and 3 adults). Didn't get number.

Filmed chicks from Argo. Birds came to accept it and was a great filming platform (said it would also be good catching platform).. Cat came down sand dune and birds ran away.

7-14? June 1995. Grant, Alan and Andy Chapman at Ballard, then Marmion Lake

Air survey by Andy Chapman and Ian Kealley in Cessna 210 on Tuesday 6 June of Ballard and Marmion with objectives of .. (V1, folio 123). Not paid for by ABC (agreed). Strong NW wind. (full report at V1 folios 139-40). (Also see V2, folio yy for another full report COMPARE!!)

- Ballard 22 000 stilt. No flightless chicks left. Not one! Therefore all fledged Check against date at which last chicks came off 2nd island. No new nesting activity. GyTI in thousands, Shel in hundreds.
- Marmion: c1500 adults and c600 chicks (about same age as Ballard at beginning of May, i.e. some not long out of nest) in lee of one island. Also another c700 adults Water too shallow for outboard. Din not find nest site but thought could find on ground. GyTI & Shel.. Note that Wingspan article says colony on Marmion was "5000 pairs, with at least 2000 chicks seen in June" and "nesting success probably lower than Ballard due to regular presence of Wt Eagle and a Peregrine Falcon..

My Diary says "advise Grant of Marmion location" (ticked).

Grant and Alan then drove to Kalgoorlie (see full report of this trip at V1 folios 150-154).

Initially they went to Ballard?

Water depth and quality: depth 775 mm (??), pH 8.7. Samples taken, sweeps done. Nesting area of 1st island precisely measured. Depth datalogger downloaded, logger left in place.

All gear withdrawn from Camp Island and Crossover lake campsite.

Crossover Lake records:

Grant, Alan and Andy moved from Ballard (Camp Island) to Lake Marmion on Sat 10 June access via V. Tonkin's station. Have "magic" campsite.

Marmion

Installed staff gauge. Measured water quality., samples, pH 7.4.

Found 10-15 000 adults and 1000 chicks.

- On 11/6, banded 200 chicks (all that were issued) on left tibia. Flagged 195 chicks on right tibia. Worked from Argo, towing 3m punt. (Note that extra 20 were flagged but flags removed because thought on wrong leg).

Collected 1 family. Chicks weighed 32, 33, 34, 39, 42 gm. All had large yolk sacs. Adult was male, 221 gm.

Salinity 46 ppt on 11/6 (Andy Chapman), pH was 7.9.

Ostracods and Parartemia.

Depth mainly 10-20cm, too shallow for boat, used Argo.

Capture chicks by driving to creches, chase 20-30, catch, take back to boat, release, adults come back.

Oldest chicks have well developed flight and body feathers, will fly within week. Also chicks 2-4 days old..

Andy left at 0700hrs on 12/6 and flew air "survey" of Marmion (and..?) on Mon 12 June to find nesting site and direct Grant that way (also to Grant via radio in PM).

- Banded and flagged chicks. Total flagged = 195+260+20=475.

Collected more families. Detailed measurements taken.

On 13/6 Grant and Alan visited Marmion nest site (SLIDES??).

Water depth up to 52 cm.

Detailed observations made at colony.

Measurements. Size of colony. Peregrine Falcon and Wt Eagle. Photos & veg samples taken.

- Totals of chicks banded and flagged.

Argo and trailer left at Marmion.

Grant and Alan returned to Perth on ..

12/6 + 42

Air survey by Andy Chapman on Fri 14 July.

(See V2, folio yy for full report)

Ballard: 4 passes over lake. 6-7000 Stilt all flying, no further nesting

Marmion: 20-25 000, include. 10% chicks not flying but "coloured up". He reported gear (trailer + Argo) was OK at Marmion.

Other bird observations made (see V2 folio xx)

Flight was 3hrs, Piper Warrior, \$630 in toto.

Air survey of Ballard and Marmion Andy Chapman and .. on Tues 22 August 1995

Piper Warrior. (See V2, folio yy for full report)

Ballard: 4 traverses of lake. Western end dry. c11 500 stilt "all adults wading and flying" ..

Marmion: 7500 stilt, c20 incapable of flight.

10 August 1995 Andy and .. collected Argo and trailer from Marmion

Depth 5cm at sample point near camp. Salinity 63 ppt. Of c200 stilt observed from shore only 5-6% had bands on chests.

.....Sep? , Grant diverted from SW lakes survey (9-17/9) to Ballard to collect water level recorder.

Drove up from Esperance.

Retrieved Water level recorder from Ballard. Observations?

Brought gear back from Marmion (observations?) and Kal?

Tag publicity and sightings

Publicity for tags - Wingspan? WA Bird Notes (see my Vol 1, folio 113), Direct approaches, Mike Bamford. "Tattler"? Clive will do SA and Vic.

Subsequent sightings, by, on, where, implications,

8.

Mike Bamford reported 10 000 Banded Stilt at Port Hedland prior to Cyclone Bobby and none one week later.

Andy reported that on 24 October 1995, 1 stilt in flock of 300 in 2cm water at Lake Arrow 24km of Kalgoorlie was leg flagged (yellow). He is going to S coast over Xmas - observations??

Letter of late Nov 1995 from Mike Bamford.

Terri Llyod at Dumbleyung.

1 yellow flagged Stilt observed at Rotto on 21 Jan 1996.

Cargill Salt, Port Hedland, stilts began arriving 13 Feb 1996.

One yellow flagged stilt at Dampier Salt on 7 March 1996. Steve vL said BaSt have only begun arriving in past 2 weeks.

Grant saw 3 leg flagged and one banded Banded Stilt at Port Hedland Saltworks on 28 (check) Feb 1996.

↑ direction?

ABC film

half our program "Bobby and the Banded Stilt"

Film in final stages. 1st draft of narration. ... of film. Jeremy Hogarth to TVNZ.

Working on data with Clive as time permits for publication in Emu. Popular articles in Wingspan.

No plans for further work at this stage, snowed under.

Andy Chapman

Found nesting on Marmion (why looked? for reneesting?).

Finished

Travel claims, diaries (checked mine 15/5/96), vehicle logs,

Granr, Alan and Andy slides?

No reneesting as at Lake Torrens (Wingspan)

A copy of 'Bobby & The Banded Stilts: Narration Draft 1' with JL's edits as faxed (13/5/1996) by JL to David Luffman of ABC TV Natural History Unit.

References to brine shrimp, shrimp eggs, dormancy, fish, crustacea, salt crust, algae, bacteria, filling and drying, chicks feeding, premature drying, water depths, replenishment by rainfall, brine shrimp mating and dying are highlighted (blue).

FAXED

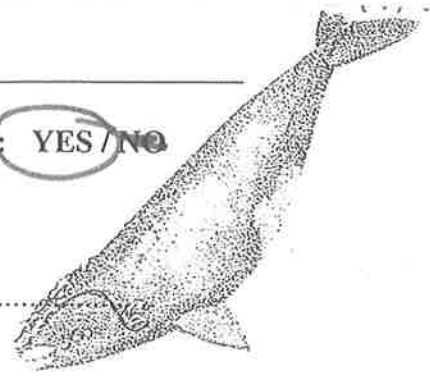
TO: DAVID LUFFMAN

URGENT: YES/NO YES NO

AT: ABC TV NAT. HIST.

Fax No.

FROM: JEM LANE



DATE: 13/5/96

Your Ref:
Local Ref:

Comments on Banded Stilt video

No. of pages inc. this page: 9

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nest, or breed.

01.31 Only in the 1930's was it realised that the answer to the mystery lay here, in the vast salt lakes far inland.

01.42 More especially, it lay buried in the salt itself:
01.50 in billions of tiny eggs - not dead, but dormant, waiting year after year, sometimes for a decade, for rain.

1.59 On February the 24th, 1995, it came

CYCLONE BOBBY - NEWSCAST

03.17 Far away from human settlements, across the normally arid inland, cyclone Bobby dumps four hundred ~~of~~ millimetres of rain in a mere four days.

03.34 Enormous quantities of water flow across the flat red earth towards the lowest point in the region - three great salt lakes five hundred kilometres from the nearest sea shore - Lakes Barlee, Ballard and Marmion.

BOBBY & THE BANDED STILTS: NARRATION DRAFT 1 J.H.

00.09 In the arid heart of Australia, a great salt lake shimmers in the heat. Few places on the surface of the earth appear so stark and lifeless.

00.23 There's barely a hint of moisture - only the harsh, dry desert winds. Yet here in a few days time, billions of tiny shrimp will swim, and ~~hundreds of~~ ^{billions of} thousand water birds will come to breed - and all because of a storm called Bobby.

Seventy /



TITLE: BOBBY AND THE BANDED STILTS

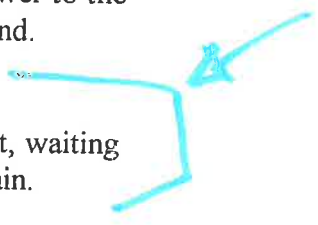
00.57 The Banded Stilt is one of Australia's commonest wading birds - and one of its most mysterious.

01.05 Unlike many waders that frequent these coasts, the stilts are not migrants, but permanent residents .

01.16 Yet for over a century after they were named for Western science, no ornithologist had ever seen them mate, or nest, or breed.

01.31 Only in the 1930's was it realised that the answer to the mystery lay here, in the vast salt lakes far inland.

01.42 More especially, it lay buried in the salt itself:
01.50 in billions of tiny eggs - not dead, but dormant, waiting year after year, sometimes for a decade, for rain.



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CYCLONE BOBBY - NEWSCAST

03.17 Far away from human settlements, across the normally arid inland, cyclone Bobby dumps four hundred ~~of~~ millimetres of rain in a mere four days.

X

03.34 Enormous quantities of water flow across the flat red earth towards the lowest point in the region - three great salt lakes five hundred kilometres from the nearest sea shore - Lakes Barlee, Ballard and Marmion.

- 03.52 Many Australian salt lakes, when they fill, are soon inhabited by millions of fish, washed in by seasonal rivers. Here there are no rivers, and no fish. (04.03) But there will soon be life in abundance. }
- 04.10 Within days billions of tiny crustacea are struggling free from the long-dormant eggs in the salt crust.. }
- 04.20 In the sunlit water, algae and bacteria are already multiplying to feed the brine shrimps. Soon the lakes will be a living soup. }
- 04.34 It's a minor miracle of nature. But hundreds of kilometres ~~to the west~~, a still more extraordinary event is taking place distant,
- 04.53 All up and down ^{Australia's} ~~the~~ western coast, the Banded Stilts are leaving. In flocks of thousands they head ~~to the east~~ inland.
- 05.21 The coast this far south wasn't in Cyclone Bobby's path. Here, it has hardly rained for ~~weeks~~ ^{months}.
- 05.30 So how have the birds learned that far inland, the salt lakes are filling, the brine shrimp are hatching? Nobody knows. Yet there's no hesitation. Only two or three times in their lives will the Banded Stilts get a chance to breed. }
- 06.14 Of the three enormous island-studded lakes which have suddenly appeared in the south-western outback, the ~~majority~~ majority of Banded Stilts choose only one - Lake Ballard.
- 06.29 Less than a week after the rains ceased, the birds have begun to arrive.
- 06.38 And they keep on coming. Some ^{may} have flown from as far away as Port Hedland, a thousand kilometres to the north ~~west~~.
- 07.02 Why do they prefer this lake to the others?
- 07.06 Why, of all the islands in Lake Ballard, do they choose to crowd together on just four? There are a host of questions without answers - because this is the first time ever that a Banded Stilt breeding event has been studied, and filmed, from start to finish.

BOBBY & THE BANDED STILTS: NARRATION DRAFT 1 J.H.

07.29 From the moment they arrive, there's an air of frantic urgency. All over the tiny island, birds are pairing off and trying to mate.

07.43 It may be only ^{two or three months} ~~a matter of weeks~~ before the Lake dries out - and there's a lot to do. ^

07.50 Everywhere, there are squabbles and fights over nest sites.

07.56 Why the birds feel the need to crowd so closely together is not entirely clear. There's no shortage of islands - and few predators to force them to seek safety in numbers.

08.08 And yet day after day, more Banded Stilts arrive, and the pressure for space increases.

08.37 To a human observer, there's no visible difference at all between the sexes. But despite the apparent chaos, the Stilts have already formed breeding pairs - a male and a female take joint responsibility for scraping out the nest hollow and defending it from encroaching neighbours.

09.18 *incubating* Males without mates resort to desperate measures. This one is trying to force his attentions on a female who's already ~~laying~~ incubating. Approaching the task from this end, he's no chance of success -

09.34 but he keeps on trying.

10.09 There are spats about everything - even a single leaf, which could be packed around the nest hollow to make it cosier, is the object of vigorous fencing.

is it? looks like shell membrane to me.

10.36 This looks like another unwelcome attempt at mating. The female keeps her head disdainfully erect - a sure sign that she's not interested in her suitor

11.00 Eventually, she seems to get tired of the business, and chucks him off

11.14 This is the way it should be done. The female's bill is outstretched, parallel with the ground, in a gesture of compliance, ~~or perhaps of pleasure~~ ^{wagging side to side}

11.32 After forty five seconds or so, the male hops off, and both birds perform a curious little dance of triumph.

BOBBY & THE BANDED STILTS: NARRATION DRAFT 1 J.H.

11.47 The island is full of drama - pursuit and rejection, ~~to~~ tiffs and reconciliations.

12.10 So urgent has been the response of the Stilts to Cyclone Bobby, that many of them are still growing their breeding plumage - the rich chestnut coloured band across the breast for which they're named, ~~shading to~~ a glossy black patch on the belly. *merging with*

12.26 Yet the birds with mottled breasts seem to fare just as well in the breeding stakes as those in full regalia.

12.33 This Stilt, with only the barest hint of a Band, has already laid her eggs. So why bother to grow breeding plumage at all? It's another mystery.

12.44 A mere fortnight since Cyclone Bobby passed by, the early arrivals have flown ~~at least~~ ^{to a thousand} five hundred kilometres, mated, and laid ~~a~~ ^{as} clutch of up to five enormous eggs. It's ~~one of the most astonishing feats~~ ^{one of the most impressive feats} in the avian world.

13.04 And still, through the days and nights of March, the breeding colony grows.

13.37 By early April, there are four separate colonies on Lake Ballard - around 70,000 thousand adult birds in all, or perhaps a quarter of the entire Banded Stilt population of Australia.

13.51 And yet the lake can feed them easily. It's now ~~seeing~~ ^{teeming} with brine shrimp. With no fish to check the increase, their population is growing at a phenomenal rate.

14.07 Within days of hatching, the shrimp are ready to mate.

14.22 Each female produces up to a hundred eggs, which will hatch in just three weeks.

14.29 And almost the only living creatures feeding on this wealth of protein are the Banded Stilts.

14.40 No other waders arrive to breed at Lake Ballard. Only the Stilts are adapted to feeding ~~in~~ ^{in such numbers} waters of such high salinity. And ~~its~~ ^{its} very remoteness means that very few predators ~~find~~ ^{have found} their way here.

and a few Avocet and breeding on shallow

BOBBY & THE BANDED STILTS: NARRATION DRAFT 1 J.H.

- 14.56 Less than five weeks after the end of the rains, the first chicks are hatching.
- 15.32 An hour or two in the sun will turn its down from soggy grey to fluffy white.
- 15.50 In other salt lakes, in other years, young chicks like these have been snapped up in their thousands by predatory ~~Silver-winged~~ Gulls. But the gulls never found the colony at Lake Ballard.
- 16.03 Yet there are dangers all around for the chicks - from their own kind. The nests are packed so tightly now that each adult bird's territory ends only centimetres from the nest. The chicks must stay close beneath the protection of their parents wings and bill.
- 16.30 A few false steps, and a chick has strayed out of the safety zone - immediately the other adults attack it.
- 16.55 With two other chicks to protect, the parent cant come to the rescue.
- 17.13 As the relentless harassment continues, the chick becomes disoriented - and staggers further into hostile territory.
- 17.31 The nesting birds are hypersensitive about the area immediately surrounding their nests - and the chick is tossed from one danger zone to the next.
- 18.03 Within ²⁴ hours of hatching, the chicks must get to the water to feed - the only way get there in relative safety is to be escorted by a parent through the gauntlet of nesting stilts.
- 18.16 The stray chick has to be abandoned, to make its own way if it can.
- 18.21 Even the parent ~~is vulnerable to attack -~~ ^{receives unwanted attention} in this case ~~what looks like attempted rape.~~ ^{from yet another amorous male.}
- 18.37 Desperately the third chick tries to catch up with its parent and siblings.
- 18.51 Usually, once they're clear of the nesting area and reach the open beach, the chicks are safe.
- 19.12 But in the first few days, the chicks were often attacked by other adults right on the water's edge.

BOBBY & THE BANDED STILTS: NARRATION DRAFT 1 J.H.

19.20 The parent rushes to their defence - but the attacks continue, ~~ruthlessly~~ *relentlessly*.

19.47 There's no obvious explanation for this continued bullying, for the beach is normally a place of free passage. After the first few days of hatching, this ~~apparently~~ *aggressive* ~~spiteful~~ behaviour was ~~never~~ *not* seen again.

20.02 The third chick, abandoned again to its fate, is reaching the end of its strength.

20.13 But it makes a last effort.

20.24 And at last it reaches the safety of the water. Though only a few hours old, it's able to feed itself immediately.

20.34 More and more families are escorted by a parent - usually the father - down to the water's edge.

20.47 And here, a remarkable transformation happens. ~~Pure spite - hostility for no apparent reason - is very rare in nature. And so is altruism - expending effort to help another creature who doesn't directly share your genes.~~ Now, quite suddenly, ~~the~~ adult stilts turn from bullies, to babysitters.

The aggression directed towards chicks of other broods - so evident on the island and shoreline - is replaced by co-operative parenting.

21.12 At first, parents and chicks ~~float~~ *head* out onto the lake in little family groups.

21.20 But gradually, the families coalesce, and ~~most~~ *many* of the adults leave.

21.30 Eventually only a few are left to shepherd the growing flocks. Each creche usually numbers forty or fifty chicks, minded by half a dozen adults. For days, they'll ~~be blown~~ *swim with the wind behind them* across the vast expanses of the lake, feeding on the brine shrimp as they go.

21.55 By the end of April, the chicks have ended up at the western end of the lake, fifty kilometres from the island.

22.03 Though more widely dispersed, they're still in their creches, still minded by their adult baby-sitters. But many are ~~half way to adulthood themselves.~~ *main nesting*
 half adult sizes

BOBBY & THE BANDED STILTS: NARRATION DRAFT 1 J.H.

X 22.16 Their down is being replaced by ~~new~~ ^{flight and body} feathers. But it will be some weeks yet before they're able to make the long ^{journey} ~~flight~~ to the coast, and it's vital that the water - and the shrimp - remain in the lake until then.

X 22.34 Sometimes in the past, the lakes where the Banded Stilts have bred have dried up prematurely - and thousands upon thousands of chicks have ~~had to be left to die.~~ ^{been}

X 22.56 But this time, ~~a~~ ^{the} further fall of rain has ^{refreshed} the lake.
 X 23.05 It's slowly emptying, and the chicks have to make short dashes across the muddy island foreshores from one patch of water to the next. But there'll be time for the chicks to ~~grow to maturity.~~ ^{fledge.}

22.19 Leaving the chicks and their minders behind, thousands of stilts are already leaving.

X 23.34 Two months after they arrived in the wake of Cyclone Bobby, ~~they~~ ^{many} head westward again towards the sea.

23.50 The colony is deserted. Thousands upon thousands of nest scrapes, dead chicks and rotting eggs are all that is left.

24.20 It looks like a disaster zone. But in fact it's been one of the most successful breeding events in years. Less than twenty percent of the eggs failed to hatch, and were abandoned to the maggots.

24.38 ^{few} The vast majority of the hatchlings, this year, will survive. There have been ~~no serious~~ predators; the lake water and the brine shrimp have lasted well;

24.49 As the water levels fall, the salinity of the lake is rising. It's a signal for the brine shrimp to perform their last rite: to ensure the survival of their species - and of the Banded Stilts as well.

25.07 As they sink to the bottom in their death throes, the females carry inside their bodies a different kind of egg, one with a hard outer casing which will be able to survive years of drought.

25.20 Like a shroud, the salt crust will crystalise around them.

25.39 The eggs, dormant but not dead, begin their long wait.

BOBBY & THE BANDED STILTS: NARRATION DRAFT 1 J.H.

(25.46 A few months after the passing of Cyclone Bobby, Lake Ballard will once more be a sheet of salt, lifeless and forbidding.)

25.55 And so it may stay for three years, or five, or a decade, until the next great storm brings it back to life, and the Banded Stilts return to breed again.

JL's fax (29/4/1996) to Jeremy Hogarth with additional comments on '... the 7 one hour tapes you sent me last year and ... the 29 min 20 sec video that Mark Lamble sent me (11/4/96 version)'. Inter alia, JL refers to: BaSt washing, chick dispersal (swimming), the 'very large webbed feet' of chicks, chick 'prey' (i.e. diet), chicks feeding, BaSt drinking and salinity tolerance.

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
BUSSELTON DISTRICT

FAX NO: (097) 521 432

FAXED

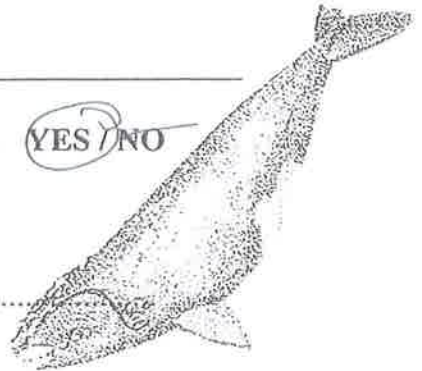
187.

TO: JEREMY HOGARTH URGENT: YES/NO

AT: TUNZ

FROM: JIM LANE

Fax No. 0011 64 3 4799 17



DATE: 29/4/96

Your Ref: _____
Local Ref: _____

No. of pages inc. this page: 3

Eagles and Peregrine Falcons. Although they did not take large numbers of chicks they were a significant feature of the breeding event (particularly from their point of view) and it would be good to include some footage in the video.

The Tape Three footage (from 0.43.23 to 0.43.48 - drinking from an egg?) of a Little Crow, although not great, looks usable. Starting at 0.48.39 there is also approx two and a half minutes of slow motion footage of a Little Crow flying and landing and then of it flying off with a downy chick in its beak. This also looks usable (though it's difficult for me to tell the quality from the tapes).

There is also footage of a Wedge-tailed Eagle in Tape Five (0.49.46 - 0.50.56). Presumably this was not good enough quality to use.

Tape Four

Between 0.09.08 and 0.15.39 of this tape there is footage of the very earliest stages of hatching. As mentioned in one of my previous faxes, I think it would be a great pity not to include some of this in the video. After re-examining all the tapes I also believe that the footage in the 11/4/96 video looks a little artificial and would be concerned that others viewing the final product may also form this opinion.

At 0.39.05 there is an attractive, approx 10 sec, sequence of three downy 1-2 day old chicks walking near the water's edge. This sequence shows better than any other how large their legs are in comparison with their bodies. If included in the video, there could be an accompanying

TO: JEREMY HOGARTH

SUBJECT: "STILTS" VIDEO

Since my last fax I have been right through the 7 one hour tapes you sent me last year and had another couple of looks at the 29 min 20 sec video that Mark Lamble sent me (11/4/96 version).

Additional comments I have are as follows.

Tape Two

Feather maintenance through washing and preening is an important part of the daily routine for nesting stilts and can be related to the need to maintain their flight feathers for the return flight to the coast. However, there is only very limited footage (one second - from 0.16.15 to 0.16.16) of washing in the video and a fairly short sequence (from 0.12.01 - 0.12.05) of preening.

There are some lengthy sequences of washing at 0.18.06 in Tape Two that would appear suitable for inclusion and if this could be done it would add significantly to the video.

There is also additional preening footage in Tape Two and at the end of Tapes One and Seven which could perhaps be included, though this is less important.

Tape Three

Predators/scavengers at the breeding colonies were Little Crows, Brown Falcons, Wedge-tailed Eagles and Peregrine Falcons. Although they did not take large numbers of chicks they were a significant feature of the breeding event (particularly from their point of view) and it would be good to include some footage in the video.

The Tape Three footage (from 0.43.23 to 0.43.48 - drinking from an egg?) of a Little Crow, although not great, looks usable. Starting at 0.48.39 there is also approx two and a half minutes of slow motion footage of a Little Crow flying and landing and then of it flying off with a downy chick in its beak. This also looks usable (though it's difficult for me to tell the quality from the tapes).

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At 0.39.05 there is an attractive, approx 10 sec, sequence of three downy 1-2 day old chicks walking near the water's edge. This sequence shows better than any other how large their legs are in comparison with their bodies. If included in the video, there could be an accompanying

comment relating the size of the legs to the chicks' rapid dispersal from the colony (which is not simply "wind driven") and their need to catch prey soon after hatching.

At 0.40.40 there are a couple of seconds of footage showing the very large webbed feet of these chicks. Perhaps this sequence could also be included? in slow motion?

Tape Six

There is virtually no footage of fledged or almost fledged, chicks in the 11/4/96 video. It seems to me this is a significant omission.

There is good footage, some closeup, of fledged or almost fledged chicks feeding in shallows from 0.43.50 onwards in Tape Six (particularly at 0.47.30 and 0.54.10). Look for the large chicks with no down on their wing feathers. There is also footage of near-fledged chicks at the beginning of Tape Seven

Also, the footage of a muddy-bellied chick feeding in the tracks of the Argo (6 wheel vehicle) should be replaced. Both the habitat (mounded muddy terrain) and chick's plumage condition (muddy) are artificial, particularly the habitat.

Tape Seven

I think the best footage obtained of families leaving the colony is in the first fifteen minutes (and some later sequences) of this tape. I say this because the camera angle is wide enough to see all the action and there are long, uninterrupted sequences following family parties from the edge of the colony all the way to the shoreline and then out onto the lake. These sequences also show how well most parents deal with interference by other stilts. They also show (though not closeup) adult stilts drinking when they reach the water's edge (there is no footage of drinking in the video, see 0.22.00 below).

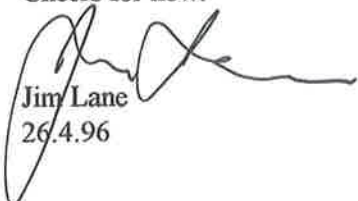
At 0.12.22 - 13.01 there is good footage showing two families joining together when they reach the shallows and then heading out onto the lake. Although such behaviour is implied in the video it is not clearly shown. Given the significance of creche formation it would be good to show this first merging of families. It also makes an interesting contrast with the aggressive/defensive interactions on the island and at the water's edge immediately beforehand.

22.00 - 0.22.15 shows an adult stilt (with chicks) drinking when it reaches the water's edge. If used, the accompanying commentary could refer to the salinity of water (which we can determine fairly precisely if given the date on which this footage was taken) and the ability of stilts to cope with high salinities.

That's it.

I am on long service leave until next Monday but can be contacted at home until then if need be.

Cheers for now.


Jim Lane
26.4.96

One page of 'Notes / Ideas' (by JL, undated, but probably late April 1996) relating to the content of (videos) Tape One to Tape Seven (all or nearly all of the ABC Natural History Unit's filming) for 'Bobby and the Banded Stilt'. Includes reference to: BaSt food supplies; salt glands; feeding during the incubation period; film of BaSt swallowing action; prey; rain maintaining water levels, food source depletion and BaSt behaviour, webbed feet and dispersal, wind and high turbidity.

NOTES / IDEAS

170

- advantageous to dispense rapidly & widely from nesting island (food supplies) linked to aggression?
- yes, 3rd eye often do appear small.
- is the head profile unusual? salt glands?
- importance of washing / preening to maintain plumage
- all ♂ were in good condition when shot with chicks? significance? e.g. for feeding during incubation period?
- regurgitation (feathers only?) in some adults with chicks - not evident in other or some birds - which?
- slow motion to show swallowing action? prey?
- a lot of unused feeding (+ washing) fat (check final video).
- RCP footage not used - not good enough?
- comment on long birds plumage?
- comment on difference in size of chicks in same brood.
- use little Crow footage (predator)
- could make the point that ^{extra} rain kept water levels up
- they breed on the smallest of the many islands - show island sizes
- small islands also offer best views of approaching predators.
- purpose of aggression may be to dispense chicks as quickly as possible so food source not depleted. No - no aggression between families.
- have average of 2. whether cause can only protect 2....
- wetted feet - dropped? any other eggs with
- was fat of large chicks used?
- mud on chicks unusual & due to algae trides.
- comment on wind & high humidity?

15 pages of notes (all by JL, undated, but probably late April 1996) referring to and describing in considerable detail the content of (videos) Tape One to Tape Seven (all or nearly all of the filming) for 'Bobby and the Banded Stilt'. Reference is made to: BaSt swimming, washing, feeding, pecking in shallows, wading, webbed feet, feeding by up-ending, lowering black belly feathers when settling on eggs, damp mud, running, walking, drinking; waves; 'aquarium footage of *Parartemia* [and other, much smaller invertebrates?] swimming about'; '*Daphnia*?'; *Parartemia* mating? shedding eggs? male/female ratio; mosquito?; etc. TO DO: Copy remaining (JL has already copied one or more of these) video tapes to DVD. Obtain DVD copy (Ian Kealley has made one) of final 'Bobby and the Banded Stilt' video.

TAPE ONE

- 00.00 aerial of 1st colony (Belard)
- 00.00 min. sec numerous
- 16. — several perches at lower + lower levels, resting birds rising
- ~~00.16~~ aerials of another island^(S) and mainland
- 20.48 ground shots of breeding stilt on 1st island; incubating birds attempted copulations, plunges, walking, preening, changing positions on eggs, long legs, pecking, unattended eggs in open, many birds standing/walking in colony,
- 25.21 "this roll is 1B" (words spoken)
- 25.23 contraction, sitting birds feeding off potential copulators, preening (bills), sleeping on nest,
- 30.27 partially webbed feet
- 30.30 contraction
- 31.19 "abandoned" eggs
- 31.25 contraction, chasing thru colony,
- 37.35 resting birds "playing" with piece of shell. (used in video)
- 39.30 open bill
- 39.40 contraction.
- 40.14 successful copulation.
- 42.45 MC Roll 5 state 1. in picture - (but voice said "roll 2A")
- 43. — contraction of incubating stilt on 1st island.
- 44 — masses of birds flying up from nests, disturbed by me (?), returning to nests,
- 48-30 MC a great morning thru colony with PVC quadrant, photographing nests. (49.35 finished)
- 49.40 contraction of birds on nests
- 51. — copulation (successful?)
- 51.50 sky, cloud, rain in distance beyond colony.
- 52.20 contraction of birds on nests (1st colony). [53.04 voice "this is 2B"]
- 55: — preening birds closeup.
- 56.05 2 ♂♂ swimming together, taking off.



TAPE ONE Contd

- 56.30 Still sitting on eggs, closeups. birds walking about, closeups ~~the~~ bills slightly upturned, pairs of B&W flying in, groups flying in, plummages, on nest, pecking at and moving debris, scratching head with foot (leg over wing)
- 1.01.58 Still parting. (not good enough to use)
- 1.02.— continuation
- 1.02.50 End of Tape one.

TAPE TWO

- 00.10 "words" continue 2B"
continuation of incubating birds on 1st island colony, feeding, birds on water, preening, pecking at each other, birds in shallows. plummages, standing, walking, calling (searching?), washing, preening, water's edge, chasing,
- 03.20 Black pointed Plover?
- 04.19 continuation, wading, sitting, pecking at ground, etc.
walking through colony, dragging in, sunbat profiles of birds,
- 07.45 new day, continuation of foraging in hot resting colony, sitting birds, attempted copulation (long),
- 11.30 ~~the~~ voice saying "reel 3, wading, washing, feeding". birds doing that; flying, swimming,
- 13.25 MC approaching island in shallows, wading, preening, feeding, flying, landing, masses in flight (presumably one disturbing them) feeding (pecking) in shallows, wading (18.06) (long),
- 20.40 MC Roll 9 (Sketch 1?) in view. sitting on eggs, feeding in shallows, continuation in resting colony, flying etc., washing, preening, feeding,
- 31.10 MC Roll 10 (Sketch 1?) in view
continuation of wading, feeding etc. in shallows,

Tape Two contd

- 32.50. Ground level shot of 2nd Breeding Island (first film of this). General shot of nesting colony, birds in shallows, flying, cloud, rain in distance, cliff at one end (E) of island, disturbed birds flying, settling, 39.29 voice saying "roll 3". 41.55 RML Roll 11 slate 1 again, held by Cam.... continuation of filming of disturbed birds on 2nd breeding island, flight (pairs),
- 46.05 voice saying "continuing Roll 3". Silhouettes of sitting still, looks like back on 1st breeding island (at sunset).
- 49.19 wide angle film of 1st ~~(S)~~ breeding island. Then of sitting still. ~~and~~ ~~takeover~~ date in afternoon.
- 51.03 flying still, flocks & pairs,
- 51.50 Closing of Red-capped Plover. (don't use - appears to be necessary to camera)
- 52.30 ~~take~~ continuation of flying still.
- 53.20 Disturb of R.A.P. and Plover
- 53.40 continuation of flying.
- 54.00 RML Roll 12 Slate 1 but voice says "roll 4"?
- 54 - closing of eggs in nest with sitting birds behind, birds returning to sit on eggs, changing positions on eggs,
- 57.34 One bird with well developed chest band tries to get onto eggs of 2nd bird with similar chest band when it changes its position on eggs. Unsuccessful - driven off.
- 58.10 2 birds settling on eggs, closing - used in video. more shots of birds settling on eggs - closing. Masses of disturbed birds. 1.02.03 me in darkest background. Birds back on nests.
- 1.02.42 End of Tape Two.

not good enough to use.

Tape Three

00.00 voice saying "this is Roll 4 contd". Incubating still on 1st breeding island. ^{Disturbed} Birds returning to sit on eggs in foreground.

Tape THREE Contd

02.06 First ^{stage} piten of chick (fluffy) in ^{used} nest (with egg).
closing of debris around nest & bird settling in (rear end, legs),
settling on egg, 05.20 webbed feet - not great shot. - long
sequences.

07.30 Adults pecking at sitting chick, then adult settling over,
more pecking of chick, more adult settling over,

09.03 2 chicks walking with adults to the shore. One is
bigger & more ~~stead~~ steady on feet, adult attempting to
copulate with chick. Defensive adult has full chest head & slightly
lowered belly feathers. 1 very persistent bird attempting to mount
chicks has imperfect head. 2 other also driven off. Reach water
edge.

12. — another chick being protected by 1 adult (sitting) from attacks by
neighbours. Flying still, walking, feeding (upending),

14.54 Re Avocet (2) in mid distance, still ~~settling~~ nearby.

15.30 ~~On~~ Back among sitting birds.

16.25 Voice says "still the last Roll of four"

17. — sitting chicks being attacked by adults, — not close. Sheltering
under wings of adult.

19.35 Attempted copulation on shoreline. Adult sheltering chicks
under wings at water edge. Full chest head, lowered belly
feathers. Chicks walking about on their own. 1 larger
Attacked by birds with incomplete plunges. Smaller chicks ~~also~~
wings (stumps) a lot whereas larger chick in brood does not.
Attempted copulation with bird sheltering 2 chicks - did not cooperate.
~~Attempts~~ on Treading on chicks (attempted copulation). Another attempt
to copulate with adult sheltering chicks. Goggles attacking chicks
in water.

31:50 Voice says "Roll 5". Chicks in water still being "attacked"

33.30 Chick being attacked on land.

Tape Three contd
black.

34.07 ↓ Good shot shows a bird approach the nest, then lower its belly feathers as it settles onto eggs. Similar shot of bird in distance.

Birds sitting. 2 chicks on the move with 5! adults, but only 1 with lowered belly feathers. Sitting birds.

38.25 4 chicks on water with 1 adult (swimming). (Initially 3 adults with 5 chicks - split up occurred)

38.51 Roll 17 slate 1 - Voice says "Roll 5".

39.45 1 chick + 1 egg + 1 standing adult, which settles on them (in nest) Duck chest band. lowered belly feathers. Juncing with neighbour.

3 chicks heading for shore. The one protective adult has full chest band, but not lowered belly feathers, the 2 following "aggressor" birds are not fully developed. Pursued by up to 5 "adults" in shallows. Parent belly feathers not lowered when moving into deeper water either. Family ~~swims~~ reaches water ok

43.23-48 ~~43.23-48~~ (26 sec) Film of little Crow N. looks ok to me. Picking at something.

43.52 Adult brooding 2 chicks in water + 1 next to it.

44.10 Chicks on ground - food on.

44.35 Voice says "Roll 5". Slits flying - slow motion.

49.30 Roll 18 slate 1 in view. More slits flying, landing,

56.06 Slits feeding in shallows in mid distance. Upending slits.

57.10 Slits flying, slow motion.

57.35 General resting among slits.

58.35 large scale disturbance. Return to nests. Sunset behind colony (wide angle)

1:00:09 Slits flying, slow motion.

1:01:35 MC Roll 16 slate 1 visible.

1:01:59 end of Tape Three.



TAPE FOUR

- 00.03 "ML Roll 20 Steel 1" in view - Voice says "This is Roll 6".
- 00.51 Broken egg - yolk spread on ground. Start with damaged right leg?
- 00.58 - 01.24 Dragon lizard on 1st breeding island.
- 01.25 Hatching chicks putting feet free from shell pieces, adult sitting on it, chick puts its head up for first drink,
- 04.04 Adult with chick standing under each wing, ~~chick~~ has full chest bands, preening at same time,
- 04.22 Back to newly hatched chick - adult steps on head.
- 04.34 3 adults on nests attacking a chick in space between them.
- 04.50 Adult settles on newly hatched chick (cover it). Adult off nest + can see chick. Adult on again, can just see chicks bill out of adult feathers. Now 2 newly hatched chicks in nest + adult settles on them. Adult changing position on chicks. Imperfect chest band.
- 09.08 Adult settling on eggs, one of which has small prep with chick bill tip ^{visible}.
- 09.35 Prep hole, chick bill visible, egg cavity open, adult settles over ^{in egg}
- ~~10.35~~ Prep hole now larger, can see that chick is breathing (bill movements) hole larger still, 12:14 half of shell removed - unattractive, more of adult settling over hatching chicks, ^{adult} stretching sand backwards with legs (out of nest scrape). Move of 1/2 open egg + adult settling,
- 15.39 Fluffy (just) chick setting next to egg, adult settles on it, head shape of adult,
- 15.42 Back to a hatching chick, feet come free, adult settling, wings of chick,
- 18.00 Fluffy chick + 1 or 2 eggs in nest. Adult settles on them, (seems a good shot).
- 18.25 Back to newly hatching chick, adult settling,
- 19.48 One chick hatching, fluffy chick behind, plus a 3rd egg? ~~adult~~ ^{adult} ~~pre~~ Parent pecks at hatching egg. Adult belly feathers lowered as it settles on eggs/gunny. 3 fluffy chicks together being pecked by adult. Parent attempting to protect (cover)

TAPE FOUR CONTD

~~00.22~~ 0.22. — more of fluffy chicks at nest, one with egg alongside
fluffy chick pecking in nest in shadow of parent. Chicks being attended,

Bill of chick held by attending adult,

00.25.30 - Fluffy chick in open, near nest of others, some attended,

Note that sitting adults don't leave

00.26.50 - Some chicks (attended) ~~staying or gone~~ looking very weak,
but gets up and wobbles.

00.27.35 - More of chicks being attended in colonies by sitting adults.

00.28.16 - 28.35 Raptor overhead - Keestrak??

28.45 - Chicks being led to shoreline.

29.05 More of attended in colony. Parent goes

30-32 Parent provides shelter, 1 then 2 chicks reach it, & third breaks
free from sitting bird collecting it and ^{also} joins the parent, they wobble off
for shore. Actually has 4 chicks!

31-37 1 adult with 2 chicks

31-50 2 Chicks + 1 adult pecking in shallows at edge

37.26 1 adult + 3 chicks walking with cross wind (used in video).

lowered (partially) belly feathers. Offers shelter at water edge

33-50 2 adults + chicks in shallows. 1 adult + 4 chicks in shallows.

~~37.20~~ 37.20 2d more of similar, attends on chicks at water's edge,
more sheltering of chicks, chicks pecking in shallows, lowered
belly feathers, pushing other chicks away (is not its own).

37.30 (Red capped Plover on shoreline with shells.

37.49 1 adult leading 3 chicks to shoreline, more of chicks + adult
in shallows. etc.

39.05 Large size of chick legs very evident (3 chicks)

39.20 More of adults + chicks in shallows. More parents being led
down from nest area,

40.40 large feet (webbed) of chicks. Chicks pecking (pecking)
evidently. More of ~~the~~ chicks/adults in shallows.

↑
used

TAPE FOUR CONT'D

- 41.40. - chicks + adult at waters edge.
- 42.00. wide angle of 1st nesting colony - elevated shots from crane? Camera going up + down several times for elevated views.
- 45.10. Slow motion of flying stilt. Landing on land + water. Wing markings. Singles + pairs. Wing shape is that of? Slapping except when slow motion
- 48.39 little cove flying just ~~off~~ out landing. More of its flying. stilt in background. fluffy chick in back + stilt flying away. Acoust? chasing cove → 51.30
- 51.30 Slow motion of stilt flying + landing in colony. More flying. Haven't seen any sign of wing moult in any birds. Landing on water.
- 54.35 "Mc Rull 23 Stilt 1" in view. Party of 10 chicks + 20 chicks on water. More of parties on water. Moving away. Chicks still small + fluffy. Note that wind has been evident in all water shots. More of family parties swimming. Sometimes in opposite direction to waves. Some of these adult feeding also. Adult: chick = approx 1:2.5 ratio.
- 1.00.53, Vegetation covered Crossover lake? Drizzle $\frac{3}{4}$, Rain on vegetation + in shallows. + on water - large rain drops.
- 1.03.09 End of tape.

TAPE FIVE

- 0.00.00. Aerial views of Lake Bellard. Water fairly calm. Penicillium Penicillium of root in water. Close views of large vegetated islands.
- 0.16.05. Ground levels of waves in shallows in last light. Sharp shots over island + water.
- 0.17.02. Panning across 1st breeding island after it has been totally decimated. Empty nests, scattered eggs, debris -

Tape FIVE Contd

0.18. — more sunset shots over islands & lake.

0.19.23 - sun setting over veg.

0.20. — empty colony again. Adhded eggs in nest (closeup) and scattered ~~over~~ over colony. Also vegetation regrowing on island. Yellow flower ⁽ⁱ⁾ on nesting island. Closeup of flower. What is it? (at approx 0.24.45). More of egg remains, Eggshell + membrane blowing in wind. Remains of dead chicks. Voice says "this is Roll 8 ~~too~~ by the way and the one with the chicks was also Roll 8". Closeup of eggshell being sandblasted by wind. More of empty nests & egg remains.

repeat footage

0.30.16 Voice says this is "Roll 8". Waves in shallows at sunset. Island & ~~shallow~~ lake at sunset.

0.31.13 - Panning across ^{lot} nesting colony. (abandoned). Looks identical to earlier vision. More of waves & shoreline at sunset. Lake at sunset. Sun going down. Lake at sunset. ~~that~~ Sun going down over vegetation. This is a re-run of footage earlier in this video (Tape 5). etc etc. More of abandoned nest area.

0.35.58 - ML Roll 28 Skete in view. Voice says "more shot from Roll 8" Dead trees of Camp Island. Other vegetation of this island (& perhaps other islands) - at ground level. Edge of lake.

0.38.05. Hundreds of Skete (adults + chicks) feeding at edge of lake (west end ~~of~~) ✓. Flying about. All in mid distance. Close to lake edge. Swimming. Flock of 100 or flying. Mob of many hundreds in water in distance & ~~more~~

0.42.26. ^{RL} Roll 30 Skete 1 in view and voice says "Roll 9". Continuation of the Skete (adults + chicks?) in large flocks feeding in water and still flying - all in mid distance.

TAPE FIVE CONTD

- continue scenes of previous page. Nothing close.
- 0.49.46 Raptor lands. Takes off. Lands. Wedge tailed Eagle!
takes off again. This way. Lands out of sight. → 50.56.
- 0.50.58 : Glassy lake surface.
- 0.51.22 ~~0.51.22~~ Voice says "Roll 9 again" (?)
- 0.51.25 : continue travelling at ground level (?) (in Arja) showing glassy water and passing low island.
- 52.29. "Maggots" eating nest debris.
- 53.45. Sunset scenes over lake
- 54.01 Abandoned colony scenes again (not resting water again).
- 55.11 Bird flying low over lake. What is it? Avocet??
- 55.34 2 avocet in distance
- 55.45 edge of abandoned colony. More nest debris and old eggs.
- 59.07 spider in web. (Orb spider).
- 59.30 Voice says "still Roll 9".
- ~~0.59.52~~ more of spider.
- 1.00.15 Agave in footage of Paratemia swimming about. Also other, much smaller, invertebrates?
- 1.02.20 MC Roll 30 slate .. in view
- 1.02.36 " " 31 " in view
- 1.02.37 End of Tape 5.

TAPE SIX

- 0.00.00 Paratemia in agave in (and other small invertebrates) - "Daphnia" ?
Mating? Shedding eggs?
- 0.05.00 "Algae" ? dead on surface. Continue with Paratemia.
- 0.07.25 "Daphnia". Continue with Paratemia. What is blue colour?
- 0.09.30 Many more females than males - synchronous?

TAPE SIDE Contd

- 0.10.08 Voice says "Tine, Roll 10"
- 0.11.50 ♀ with empty egg sac. Parasitic storming continues.
- 0.12.48 Voice ~~the~~ says "This is 10 again". Abandoned
- Still nests and eggs on ~~rocks~~ ^{1st} first nesting island.
- 0.14.29 Sunset scenes over ^{1st} nesting island (abandoned).
- 0.16.21 Abandoned nests + eggs again.
- 0.17.48 Sunset scenes over 1st breeding island (abandoned).
- 0.18.04 Abandoned nests + eggs again.
- 0.19.55 Slate needs N/E roll? slate in view. Abandoned nests + eggs continues. Course is of 2nd nesting island?
- 0.24.40 Large Skitt chicks feeding along shoreline (in shallows) in scattered flock. A few adults among them.
- 0.25.20 Other individuals on shoreline - greases?
- 0.25.25 Skitt large chicks + adults feeding in shallows. Mild distance. Some scenes of pecking at surface, others of head under water.
- 0.28.00 Feeding birds close to camera now. Many scattered in distance also. Feeding of each individual is quite independent.
- 0.30.00 Solitary chicks feeding close to camera. Fast rate of feeding.
- 0.31.40 Adults feeding. Then continue with large chicks.
- 0.33.00 General shot (wide angle) of feeding chicks + adults. Note that most of the feeding shot are belly (top of leg) deep. (3) welwing.
- 0.36.30 Red sand + green vegetation on sand dunes in background of feeding chicks + adults.
- 0.38.50 Pecking adults (2). Feeding chicks (owning + ducking head deep under)
- 0.40.09 Thousands of adult + chicks feeding in distance, + flying - pecking shot.
- 0.41.04 Adults feeding close to camera. Walloping, head under water when catching prey.
- 0.42.00 Adults + large chicks at edge of mudflat end in very shallow water

rest end of Lake Ballard

TAPE SIX contd

- Continuation of adults + large chicks feeding in very shallow water - continuation.
- 0.44.06 Chicks with well developed wings.
- 45.12 Chicks + adults running away from camera. Continuation of thousands in shallow water.
- 46.20 Chicks (some very large) feeding on damp mud.
- 47.30 Very large chicks feeding close. Can probably fly. Younger ones with it.
- 48.56 Thousands of chicks - adults scattered over damp mud + very shallow water - feeding.
- 0.50. — A few pools of water on mud. Very nearly dry. Still adults + chicks in darkness. Running across mud. Picking up mud.
- 0.53.16 Large chicks feeding in shallow water close to camera.
- 0.55.25 Chicks getting muddier (in tracks of Argo?).
- 0.56.00 Adult on one leg preening.
- 0.56.34 Chick feeding in wheel tracks of Argo again. Very close.
- 0.58.20 Slow motion of muddier chick feeding + stretching.
- 0.59.37 Voice says "this is that it" ... (unintelligible).
- 1.00.16 Back to normal speed (still in Argo tracks).
- 1.00.36 Chicks feeding in shallow water in mud darkness.
- 1.00.28 Adult flying + landing near feeding chicks in shallow. Continuation.
- 1.02.02 Chicks feeding next to Argo tracks.
- 1.02.20 1.02.42. End of tape.

TAPE SEVEN

- 0.00.01 Closing large Shell chicks feeding in Argo tracks - wet/puddly feathers. v. large chicks. Adult. feeding in v. shallow water.
- 0.02.55 Slow motion feeding (chicks + adult)
- 0.03.43 Change of Red-necked Avocet feeding or walking. One, then 2.
- 0.04.48 1 Shell leading 2 chicks down from colony. 2 ³ "immature" adults move in. Defence. attempted copulation with chick.

TAPE SEVEN Contd.

contraction

0.07.54 adult drinking

contraction of 1 adult leading 2 chicks down from colony, into water. This is the longest uninterrupted footage of the process and the most interesting (accidentally) - Not too close so can see what's going on around. (Incident at 0.10.28.

0.10.29 - More chicks leaving colony.

0.11.15 ~~best~~ best footage of adult attempting to copulate with chick.

0.11.20 contraction (1 adult + 2 chicks + 2 curious adults)

0.12.20 1 adult drinking

(3 chicks)

0.12.22 contraction. Joining another family in water + dwelling together
→ 0.13.01.

0.13.24 Another 1 adult with 2 ~~other~~ chicks leaving colony. 1-4 curious adults down off. → 15.12.

0.15.14 more of chicks reaching water, and swimming in distance.

0.16.12 Most desirable behind camera

0.16.14 contraction. 2 chicks among adults at water edge. ^{Parent} ~~Adult~~
driving off other adults

0.18.16 Another family (1 adult + 1 chick) leaving colony. 3 chicks at water edge.

0.20.32 Red-eyed flour → ~~21.50~~ 21.50

21.50 more chicks leaving colony.

22.00 → 22.15 1 adult (with chick) drinking when reaches water
(best drinking shot yet)

22.20 Another ~~for~~ parent + 2 chicks leaving. 1 adult + 1 chick. chick seems to drink (24.00).

24.13 Another parent with 3 chicks. Parent shelters chicks

25.07 Adults feeding in distance among veg.

25.28 1 adult on nest, settling on egg, plucking, settling, dropping debris to nest; eggs lying about, general of colony (1st) at water edge,

TARE SEVEN Cont'd

continuation, sparring between birds on nest, plumes, settling on eggs

0.29.10 Mark Lumble

29.12 continuation

29.22 settling on eggs after major disturbance, lowest belly feathers, plumes,

30.18 eggshell in ~~water~~ waves at shoreline

30.30 general of nesting colony (occupied), adults in water, nesting colony, birds, flying in (poor), etc., pecking at exposed egg (33.03) settling on eggs, mass disturbance (flight), some show motion landing!

34.32 Voice says "shells are 12, Cameron's footage, shells ~~roll~~ roll out the nest shell" (?).

34.45 continuation, mass landing of disturbed birds on water, on island, flying.

35.56 general of occupied nesting area, adults in shallow nearby (breeding), flying, washing, preening, etc,

38.50 Chick at edge of colony being attracted.

39.20 Me ~~or~~ start disturbing the nesting shells from the lot breeding colony,

40.14 my horn trousers - Testing egg warmth - birds disturbed & resettling ch

41.15 Me photographing in nest area, horn trousers, disturbed birds, chicks

42.40 Me walking with horn trousers

Stake reads ~~roll~~ CM Roll 2 Stake 1 Voice says "this is shell Roll 12, Cameron's stuff, pretty shot at night."

43.05 Barbet shots over lot breeding island & lake.

~~44.53~~ Water edge

44.56 Clumps of red flowers + other plants, yellow flower + native (?), bee feeding (good quality), ladybird, succulent plant,

TAPE SEVEN CONTD

Continuation, red leaved plant, etc, mouse flowers, trees of surrounding country, bushes, other flower,

0.55.55 ^{voice} _{ago} "Running at the moment is 13 and its Campbell's stuff"

~~55.260~~

0.56.00 Continuation - par across surrounding country from e hill top, Lake in distance

57.10 red seed of dunes near lake (^{legely} vegetated), yellow flowering vege. other lake side vege., ^{red} sand blowing in strong wind,

1.01.55 most amble proking ago than shelters water, Lake and birds (still) in distance + nearby,

1.02.33 End of tape.

Several pages from faxed (25/4/1996) copy of 'Transcription of Comments while Watching Un-Cut Rushes of Banded Stilts on Lake Ballard'. Present: CDTM, Mark Lamble, David Luffman, Jeremy Hogarth. Recorded at ABC Natural History Unit, 1995. These pages make reference to: feeding and drinking by incubating BaSt; BaSt drying by preening; BaSt don't just wade they also swim; feeding techniques and morphology, large eyes, touch; dunking, social aspects of feeding; feeding frequency; change-overs at nest; brine shrimp; diet; feeding techniques, pecking, swallowing; feeding success, bivalves; walking, swimming; water depth; shallows, mud; wading; feeding at night; effects of wind on water depths (tilting).

147.

TRANSCRIPTION OF COMMENTS WHILE WATCHING UN-CUT RUSHES OF
BANDED STILTS ON LAKE BALLARD.

PRESENT: Dr Clive Minton, Mark Lample, David Luffman, Jeremy Hogarth.
Recorded at ABC Natural History Unit, 1995.

TAPE START.

Clive Minton:

".....there's a bird trying to mate with an incubating bird - well that is interesting. I saw it happening everywhere but never on an incubating bird.

There's a very good example of a bird in very little breeding plumage a month after the colony started. When we first went there there were 25% of the birds that had not gone into breeding plumage, they were mating, breeding, laying eggs, sitting on eggs even incubating in some cases with no breeding plumage and in other cases with only a bit of it. By the time I was there in early April I didn't see any without full breeding plumage.

What's going on here? Is it attempted copulation? Is it two trying to copulate on one - not very willing co-operation.

Just slightly speeded up like this if [the colony] looks just like the main street of Tokyo.

Jeremy: There's no way you can distinguish the sexes?

Clive: No. You see, there's a beautiful bird there in the middle in terms of plumage, that one there with a solid chest band, but no we tried, ah, we saw birds like that with birds with flecked plumage on top of them and we couldn't tell. The ones that we collected and gutted and sexed I tried to predict what sex they were before we knew and I couldn't get it right.

That's someone wanting to mate, but is it wanting to mate with its mate or someone else's mate? He's still got the urge but I don't think he's trying to take over the incubation or anything like that. Now he's being more gentle perhaps, seeing if that will perhaps work. But will he succeed, we'll have to wait and see. Only Mark will remember.

Now that's copulation actually taking place. Yes, this is very interesting. I never saw any of this [attempted copulation] Mark, attempts to copulate with incubating birds. Now there's a very good example of a male in very poor breeding plumage attempting to mate with a bird in very good plumage.

Jeremy: Are the eggs lying around abandoned?

Clive: Those are just the rubbish of abandoned eggs. In each of those squares [transects] about six hundred eggs were laid and I counted the eggs in those pegged squares afterwards and there were about a hundred on average that hadn't hatched, now that looked awful but it's only about 15%.

This is now roll 8.

Clive. Any bird that is walking around is doing it for a purpose. What I think the majority are - are birds that have just arrived, but there are a few too many there just doing it., but birds which have either just decided to leave the nest and go down to the shore to feed or drink, or birds which have just returned from the shore after feeding or drinking and have landed, but they don't seem to land right by their nest but about twenty, thirty or forty metres away and then they wander through the colony to find their nests. Now, by watching a bird fly in then by watching it wander around and either sit on an empty nest - sorry, a nest that hadn't got a bird on, or come back and come to a nest, the birds would look at each other, the other bird would stand up and the other would sit down, and the one that had stood up would shake itself down and walk off through the colony to the shore and then fly away. And a few times I genuinely think they got lost and couldn't find their way back to their nest and they took quite a time, others were very quick at finding their way back.

Jeremy. Is there any calling when they are looking for the nest?

Clive. I don't know. I can't hear, and anyway there is so much yapping going on in the whole area, it's rather like a whole lot of little dogs yapping, it's a continuous noise the whole time. But whether every bird coming back to the nest is calling and trying to get a response from its mate - I don't think so.

Now that sort of process [scratching] that a bird goes through when it has either just got off the nest, it stretches a bit and scratches itself before leaving, but it's also gone through some extensive preening and I think it is drying itself off if it is a bird that has just come from the water. They don't just come straight onto the nest, they go through - during the course of their getting back to the nest they go through quite a bit of preening.

Now [reacting to sitting birds pecking at each other] that just shows how they are within pecking distance of each other.

And of course, when you see them on the water you notice that this is a wading bird that swims and not just wades.

The other point to make is that in general wading birds, the ones that feed by sight have a big eye, like the Plovers. And the ones that feed by touch have a very small eye, like the Sandpipers. The Banded Stilts are an exception to that, they have an incredibly tiny eye because they live on water in funny places and it must just get an incredibly dazzling light, so it really has to have a small eye, I think. But it does feed by sight, but it does have a small eye. [To Mark] Did you get any of that dunking behaviour when the birds would dash down to the water and suddenly drop themselves into it, fluff up their feathers and wet them, and then return back to the nest?

Mark. No, we didn't see any of that. Jim didn't think that it ever got hot enough for that behaviour when we were there.

Jeremy. When they feed, do they feed as individuals or do they feed in groups?

Clive. As individuals, there is nothing like the group feeding of pelicans or cormorants when they are driving things before them. Banded Stilts feed entirely as individuals. They come down from the nest to bathe and drink, when they are off duty. There's one having a bit of a feed.

Jeremy. Those one are just washing, are they?

Clive. Yes.

Jeremy. Do the adults feed just once a day, or twice a day? Is there any pattern?

Clive. I don't know. I think this is the part where we got the least good data on. When they are not breeding, of course, they are like all other waders and are feeding for most of the day and for the great majority of the night. Here, I think - well, we really don't know if there was a good sharing of the incubation or whether it was predominantly done by one bird, because we found a relatively small number of actual change overs taking place which suggested there were very long incubation periods by one bird or in most cases only one bird was doing the incubation. I watched sixty birds in one afternoon [ie returning to the nest] and only four of those came to a change over and the other fifty six had left their nest and gone out for a quick feed or drink and had come back to their nest without there being any change over. When I followed change overs in the morning I think that after fourteen had taken place [birds leaving the nest] something like ten were change overs. I've got the figures down, those are approximate figures. In the early morning there were clearly fewer change overs taking place because there wasn't such a temperature pressure, sorry, I mean there were a lot fewer departures from the nest at all.

Jeremy. When they feed are they just picking at the shrimp?

Clive. Yes, either from off the surface or very near the surface. As you can see they put their head right under water. I think that they are picking a specific item that they have seen and my guess is that almost every peck is producing some food, but it's happening so quickly that you can't really see the swallow, when others are sweeping from side to side you almost always see it swallow. The next time we get onto feeding lets try and watch very very slowly, let's just watch. Can we see if it consciously swallows - yes, you saw it swallow there, it got one there, but it failed there wouldn't you think? Perfect, fine, so it's exactly like the Avocet, you can see it swallow and nearly every time it's successful.

This is now roff thirteen.

Mark. These are the first chicks we saw in the colony.

Clive. Look at the way it's fighting. I love the way it is keeping all the others at bay. Now why is it doing that? Is it too damned hot?

Mark. It's got a sore leg.

Mark. They seemed to have an inordinate amount of trouble getting their legs out of the egg.

Clive. Yes, they have huge feet.

Mark. It seemed that once they were all folded up inside the egg their feet are somehow tucked underneath, they got their heads out all right but have trouble with their feet.

Clive. You've got some lovely hatching sequences here. You see quite a few birds have those flecks of white on their breast but it didn't mean that they were female or male and on the ones that were like that and were collected, they were not growing any feathers so there was no progressive moult going on to get rid of those last few white feathers.

Now we are onto footage from the second shoot.

Clive. Now what is the very small stuff behind?

Mark. There were some very small bi-valves with the brine shrimp.

Clive. And that's what you thought the chicks were feeding on?

Mark. Yes.

Clive. When they go into the shallow water?

Mark. Yes.

Now footage of chicks up to the north and west of the colony.

Clive. Now, you're not with the colony are you?

Mark. No, this is right up towards the other end of the lake.

Clive. Good grief, is that Stilts in the background?

Mark. That's all Stilts, everything you can see is Stilts.

Clive. Now, which are those young birds?

Mark. You can see in the foreground are young birds with one adult, no, two adults feeding with them, no three adults in that group.

Clive. Now these are half grown young, and they are walking not swimming. What you were telling me?

Mark. Yes. These are some of the larger ones.

Clive. OK. They're still very white aren't they?

Mark. Yes. Now there is an adult and three young.

Clive. They are really feeding in walking depth water and not swimming. Now this is where you're moored in a boat and the birds are coming up to you.

Mark. I'm sitting in the ARGO in about two or three inches of water.

Clive. Now, I'm trying to see if I can relate any adult to any particular chicks, and it's not very obvious from watching this whose with who.

Mark. It was totally unobvious when we were there too.

Clive. There seems to be no attachment. And as you were saying the proportion of chicks to adults seems to be much greater than when they were leaving the colony.

Mark. There was this sort of loose clustering that was happening all over the water.

Clive. In the background there it is the same as in the foreground? With the majority being chicks?

Mark. It is the same clustering into groups.

Clive. Is that a chick in the middle?

Mark. Yes, that's a chick.

Clive. It appears to have no relationship to any of the others.

Mark. It happened in three groups, the little fluffies, then the ones with a bit of grey breaking through and then the other ones with quite a bit of grey breaking through on the wing.

Clive. [reacting to shot of chick feeding] You can almost see it swallowing like an adult. But they are choosing to walk albeit right up to the top of their legs.

Mark. And they'd walk daily from the west and walk around through to the deeper water around there, and then back and that was their day's activity.

Clive. He's definitely walking, that's really just like an adult now, isn't it? in the way it's feeding and the way it's walking.

Jeremy. Would you expect them to swim?

Clive. Yes. You see as soon as they leave the colony they are swimming as they feed. I've never seen a chick walk yet until this film, I've only seen them swimming.

Mark. This was all we could find.

Jeremy. Now how old would that chick be?

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Clive. That one looks about ten days old to me, and that one about a fortnight. I don't know, maybe they grow more slowly than the ones I have seen. So all that in the back, it's not adults but the same type of grouping?

Mark. Yes, it's the same as far as we could possibly see.

Clive. Did you ever see a bird brood any chicks at that stage?

Mark. No, not in water, no.

Jeremy. At night time did they stay in the water?

Mark. I don't know, they were there when it was dark and they were there at first light. By moonlight there were birds out there but I couldn't tell if they were chicks or adults, but there were birds out there feeding.

Clive. It almost looks as if they are walking at random, as if they are not part of any group.

Mark. They were in loose associations that would cover the area of this room [David's film editing room]. Then you might have ten metres of clear water and there would be another loose association. Then they would bump into each other, sort of meet and mingle and then depart, they would intermix and then depart again in two groups.

Clive. There's just one adult and about twenty young all together.

Mark. There's a cat walking down the dune, and somewhere here the chicks realise and panic, they go straight out into deeper water.

Clive. It's fascinating to see them still very white, but getting up to a third and a half grown.

Mark. The background is that when we started the wind in the morning was blowing from the south and the water was quite deep and then it swung around from the north and pushed the water off shore, and in the matter of a few minutes the water level would start to drop and expose these mud flats.

Clive. And that again is 90% chicks over there, is it?

Mark. Yes.

Clive. Good god, just look at it - look at that. Phenomenal, and that's some adults. Now, why have we suddenly come across a group that is 100% adults. Are you at a different location?

Mark. No. But if you come into them from the north, they are off to the east and the chicks are off to the west, if you go east you would find adults and if you go west you would find chicks.

Clive. They are right up to where the water and the mud meet. Now that looks like five chicks or so following an adult.

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Mark. That's their panic move, when they were alarmed. they would still feed, but all march in the same direction.

Jeremy. Will those chicks stay at that lake for as long as conditions are right?

Clive. Well, no one really knows. We've got people watching for when numbers of birds start to reappear around Perth and Albany and if they've got leg tags on them and if any are obviously juvenile by plumage. I would think in most cases they would leave the lake pretty promptly, but in this year because of the timing and the water situation they've probably stayed much longer than normal. How deep would that mud be, about ankle?

Mark. No, about waist deep.

Clive. You can't walk on that?

Mark. stuck. No. When the water goes away and the ARGO is sitting on it, you're

Clive. There is no doubt that extensive crèching, in the sense that they have got into a large amorphous mass with few adults, has taken place by now.

[long pause]

Clive. So it would be about one adult to ten chicks.

Mark. chicks. That would be pretty right, about one adult to between ten or twelve

Clive. And they came up right by the boat to feed?

Mark. Yes, and it was when they were a little bigger than that when they were starting to try and fly.

Clive. I would guess that those chicks are about four weeks old.

Mark. Now that would also sometimes happen, a single adult would fly in and start feeding.

Clive. And it wouldn't seem to have much ownership of anything?

Mark. That's right.

Clive. We'd be fascinated to know what they did do at night.
- [long pause] - There are some examples of where more than one bird has gone down to the water and although one bird has tried to keep the other bird away the chicks are obviously attached to one bird, and I wonder if that is it's mate and that is the moment of separation, it's saying "go on, you bugger off and get fat and get ready to relay and I'm looking after the chicks".

END OF TAPE

**Letter (03/3/1996) from Jeremy Hogarth to JL seeking JL's comments on an attached 'early draft' [18/10/1995] script of 'Bobby and the Banded Stilts'.
Extracted [by JL on 02/4/2014] pages of script refer to: *Parartemia* eggs in the dry salt; no rivers; high nutrients; fish; lake bathymetry and hydrology; water temperature and food; food for BaSt; Brine shrimp abundance and breeding several times; BaSt feeding techniques (pecking); small eyes of BaSt; feeding by day-old chicks; dispersal and feeding; feeding depths; lake drying, salinity rising, brine shrimp mating, types of eggs, 'resting egg'.**

125.

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**NATURAL
HISTORY**



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"direct"

March 3rd, 1996

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AUSTRALIA

Dear Jim,

Thanks for your fax - here is the script on Stilts. Essentially it is the same script that I gave to Clive, but it has incorporated some of the changes that he suggested. As I have said before, it is very much an early draft at the moment.

I'll look forward to your comments when you have the chance to read it.

Best wishes for now,

Jeremy Hogarth

206 83
94

BOBBY AND THE BANDED STILT

**Jeremy Hogarth
ABC Natural History Unit ©
18/10/95 [11:19]**

SERIES OPENING TITLE
"WILD RELATIONS"
MIX THROUGH TO:

1. PROLOGUE

1. BCU'S GRAINS OF SAND BLOWN FROM DUNE CREST;

SOUND FX

the arid interior of

2. WS'S DESERT & SALT LAKES;

In ~~Central~~ Australia great lakes of salt shimmer in the heat of the day. The first European explorers thought that there must be a vast inland sea, but for years on end these salt lakes lie empty and desolate ~~a thousand~~ and more kilometres from the coast.

five hundred /

3. BCU'S SALT GRAINS BLOWING FROM LAKE BED;

Under the dry salt lie minuscule eggs. Minute time capsules waiting for their one chance of life - waiting for the rain.

4. WAVES BREAKING; CU'S STILTS ON SHORE LINE;

Along the southern ^{and western} coast, large flocks of waterbirds feed in the estuaries and ~~tidal~~ ^{coastal lakes} creeks. These are Banded Stilts which ~~only~~ only breed in the salt lakes of the inland when they fill with rain. Like the eggs in the dry salt ~~one thousand kilometres~~ away these birds have also been waiting for years.

five hundred or more kms /

5. TIME LAPSE CLOUDS OVER OCEAN;

Early in February 1995 a cyclone began to build in the Timor Sea. It grew in intensity and was given the name Bobby.

This is the story of when Bobby brought rain to one salt lake ~~in the desert.~~ *of the interior*

(or "in the arid outback")

- super title -

BOBBY AND THE BANDED STILT

ARID INTERIOR

4. ARCHIVAL - RAIN IN DESERT, REACTIONS

1. RAIN CLOUDS BUILD UP; SOUND FX

2. RAIN IN ~~DESERT~~; When the rain is heavy and widespread over the catchment and run off areas the salt lakes and clay pans are ~~often the last~~ quick to fill.

3. LIZARD DRINKING; BOB-TAIL LIZARD IN FLOODS; The rains herald relief after long years of drought. For some it is the first time there has been an abundance of drinking water in their whole life, but for others the flash floods bring danger.

4. PLANIGALE EMERGES FROM FLOODED CRACK; The Planigale, the smallest marsupial in the world, is forced out of the cracks in the earth which are its home. This tiny animal weighs just 5 grams, and now exposed and shivering from the sudden cold this Planigale is unlikely to survive.

5. LAKE EYRE IN FLOOD; In some instances the rain may fall hundreds of kilometres away from the salt lakes. But with enough rain the rivers will flow and ~~and~~ ~~again~~ weeks, sometimes even months later, this water will empty into the great salt lakes. ~~may~~ a vast

6. PELICANS ETC BREEDING; And as if from nowhere the birds arrive from the coast ~~sometimes~~ perhaps a thousand ~~or~~ kilometres away.

Ducks, Terns, Cormorants, Swans, Gulls and Pelicans all flock to these ephemeral lakes, all are opportunistic nomads, moving to wherever there is sufficient water to breed, for when these inland salt lakes and clay pans flood the water is extremely high in nutrients for the nesting birds.

How the birds know where there will be water is ~~still~~ unknown, but as a suitable lake or swamp ~~is~~ fill the birds arrive and immediately commence their courting and breeding. And they ~~will~~ continue to breed for as long as the conditions are suitable.

OK for Eyre, but Ballard, Baskin + Marmion fill from local rain fall.



to/

may



7. CHICKS DYING

Lake Frome, Lake Gregory or Lake Eyre in ^{fall} flood are among the great sights of the natural world, but ~~it~~ ^{this} occurs infrequently. And the conditions ~~can~~ ^{do not} remain like this for long. Finally as the lake ^{starts to} dry and ~~the~~ ^{salinity} increases those birds that can depart. Those that haven't grown large enough or ~~are~~ ^{too young} too weak to fly will die.

do/



Looks incomplete without suggested explanation for why this is so.
Does Clive have a suggestion? —

[Lake Eyre has flooded perhaps only four times this century, but even when it does flood there are no Banded Stilts among the hundreds of thousands of birds that nest there.

INCORRECT

maybe fish v. Paramecia?

5. STILTS ALONG SHORE LINE

1. STILTS ON SHORE LINE;

Banded Stilts need very specific conditions and are only able to breed in very few of the salt lakes.

and nutrient rich.

The water must be shallow, ~~also~~ warm. The food supply must be so abundant that the chicks can feed themselves immediately they hatch, for like all waders the adults ~~never~~ feed their young. The lake must also have low islands where the birds can scrape their nests and give the chicks easy access to the water.

Soon after hatching / do not / ~~feed~~ predator free /

in the sand

2. WS'S SALT LAKE;

Stilts have been recorded breeding in two lakes in South Australia, and those two breeding events were fifty eight years apart.

In West Australia there are more records of nesting, and most of these from three lakes to the north of the gold mining town of Kalgoorlie.



Much of the water filling the lake was direct precipitation i.e. the 0.38 m of rain that fell.

8. LAKE BALLARD, FIRST REACTIONS

actually pastoral land, also sheet flow of surrounding land

1. CREEKS FLOODING; The rain from Bobby was widespread over a huge area. From the surrounding desert water coursed down small creeks that had been dry for years, flowing into the new lakes.

2. MACRO, SHRIMP EGGS REACT; Among the first to react were the brine shrimp *Parartemia*. The dried eggs were soaked and the life inside them released from suspended animation.

3. FIRST BRINE SHRIMP; The shrimp grow rapidly in the warm and shallow saline water and their life cycle starts once again. Within days the waters of Lake Ballard were teeming with millions of these tiny brine shrimp. These lakes are a virtual paradise for *Parartemia* for they are not fed by rivers but instead by local run-off, so there are no fish in Lake Ballard, virtually nothing predates upon the shrimp - but Banded Stilts do.

4. STILTS TAKING OFF FROM SHORE; And the Stilts reacted in their tens of thousands

5. AERIAL - FLOODED LAKE BALLARD; Out of the three lakes that flooded because of Cyclone Bobby the Stilts chose one - Lake Ballard.

The Stilts nested on all three lakes, Ballard had the greatest numbers, followed by Morrison, then Barlee. in numbers.



9. LAKE BALLARD, STILT COLONY

1. STILTS ARRIVE;

It is not known when the first of the Stilts arrived at Lake Ballard, perhaps some had flown in from the coast even before the rains had ceased, possibly arriving sometime before February 28th. However, it seems certain that the first eggs of the colony were laid by March 8th.

By March 12th, just sixteen days after the rain had started, over five thousand birds were on one small island, over two thousand nests had already been scraped out of the sand. Within three more days the colony had more than doubled to almost five thousand nests.

This one colony was eventually to grow to over twenty thousand nests, with another fifteen thousand on another island just four kilometres to the west.

Finally over seventy thousand birds were on just two small islands in Lake Ballard - ~~almost half~~ ^{near} of the entire Banded Stilt population in Australia.

Banded Stilts are not the only wader to nest ~~in~~ ^{near} the centre of ~~an~~ arid continent, Red-necked Avocets, Red-capped Plovers and Inland Dotterels also use the ephemeral waters of ~~Central~~ ^{near} Australia. But the Banded Stilt is the only wader to nest in vast communal flocks. They ~~need~~ ^{require} a hyper saline habitat, ~~where~~ ^{where} other waterbirds can not. In this again they are similar to the African Flamingo, indeed Banded Stilts have been called the flamingos of the instant sea.

perhaps 10-20%

feed and breed in this arid

See 2.5, 2nd para



(the largest of the three)

2. FIRST COPULATIONS & NEST BUILDING;

The first days of the Lake Ballard colony were days of frantic activity. Everywhere there were attempted copulations, while those birds which had already paired were scraping out their shallow nests. Aggression associated with finding mates and nest sites was common and widespread.

The birds had reacted so quickly that for many of them there was no time to grow full breeding plumage. Almost one third of the adults had not fully developed the conspicuous chest band which gives the species ~~the~~ its name. Another ten percent lacked breeding plumage altogether.

In many species a female bird will not react to a male unless he is in breeding plumage. Yet here Banded Stilts without any breeding plumage at all were selecting mates and later incubating eggs - another riddle for the scientists.

favourably

3. BIRDS INCUBATING EGGS;

The breeding cycle of the Stilt is very short for a bird of this size. It has to be. Quick and efficient breeding is a necessity for a species that nests on lakes that suddenly appear, then may ~~quickly~~ dry up again. In 1980 on Lake Barlee, just over one hundred kilometres from Lake Ballard, hundreds of thousands of deserted eggs were found. The birds had arrived, and laid, and then just as quickly deserted when conditions ~~changed~~, and no one knew until weeks later.

a few within months

became adverse

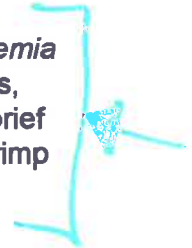
and infrequently

But for the moment at Lake Ballard the conditions are stable.

The female lays one egg each day until the clutch of four or five is complete. The chicks will start to hatch three weeks later.

4. BRINE SHRIMP;

Quick and efficient breeding is essential for *Parartemia* too. Each female can carry over one hundred eggs, and she will be able to breed several times in her brief life. They multiply rapidly and by now the brine shrimp are in countless millions.





5. ADULTS FEEDING;

It is thought that the Banded Stilt pairs take turns at incubating the clutch of eggs, allowing each adult a chance to feed during the day.



Banded Stilts feed by picking at individual shrimp, using their long bills with precision. Here again the bird is different from others, for birds which feed in this way normally have large eyes. But the Stilt's eyes are small, perhaps an adaptation to counter the glare from the water that they spend their entire lives feeding from.

source?
source?

6. FIRST CHICKS HATCH;

On April 3rd the first chicks hatched, a mere 35 days after the rains from Cyclone Bobby had ceased. They wait with their parent until the rest of the clutch hatch, then they are taken down to the lake never to return to the nest again.

7. CHICKS TAKEN TO WATER;

As the first chicks begin to totter on unsteady legs down towards the water they must pass through the small territorial space of other incubating adults. This transgression was met with continuous and unabated hostility. The chicks were pecked at, often by three adults at a time, as they were shepherded through the colony, their parent occasionally trying to shield them by stopping and ~~letting them take shelter~~ under the wing.

prodding

with partly opened wings.

But when the chicks arrived at the open stretch of sand between the colony and the water's edge something extraordinary happened.

By now they were out of any occupied territory, yet the attacks continued. Adult birds continued to peck at them, and to trample them underfoot. Sometimes the birds at the shoreline were so aggressive they even attempted to copulate with the escorting parent which is more often than not thought to be the father.

~~The~~ ^{Some} attacks continued even into deeper water when the chicks were starting to form into the crèches.



8. CHICKS FEEDING;

But all the while more and more chicks were walking down to the water's edge, sometimes as many as two thousand in a day, and a day or two after hatching commenced, the attacks ceased.

I don't recall this.

one of the reasons /

The day old chicks immediately begin to feed themselves from the shallow water. They must be hatched into an environment where food is readily available and in vast numbers, which is why the brine shrimp are of such vital significance in the Banded Stilts' life, and why Lake Ballard ~~is~~^{is} one of ~~the~~^{the} few places where it is possible for these birds to breed.

9. CHICKS IN CRÊCHES WITH ADULTS;

Once in deeper water the chicks form into larger crêches, sometimes numbering as many as two hundred. Some adults ~~will always~~^{will always} remain with the chicks to protect them against predators. Once again these birds are thought to be the males, ~~adults will~~^{adults will} protect chicks which are not theirs, perhaps an attempt at a form of co-operative breeding.

usually 20-50 but and presumably enhance their chances of survival.

this frees the females for subsequent re-nesting?

But on Lake Ballard the guard was unnecessary for virtually nothing came to predate upon the tens of thousands of chicks that were now spreading over the lake. Ballard is so remote and fills so seldom that nothing else can take the long term risk of breeding here.

~~nothing else can take the long term risk of breeding here.~~

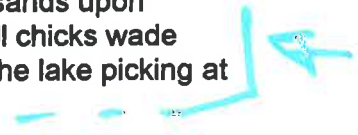
10. AERIALS LAKE BALLARD;

The crêches of chicks with their ~~protective~~^{accompanying} adults vanished into the vastness of Lake Ballard, blown by the prevailing winds, all the while feeding upon the shrimp.

The comments about "protection" are in conflict with the last sentence of 2.5, which says "they make no attempt to defend their chicks from predators."

11. OLDER CHICKS IN CRÊCHES;

By the end of April 1995 the prevailing winds were blowing towards the west, and this was where the chicks were finally found, well over fifty kilometres from the island. By now there were thousands upon thousands of them. Large and small chicks wade among the shallows at the edge of the lake picking at the shrimp.



The Lake Ballard hatching had been a particularly good year for the Banded Stilt.

too soon/

On several other breeding occasions the water has dried up and the chicks have been abandoned to a certain death.



Silver Gulls / few/

In 1988 there was a large Banded Stilt breeding colony on lake Torrens in South Australia, but thousands of chicks were lost to predatory ~~seagulls~~ ^{seagulls}. But at Lake Ballard there were ~~virtually no~~ ^{virtually no} predators and the water level remained high. The chicks and many of the adults will remain here for as long as the water and the brine shrimp remain. Then they will take to the wing and fly towards the distant coast.



12. DESERTED COLONY;

deserted/

Just over two months after Bobby filled the lake, the island colony ~~was~~ ^{is} deserted. All that was left were thousands upon thousand of ~~empty~~ ^{empty} nest scrapes, and the detritus of a once thriving community of thousands of birds.

What is left is food for the maggots.

13. BRINE SHRIMP;

And eventually the water will vanish.



But before then there is another remarkable occurrence in the story of the Banded Stilt and the shrimp.

reverse the sequence

As the lake water evaporates, the salinity ~~starts to rise~~ ^{begins to rise} eventually to many times the level of sea water. When it becomes too saline the birds will desert, and the brine shrimp start to die. But before that point is reached the female brine shrimp senses the rising salinity. As it approaches 250 grams of salt per litre of water she begins to grow a different type of egg, a resting egg. These remain in her egg sac as she dies and sinks to the bottom. Her life is ended, but the ³²eggs remain and endure the long years of drought and heat until once again rain brings them back to life.

Unlike the earlier eggs she has layed of

special 'different' to us to



10. EPILOGUE

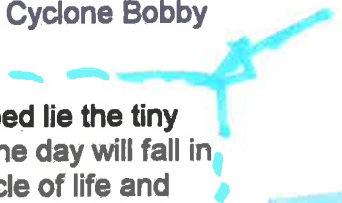
ARED INTEREST
1. ~~DESERT~~ SHOTS;

But when that rain will return is ~~always~~ uncertain, where it will fall is never predictable. The ~~desert~~ *dries out* ~~outback~~ *dries* once again, the water is gone from the lake. The Banded Stilts, too, are long gone from the shores of Lake Ballard. The rain and the life that Cyclone Bobby brought were but a passing moment.

2. CU'S SALT BLOWN IN WIND;

And in the wind blown salt of the lake bed lie the tiny eggs waiting, waiting for the rain that one day will fall in Lake Ballard to once again start the cycle of life and death.

ROLL CREDITS



Fax (27/2/1996) from Jeremy Hogarth to JL in which he states: 'Also he (Mark Lambly) has been doing some macro filming of Brine Shrimp ...'

**TVNZ NATURAL HISTORY**

Television New Zealand Ltd
P.O. Box 474 Dunedin New Zealand Phone 03 479 9799
Facsimile 03 479 9917

PLEASE DELIVER THE FOLLOWING PAGE(S)

TO: JIM LANE
LOCATION: C.A.L.M.
FAX NO: +61-97-521 432
FROM: JEREMY HOGARTH
DATE: 02/27/96 15:41 (New Zealand Summer Time)

PAGE 1 OF 2

Dear Jim,

I'm not sure if I told you that I was moving across to Natural History in New Zealand, or if word had filtered through from Clive - or perhaps no word had got through at all. However, here I am!

But I have not left STILTS totally behind in Australia.

We did some more filming last year when a large group of Banded Stilts had gathered around some salt lakes near Horsham in western Victoria. Mark Lambie has just come back from doing some establishing shots in dry salt lakes and sand dunes etc. Also he has been doing some macro filming of Brine Shrimp, and before I left I had arranged to get some computer simulation of Cyclone Bobby from the Met Bureau in Melbourne as well as what little news footage there was from ABC News.

The outline has not changed from the draft that I sent you last year, and in my absence Clive will be constantly informed as to progress, as well as looking at the rough cut, looking at the draft scripts etc. And indeed the rough cut as well as the draft will be sent out to you.

I am arranging for the rough cut to be sent out to me here as well, as I do not intend to lose sight of the film, even if it has to be from a distance.

In the meantime I'd be interested to hear any feed back that you might have from the first draft treatment that I sent last year. As I said to you any comments that you have will be welcomed, and in some respects the earlier the better as it will give the editor in Melbourne more time to make any structural changes that you feel may be necessary.

The move to New Zealand began mid way through last year, but nothing was definite until just before Christmas. The Unit here is very active and considerably bigger than the ABC Unit, although I do miss Australia greatly and certainly the odd chance to get out into the desert.

10
ds

I got a chance a couple of weeks ago to fly in a helicopter down to the Fiordland national Park at the Western end of South Island, and it was quite spectacular country. I've seen nothing like it in Australia, but Australia has a very different type of spectacle.

I feel that the Stilts film is going to turn out as an excellent study of the reaction of that group to the one event of Bobby, and I am certainly looking forward to seeing the final result.

In the meantime if you have any immediate questions either contact Clive in Melbourne, or the film editor in Melbourne. He is David Luffman, and can be contacted either by fax on 03-9524 2373 or by phone via the Natural History Unit on 03-9524-2341.

I hope you had a good break over Christmas, and that all your research and so on is going well. Please pass on my regards to Grant.

I will get back in touch once the rough cut has found its way out to you in the west and to me on the other side of the Tasman. I don't have much idea of when that may be, but I have asked for some indication, and will let you know when I know myself.

With best wishes for now,


Jeremy Hogarth
Executive Producer

‘Copy [12/2/1996] of Report on 120 samples of water received on 20 [Sept] 1995; 2 samples of water received on 21 [Sept] 1995; 1 sample of water received on 28 [Sept] 1995’. This was faxed by WA Chem Centre to GBP on the same date (12/2/1996). An annotation by WACC reads: ‘original issued 30/11/95, reissued 12/2/96’.

Four (only) of these samples were from Lake Ballard (2) and Crossover Lake (2). Results are presented for Tot P & Tot N (only). Annotations by JL suggest these four samples were collected on 14/9/1995. JL has also annotated the report with some water depth measurements, salinities, conductivities and pH values and refers to a water level logger.



CHEMISTRY CENTRE

Your Ref: /
Our Ref: **95E0407; 3.1.9**
Enquiries to
Telephone:

Research Centre Manager
Department of Conservation and Land Management
Woodvale Research Centre
Ocean Reef Road
WOODVALE WA 6065
Attention: **G Pearson**



Copy of Report on:

- 120 samples of water received on 20 September 1995**
- 2 samples of water received on 21 September 1995**
- 1 sample of water received on 28 September 1995**

- 95E0407/001 Wilson
- 95E0407/002 Wilson
- 95E0407/003 Jasper
- 95E0407/004 Jasper
- 95E0407/005 Maringup
- 95E0407/006 Maringup
- 95E0407/007 Corrigin
- 95E0407/008 Corrigin
- 95E0407/009 Nine Mile
- 95E0407/010 Nine Mile
- 95E0407/011 Egret
- 95E0407/012 Egret
- 95E0407/013 Clifton
- 95E0407/014 Clifton
- 95E0407/015 Forrestdale
- 95E0407/016 Forrestdale
- 95E0407/017 Gibb Road
- 95E0407/018 Gibb Road
- 95E0407/019 Thompsons
- 95E0407/020 Thompsons
- 95E0407/021 Harvey
- 95E0407/022 Harvey
- 95E0407/023 Yealering
- 95E0407/024 Yealering
- 95E0407/025 Unicup
- 95E0407/026 Unicup
- 95E0407/027 Byenup
- 95E0407/028 Byenup
- 95E0407/029 Boat Harbour Lake
- 95E0407/030 Boat Harbour Lake
- 95E0407/031 Tordit-Garrup
- 95E0407/032 Tordit-Garrup
- 95E0407/033 Muir
- 95E0407/034 Muir

*See Ballard
+ compare data and dates
on next
pages*

[Signature]
31/7/97

95E0407
12 February 1998

Chemistry Centre (WA)

125 Hay Street, East Perth, Western Australia 6004 Phone (09) 222 3177, Facsimile (09) 325 7767

**CHEMISTRY CENTRE (WESTERN AUSTRALIA)
ENVIRONMENTAL CHEMISTRY LABORATORY**

REPORT OF EXAMINATION

- 95E0407/091 Gore
- 95E0407/092 Gore
- 95E0407/093 Culham
- 95E0407/094 Warrinup
- 95E0407/095 Warrinup
- 95E0407/096 Kwornicup
- 95E0407/097 Kwornicup
- 95E0407/098 Chandala
- 95E0407/099 Chandala
- 95E0407/100 Cross Over
- 95E0407/101 Cross Over
- 95E0407/102 Ballard
- 95E0407/103 Ballard
- 95E0407/104 Guraga
- 95E0407/105 Guraga
- 95E0407/106 Bambun
- 95E0407/107 Bambun
- 95E0407/108 Eganu
- 95E0407/109 Eganu
- 95E0407/110 Wannamal
- 95E0407/111 Wannamal
- 95E0407/112 Crackers
- 95E0407/113 Crackers
- 95E0407/114 Davies
- 95E0407/115 Davies
- 95E0407/116 Broadwater
- 95E0407/117 Broadwater
- 95E0407/118 Jandabup
- 95E0407/119 Jandabup
- 95E0407/120 Joondalup
- 95E0407/121 Joondalup
- 95E0407/122 Taarblin
- 95E0407/123 Taarblin
- 95E0407/124 Toolibiri

318 mm exposed
250 ppm
9:30 am
(455 us)
pH 7.10
on 14/9/95
probably 14/9/95
Assume from Sep Run by GBP
31.5 cm deep at the logger
at -- probably 20 cm
Duct at Jandabup
67.8 ppt (101 ms)
pH 7.05

**Analyte
Unit**

**N_{total} P_{total}
mg/L mg/L**

CCWA ID	Client ID	Sampled	N _{total} mg/L	P _{total} mg/L
95E0407/001	1/unfilt.	11/09/95	0.62	0.01
95E0407/002	1/filt.	11/09/95	0.72	<0.01
95E0407/003	2/unfilt.	11/09/95	0.92	0.01
95E0407/004	2/filt.	11/09/95	1.1	<0.01
95E0407/005	3/unfilt.	11/09/95	0.93	<0.01
95E0407/006	3/filt.	11/09/95	1.0	<0.01
95E0407/007	4/unfilt.	11/09/95	2.6	0.36
95E0407/008	4/filt.	11/09/95	3.2	0.23
95E0407/009	5/unfilt.	11/09/95	0.69	0.02
95E0407/010	5/filt.	11/09/95	0.82	0.01
95E0407/011	6/unfilt.	11/09/95	6.4	1.4
95E0407/012	6/filt.	11/09/95	6.7	1.2
95E0407/013	7/unfilt.	11/09/95	3.4	0.03
95E0407/014	7/filt.	11/09/95	3.5	0.01
95E0407/015	8/unfilt.	11/09/95	2.5	0.04

95E0407
12 February 1996

84.

**CHEMISTRY CENTRE (WESTERN AUSTRALIA)
ENVIRONMENTAL CHEMISTRY LABORATORY**

REPORT OF EXAMINATION

Analyte Unit			N _{total} mg/L	P _{total} mg/L
CCWA ID	Client ID	Sampled		
95E0407/068	34/filt.	13/09/95	5.9	0.02
95E0407/069	35/unfilt.	13/09/95	1.4	0.01
95E0407/070	35/filt.	13/09/95	1.6	0.01
95E0407/071	36/unfilt.	13/09/95	6.3	0.05
95E0407/072	36/filt.	13/09/95	6.1	0.04
95E0407/073	37/unfilt.	13/09/95	2.1	0.24
95E0407/074	37/filt.	13/09/95	2.0	0.10
95E0407/075	38/unfilt.	13/09/95	0.97	0.02
95E0407/076	38/filt.	13/09/95	0.98	0.02
95E0407/077	39/unfilt.	13/09/95	1.4	0.04
95E0407/078	39/filt.	13/09/95	1.3	0.01
95E0407/079	40/unfilt.	13/09/95	1.4	<0.01
95E0407/080	40/filt.	13/09/95	1.5	<0.01
95E0407/081	41/unfilt.	13/09/95	1.4	0.01
95E0407/082	41/filt.	13/09/95	1.5	0.02
95E0407/083	42/unfilt.	13/09/95	4.0	0.11
95E0407/084	42/filt.	13/09/95	1.8	0.02
95E0407/085	43/unfilt.	13/09/95	3.8	0.09
95E0407/086	43/filt.	13/09/95	4.0	0.14
95E0407/087	44/unfilt.	13/09/95	8.2	0.07
95E0407/088	44/filt.	13/09/95	7.6	0.03
95E0407/089	45/unfilt.	13/09/95	2.6	0.28
95E0407/090	45/filt.	13/09/95	2.5	0.26
95E0407/091	46/filt.	13/09/95	2.9	0.03
95E0407/092	46/unfilt.	14/09/95	3.8	0.13
95E0407/093	47/filt.	14/09/95	0.28	0.04
95E0407/094	48/unfilt.	14/09/95	2.1	0.04
95E0407/095	48/filt.	14/09/95	2.0	0.01
95E0407/096	49/unfilt.	14/09/95	2.8	0.02
95E0407/097	49/filt.	14/09/95	3.8	0.01
95E0407/098	50/unfilt.	14/09/95	1.8	0.39
95E0407/099	50/filt.	14/09/95	1.8	0.41
95E0407/100	51/unfilt.	14/09/95	0.72	0.03
95E0407/101	51/filt.	14/09/95	0.80	0.01
95E0407/102	52/unfilt.	14/09/95	1.2	0.03
95E0407/103	52/filt.	14/09/95	1.1	0.01
95E0407/104	53/unfilt.	14/09/95	3.0	0.30
95E0407/105	53/filt.	14/09/95	3.0	0.23
95E0407/106	54/unfilt.	14/09/95	2.2	0.90
95E0407/107	54/filt.	14/09/95	1.7	0.84
95E0407/108	55/unfilt.	14/09/95	1.0	0.03
95E0407/109	55/filt.	14/09/95	1.3	0.01
95E0407/110	28/unfilt.	14/09/95	1.0	0.01
95E0407/111	56/filt.	14/09/95	1.1	0.01
95E0407/112	57/unfilt.	15/09/95	2.4	0.10
95E0407/113	57/filt.	15/09/95	2.0	0.07
95E0407/114	58/unfilt.	15/09/95	1.8	0.04
95E0407/115	58/filt.	15/09/95	1.8	<0.01
95E0407/116	59/unfilt.	15/09/95	1.5	0.06
95E0407/117	59/filt.	15/09/95	1.5	0.05
95E0407/118	60/unfilt.	15/09/95	1.6	0.03

- Coarser
 - Coarser
 - Better
 - Better

14/9/95

REPORT OF EXAMINATION

Analyte Unit			N_total mg/L	P_total mg/L
CCWA ID	Client ID	Sampled		
95E0407/119	60/filt.	15/09/95	1.5	0.02
95E0407/120	61/unfilt.	15/09/95	1.3	0.02
95E0407/121	61/filt.	15/09/95	1.3	0.01
95E0407/122	62/unfilt.	12/09/95	4.4	0.09
95E0407/123	62/filt.	12/09/95	3.7	0.02
95E0407/124	27/unfilt.	12/09/95	8.9	0.11

Analyte	Method	Description
N_total	INP1WTAA	Nitrogen, persulphate total.
P_total	IPP1WTCO	Phosphorus, persulphate total.

These results apply only to the sample(s) as received.


In a number of the samples the total nitrogen in the filtered sample is higher than in the unfiltered sample. Similarly two samples have total phosphorus values higher in the filtered sample than in the unfiltered. These results have been confirmed by repeat analysis. The anomalies may be due to contamination from the filter papers used.

Jenny McGuire
 Acting Principal Chemist

Roger Schulz
 Principal Chemist

ENVIRONMENTAL CHEMISTRY LABORATORY

12 February 1996

original issued 30/11/95
re issued 12/2/96


Fax (30/1/1996) from ACI to JL (copied to GBP for info) saying: 'I have documented the Lake Ballard gut contents and sweep samples [and Crossover Lake sweep samples]. Are they clear enough? Should I ... do the same for [Lake] Marmion samples? Do you want me to discuss sorting techniques with Andrew Storey or others?' Attached are tabulations (in MSWord) detailing all the sweep and gut samples collected at Lake Ballard (only) in 1995. These are the same or similar to the Tables used on 22/7/1997 and in 2005 (see above for both). Note that some sweeps were associated with gut sampling (of collected BaSt) and some were not. This RMCR is primarily about the sweeps that were not. The 'BaSt adults & chicks collected in 1995 RMCR' is primarily about the sweeps that were.

CONSERVATION AND LAND MANAGEMENT
SCIENCE & INFORMATION DIVISION
WILDLIFE RESEARCH CENTRE, WOODVALE
FAX NO (09) 306 1641 TELEPHONE NO (09) 405 5100



96.

Date: 30/1/96

To: SIM LANE

At: BUSSELTON

From: ALAN C.

No of Pages: 3
(including face sheet)

Message: I have documented the Dale Ballard ~~on~~ ^{cut} contents and mass samples are they clear enough? should I proceed to do the same for Marmion samples? Do you want me to discuss coating techniques with Andrew Storey or others?



95.

LAKE BALLARD 1995
 INVERTEBRATE SWEEPS AT CAMP ISLAND AND CROSSOVER LAKE

Date	Site	Sweep No.	Vials	Comments
15/03/95	Camp Island	1	1	250um net was used
01/04/95	Camp Island	1	1	110um net was used
		2	1	
		3	1	
01/04/95	Crossover Lake	1	1	It seems 2 lots of samples were taken for this date. check GP's notes
		2	1	
		3	1	
		1	3	
09/04/95	Camp Island	1	1	
		2	1	
		3	1	
11/04/95		1	1	
		2	1	
		3	1	
28/04/95		1	2	
		2	2	
		3	2	
04/05/95		1	2	
		2	1	2nd vial damaged
		3	2	
09/06/95		1	2	
		2	2	
		3	2	
09/06/95	Crossover lake	1	4	

4e1

LAKE BALLARD 1995
BANDED STILT GUT CONTENTS AND SWEEP SAMPLES

Date	Site	Bird	Contents	Vials	Sweep	Vials	Comments
02/04/95		adult 1	gizz	1			
		adult 2	gizz	1			
		adult 3	gizz	1			
		adult 4	gizz	1			
		adult 5	gizz	1			
		adult 6	gizz/oes	1			
		adult 7	gizz/oes	1			
		adult 8	gizz/oes	1			
		adult 9	gizz	1			
					1	1	one sweep in one vial for birds 1-9
		adult 10	gizz	1	1	1	
		adult 11	gizz	1	1	1	
		adult 12	gizz	1	1	1	
10/04/95		family 1			1	1	no gizzard or oes. check GP's notes
11/04/95		family 2	gizz	1	1	1	
		family 3	gizz	1	1	1	
		family 4	gizz	1			
		family 5	gizz	1	1	1	Sweep for family 4 & 5 in one vial
02/05/95		adult 1	gizz/oes	2			
		chick c1	gizz/oes	2			
		chick c2	gizz/oes	2			
					1	2	
		adult 2					missing, presume escaped shot?
		chick 2a	gizz/oes	2			
		chick 2b	gizz/oes	2			
		chick 2c	gizz/oes				
					1	1	other vial damaged
		adult 3	gizz/oes	2			
		chick 3a	gizz/oes	2			
		chick 3b	gizz/oes	2			
		chick 3c	gizz/oes	2			
					1	2	
		adult 4	gizz/oes	2			
		chick 4a	gizz/oes	2			
					1	2	
		adult 5	gizz/oes	2			
		chick 5a	gizz/oes	2			
					1	2	

DEPARTMENT OF
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SCIENCE & INFORMATION DIVISION
WILDLIFE RESEARCH CENTRE, WOODVALE
FAX NO (09) 306 1641 TELEPHONE NO (09) 405 5100



22

Date: 30/1/96
To: SIM LANE GRANT FYI
At: BUSSELTON
From: ALAN C.
No of Pages: 3
(including face sheet)

Message:

I have documented the Lake Bullard ~~area~~ but
contests and swamp samples are they
clear enough? Should I proceed to do the
same for Mornion samples? Do you want
me to discuss roosting techniques with
Andrew Storey or others?



LAKE BALLARD 1995
INVERTEBRATE SWEEPS AT CAMP ISLAND AND CROSSOVER LAKE

Date	Site	Sweep No.	Vials	Comments
15/03/95	Camp Island	1	1	250um net was used
01/04/95	Camp Island	1	1	110um net was used
		2	1	
		3	1	
01/04/95	Crossover Lake	1	1	It seems 2 lots of samples were taken for this date. check GP's notes
		2	1	
		3	1	
		1	3	
09/04/95	Camp Island	1	1	
		2	1	
		3	1	
11/04/95		1	1	
		2	1	
		3	1	
28/04/95		1	2	
		2	2	
		3	2	
04/05/95		1	2	
		2	1	2nd vial damaged
		3	2	
09/06/95		1	2	
		2	2	
		3	2	
09/06/95	Crossover lake	1	4	

LAKE BALLARD 1995
 BANDED STILT GUT CONTENTS AND SWEEP SAMPLES

Date	Site	Bird	Contents	Vials	Sweep	Vials	Comments
02/04/95		adult 1	<i>gizz</i>	1			
		adult 2	<i>gizz</i>	1			
		adult 3	<i>gizz</i>	1			
		adult 4	<i>gizz</i>	1			
		adult 5	<i>gizz</i>	1			
		adult 6	<i>gizz/oes</i>	1			
		adult 7	<i>gizz/oes</i>	1			
		adult 8	<i>gizz/oes</i>	1			
		adult 9	<i>gizz</i>	1			
					1	1	one sweep in one vial for birds 1-9
		adult 10	<i>gizz</i>	1	1	1	
		adult 11	<i>gizz</i>	1	1	1	
		adult 12	<i>gizz</i>	1	1	1	
10/04/95		family 1			1	1	no gizzard or oes. check GP's notes
11/04/95		family 2	<i>gizz</i>	1	1	1	
		family 3	<i>gizz</i>	1	1	1	
		family 4	<i>gizz</i>	1			
		family 5	<i>gizz</i>	1	1	1	Sweep for family 4 & 5 in one vial
02/05/95		adult 1	<i>gizz/oes</i>	2			
		chick c1	<i>gizz/oes</i>	2			
		chick c2	<i>gizz/oes</i>	2			
					1	2	
		adult 2					missing, presume escaped shot?
		chick 2a	<i>gizz/oes</i>	2			
		chick 2b	<i>gizz/oes</i>	2			
		chick 2c	<i>gizz/oes</i>				
					1	1	other vial damaged
		adult 3	<i>gizz/oes</i>	2			
		chick 3a	<i>gizz/oes</i>	2			
		chick 3b	<i>gizz/oes</i>	2			
		chick 3c	<i>gizz/oes</i>	2			
					1	2	
		adult 4	<i>gizz/oes</i>	2			
		chick 4a	<i>gizz/oes</i>	2			
					1	2	
		adult 5	<i>gizz/oes</i>	2			
		chick 5a	<i>gizz/oes</i>	2			
					1	2	

Faxes (29/11 & 23/11/1995) from ACI to JL in which ACI writes that the area of Lake Marmion is 35,312 hectares and its catchment area (including the lake area) is 329,700 ha. Lake Marmion's lake bed elevation is estimated to be 354 mAHD (NW section) and 352 mAHD (SE section). ACI says the area of Lake Ballard is c.60,500 ha and its catchment area is c.1,390,000 ha.

DEPARTMENT OF
CONSERVATION AND LAND MANAGEMENT
SCIENCE & INFORMATION DIVISION
WILDLIFE RESEARCH CENTRE, WOODVALE
FAX NO (09) 306 1641 TELEPHONE NO (09) 405 5100



Date: 29/11/95

To: SIM LANE

At: BUSSELTON

From: ALAN CLARKE

No of Pages: 1
(including face sheet)

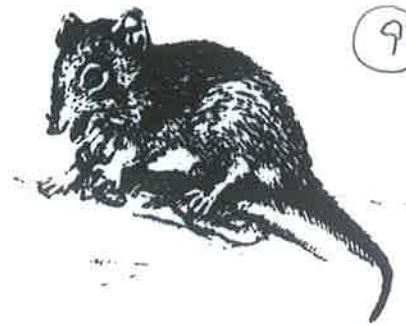
Message: [AREA OF LAKE MARMION 35312 ha
CATCHMENT AREA OF LAKE MARMION 329700 ha
(INCLUDING LAKE AREA)

ELEVATION OF LAKE BED NORTH WEST SECTION 354m AHD

SOUTH EAST SECTION 352m AHD



DEPARTMENT OF
CONSERVATION AND LAND MANAGEMENT
SCIENCE & INFORMATION DIVISION
WILDLIFE RESEARCH CENTRE, WOODVALE
FAX NO (09) 306 1641 TELEPHONE NO (09) 405 5100



Date: 23/11/95

To: SIM LANE

At: BUSSELTON

From: ALAN CLARKE

No of Pages: 9
(including face sheet)

Message: I WILL ~~BE~~ MAIL THE OTHER INFORMATION TO
YOU

P.S. THE AREA OF LAKE BALLARD IS ~~1390~~ ^{≈60500 ha}
ITS CATCHMENT AREA IS ≈1,390,000 ha



4463447

Hand-written notes by JL recording a phone conversation with Jeremy Hogarth on 18/10/1995. Inter alia, JH apparently said Brenton Knott [UWA] is supervisor of Allan Savage (WA Museum??) who will do a 3yr PhD on brine shrimp. He has got funding and starts 01/01/1996'.

Extract (appears to be late Aug or early Sept 1995) from GBP's field notebook in which GBP writes 'Sort gut samples & retain each for ID [identification of contents]' and 'Sweeps – sort to family & retain' and 'Jim to talk to AW Storey'. Looks like GBP met with JL (& Y. Winchcombe re Vasse-Wonnerup water level loggers) in Busselton on this day and these were his notes relating to processing of BaSt gut samples and aquatic invertebrate sweep samples collected at Lakes Ballard and Marmion earlier in 1995.

This extract has been printed from the 1995 BaSt project 'Field Notebooks' RMCR. Refer to that RMCR if context or higher quality viewing required.

NE 229 95

395 22

649. 22

a case

6.811

D = 0990 m exposed life

Spring blown or behind

sample. Pollard will

mess spring - looks too

short - get longer or

stronger springs

Home do work on data
on Friday PM. in 10:30

Jim do advise on requirements.

Home has ledger - to show

hang.

1615 Mr. Burtin Office.

Converted data to Russell files

& copied to disks for Home to

use.

Returned Jim High books to Hoffman.

TB. Boat on highway

Volgograd Lakes Com

Two August 22

1000

Marine City Canal

Robin Centre

Monday + a.

Tuesday Noon

30/8/95 (Hong Fest)

Comm saws trader

Wine Boone with

Yampson with

of Wed with

Mining Co with

Dear Long for Kimberly with
to bring trader back

D Co

3 in south coast

Bar to East

Very stn Road

32 West-stn

+ middle

NC.

with

2nd Sak Self

1st Sak New

0/100

Sack out samples

retain each for 10

Sacks - sent to family

& return

Sent table to Andrews.
1815 TO both via
checked Town speaker.

AT volume 2/110

Muyumba Park.
To id form.
Lake Clifton

Ted. Hansen
097 391106
checks at 0900

call at 0830.

High lines on Lake
Phone No
Cock form.
007 891 200

Fax (29/8/1995) from JL to GBP in which JL writes, inter alia, 'Your suggestion that you go to Kal[goorlie] and [Lake] Ballard [after driving Perth to Esperance in the 2nd week of Sept 1995 for the routine SW wetlands monitoring run] is a good one ... As well as retrieving the logger [water level recorder on Lake Ballard] ... go (walk?) out to camp Island and do standard sweeps, water samples etc as before'.

FAX

Grant Pearson at Woodville

Re your fax of 28/8/95 1628 hrs!


(1) The split up of lakes between you, me and Alan looks good.

(2) Each of us needs to allow enough time to check out any Banded Shilt on the lakes we are visiting. Alan also needs to spend one day at Lakes Ogne and Indoon for thorough waterbird surveys. (a minimum of)

FIXED

(3) Your suggestion that you go to Kalk and Belkosh is a good one - provided it doesn't make the total days too rushed. As well as retrieving the logger, I would like you to go (well?) out to Camp Indent and do standard sweeps, water samples etc as before.

(4) Make sure I give you and Alan account codes for all expenses related to these days.


29/8/95

First page of a fax (23/8/1995) from JL to GBP in which he writes, inter alia, 'Monday's [JL added a note on 10/1/2014 questioning whether it was 'Mon' or Tues 22/8] air survey by Andy Chapman showed that Lake Marmion will be dry in a week or so and Ballard in the next month or two'.

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
BUSSELTON DISTRICT

FAX NO: (097) 521 432

TO: GRANT PEARSON

URGENT: YES/NO

AT: WRC

Fax No.

FROM: JIM LANE



DATE: 23/8/95

Your Ref:

Local Ref:

No. of pages inc. this page: 3

Please call us on (097) 521 677 if this message was incomplete or illegible

WATKINS 1993 A NATIONAL FISH FOR SOUTHERN AUSTRALIA IN
Australia). The number in brackets is the highest known count,
as given in Watkins 1993. Mike Bamford will be able to give you
advice on who might be approached about which sites. I have
asterisked the sites I think you are most likely to find people
for.

- Lake McLeod (53 100)
- E Lake King (30 000)
- * E Lake Gore (20 000)
- Shark Bay (14 500)
- Lake Grace North (12 000)
- Walyormouring lake (10 700)
- * E Lake Warden (10 000)
- * Peel Inlet (9 000)
- Lake Hinds (8 000)
- Lake Kwoornicup (7 000)
- Lake Dumbleyung (6 000)
- Lake Mears (5 200)
- E Culham Inlet (5 000)
- Oidon wetlands (Esperance)
- Lake Quarbino (Wagin) (4 500)
- Nambling (nearby lake) (3 000)
- Lake Ninan (3 000)

too remote?
rarely has water/stilts?
ask Hood? researcher?
too remote?
too remote?
Esperance resident?
we are doing (Creery?)

CALM CSIRO Fisheries and Aquaculture Program

Mark Triller

ask Andy Chapman?

2 sites minimum basels and

Will Shivers & others
Gas Bill
Lucky Day Biggest
Legrande

23/8/95

TO: GRANT PEARSON

or was it Tim 22/8?
10/1/14

BANDED STILT MONITORING

Monday's air survey by Andy Chapman showed that Lake Marmion will be dry in a week or so and Ballard in the next month or two. The stilt are therefore starting to move and will very soon be headed for more watered parts near and on the coast.

What we need are a few observers (one each) at a few key localities where Banded Stilt are known to congregate as inland waters dry out, to record the following on a regular basis. Weekly or fortnightly would be great. monthly would also be very worthwhile.

The information required from each visit is:

- * Location
- * date and time
- * observer
- * total number of Banded Stilt
- * % with chestnut chest band
- * number with yellow leg flags or metal leg bands or both
- * whether or not each of the banded/flagged birds has a chest band.

The few localities could be chosen from the following list (from Watkins 1993 *A National Plan for Shorebird Conservation in Australia*). The number in brackets is the highest known count, as given in Watkins 1993. Mike Bamford will be able to give you advice on who might be approached about which sites. I have asterisked the sites I think you are most likely to find people for.

- Lake McLeod (53 100)
- E Lake King (30 000)
- * E Lake Gore (20 000)
- Shark Bay (14 500)
- Lake Grace North (12 000)
- Walyormouring lake (10 700)
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- Lake Kwoornicup (7 000)
- Lake Dumbleyung (6 000)
- Lake Mears (5 200)
- E Culham Inlet (5 000)
- Gidon wetlands (Esperance)
- Lake Quarbind (Wagin) (4 500)
- Nambling (nearby lake) (3 000)
- Lake Ninan (3 000)

too remote?
rarely has water/stilts?
ask HOOP researcher?
too remote?
too remote?
Esperance resident?
we are doing (Creery)
ask Andy Chapman?

CALM CSIRO Audubon or a similar Program

Monk Trilaw

2 sites minimum basels
cont