

(1)

RESEARCH FOR SUMMER OF 1944

Prof. R. Matheson

DIARY FOR SUMMER OF 1944

NOTE:

1. Dr. Stockard's 10 clams gotten at Old Log Lab. on May 2, 1944. In paraffin in Flint. Two are already sectioned and on slides.

2. Clem's 9(?) were taken on May 29, 1944. Shipped to Ann Arbor. In 10% formalin in Flint.

June 15. Douglas Lake.

Preserved 10 clams from above lake in 15% formalin, two days later transferred to 70% alcohol. Most females with eggs. Refer to PRESERVATIONS.

June 16-19.

The clams from Douglas Lake (at least) are not shedding glochidia. However, in aquaria, many egg sacs are aborted.

June 21. Wednesday. Ocqueoc Lake.

Gathered two tubs of clams. Caught many perch. Most already infected with glochidia. Placed in Cage 10. All died later in summer before any observations could be made.

June 22. Thursday. Preservation.

Preserve 10 from Ocqueoc; 50 from Douglas Lake, planted there last year; 5 from Douglas Lake, from several years ago.

June 23. Friday.

Place clams from Ocqueoc Lake in inoculating (infecting) aquaria (Nos. 1-7); also place those from Douglas Lake in inoculating aquaria (Nos. 8-10).

Find first glochidia in Ocqueoc group. Appear to be dead.

Later same day: Observe first clam shedding glochidia.

Are suspended on mucus thread, resembling rough spider web. Can tell if glochidia are alive by placing part of fish fin in petridish with glochidia.

June 25. Sunday.

Most infected fish have died of water mold.

Catch more, infect them, and place in cages with sticks, etc. for shade and protection.

June 26. Monday.

Clean any dead fish from cages.

Glochidia being liberated constantly.

June 27. Tuesday.

Parasitize cages 1, 2, 3, and 4, in forenoon. Place sticks on bottom. 25 perch to each cage. Infect for about 4 or 5 minutes. Ocqueoc glochidia were used.

June 28. Wednesday.
Use different aquaria. Infect enough for cage 10 (25 perch); also 25 in cage 9; also cage 9 total is 25. Take dead perch from cages.

June 29. Thursday.
Catch perch and rock bass in morning. Parasitize perch. Preserve clams. Refer to field notes.

June 30. Friday.
Parasitize 20 rock bass, put in cage 5.

July 1. Saturday.
Strip glochidia from clam and inoculate perch in clean aquaria.
Glochidia viable from 11:00 A.M. on through day. Inoculate 35 perch.

July 2. Sunday.
Glochidia still alive. Inoculate 19 perch.

July 2-9.
Many perch die of *Bacillus columnaris* (Bull. of the Bureau of Fisheries, Vol. XXXVIII, 1921-22, Document No. 924, by H.S. Davis).

July 10.
To Occoec Lake.
(1) Take water sample.
(2) Catch several perch, all infected.
(3) Bring back tub of clams.
(4) Find one gravid female.
At Douglas Lake
(1) Catch 15 (approx.) perch, 1 black bass. Infect artificially.

July 11.
Place infected perch, two to an aquarium.
Kill black bass, infected.

July 17.
Vacuum bottoms of cages 1, 2, 3, 4, and 5. All of June 23 but number 5 (June 27).

July 18.
Look over cage samples:
Cage 1: At least one live young
Cage 2: Many live young and dead ones.
Cage 3: No young.
Cage 4: Few live young and dead.
Cage 5: No young.



Have pictures taken of young.

Measurements:

.462 mm.
.504 mm. Average .518 mm.
.588 mm.

Study activities:

1. Very agile
2. Foot adhesive
3. Foot ciliated on end

July 19. Wednesday.

1. Vacuum bottom of cages 1, 2, 3, 4, and 5.
2. Perch of June 27 killed, no sign of glochidia.
3. 3 rock bass of July 2 killed, no glochidia.
4. Look over cage samples: Many found in cage 2; none in cage 1;

July 20. Thursday.

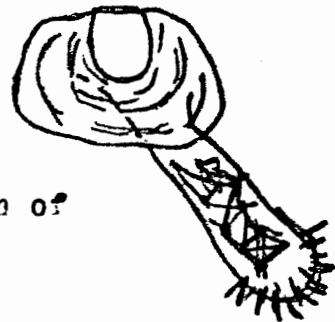
1. To Ocauec Lake with Invertebrate class all day.
2. Preserve *Lasnigona costata*.
3. Find more young clams in cage 2; 2 live from cage 3.

July 21. Friday.

1. Kill perch of June 23. No glochidia found.
2. Place finger bowl of clay and finger bowl of sand in aquarium. Place 5 young in each. Flood with lake water and leave.
3. Study young:
 - a. End covered with cilia; beat rhythmically when foot is extended; no beating when forward or stopped; cilia quit beating and form suction pad when foot extended and not moving.
 - b. Many diatoms, also one-celled animals at opening of shell; placed there by currents of water; many go into mantle cavity.
4. Examine bottom of aquaria of fish infected July 10. None found.

July 23. Sunday.

1. Kill all fish (14 left) infected June 23.
2. No signs of glochidial infection.
3. Kill all fish infected July 2, were 18 left.
4. Kill all rock bass (18) infected July 1. No sign of infection.
5. Take pictures, 39 exposures.



July 25. Tuesday.

Measure baby clams:

.504 mm. .588 mm. .588 mm. .462 mm.
.630 mm. .588 mm. .588 mm. .630 mm.
.630 mm.

Average .576 mm.

July 26. Wednesday.

Make gill slides:

- a. Infected July 10-13, 3 days, 11 slides.
- b. Infected July 10-21, 11 days, 2 slides.

July 27. Thursday.

Examine dead infected perch of July 10. Glochidia in good shape. Seem to have increased in size, about ready to drop.

July 28. Friday.

1. Get many young clams from aquaria. Fish all infected July 10.



Very active; very little development visible.

2. Examine infected perch. Many young still incysted.

July 29. Saturday.

1. Take pictures of new clams. Two films of about 30 per film.
2. Examine live infected perch. Many young clams still incysted. One dropped off but did not move.

July 30. Sunday.

1. Sink cages (buckets) into lake with 10 lettered clams in each. (Refer to data sheets for temperature, etc.) Clams gotten July 10 from Cecueoc. Starved until July 28 (18 days). Placed in lake (log lab.) until today (2 days). Weighed in tenths of grams by displacement of water. Scales readjusted for each clam. Placed in lake where water was 19 Meters deep.

July 31. Monday.

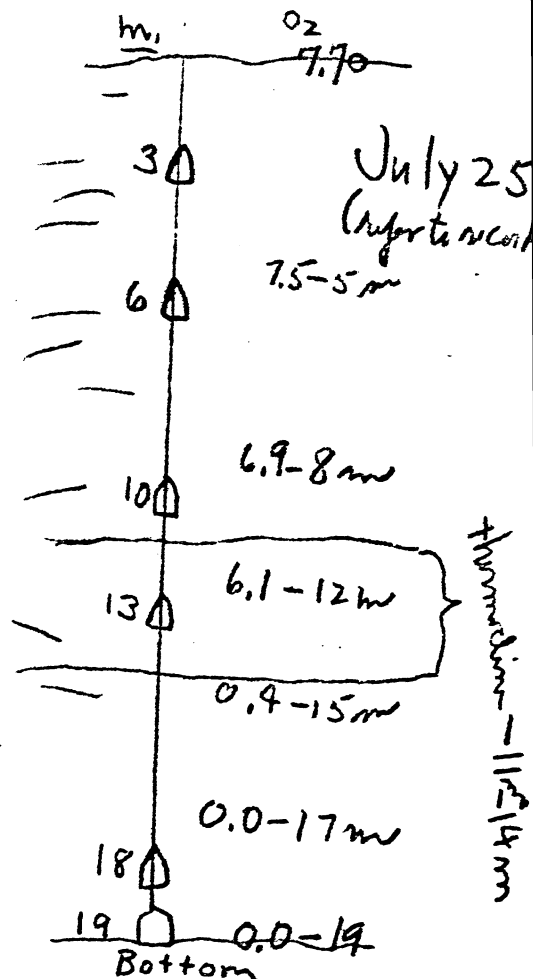
Glochidia gone from gills (other than one or two).

August 1. Tuesday.

Raise colony from North Fishtail Bay, Douglas Lake. Get many not gotten before (calm day). Weigh and measure and return.

August 2. Wednesday.

1. Raise clam colony in Lancaster Lake. Get 68. Bottom covered with fine ooze. Clams all deeply buried. Many lying on side as bottom is hard sand.
2. Examine baby clams.
 - a. Last group now have narrow rim of shell around glochidial shell; can't distinguish organogenesis to very great extent. Foot long and narrow.



- b. Older ones have put on considerable growth. Gills becoming much more evident, seem to increase in number. Very active algae, etc. can enter the mantle cavity at this stage.

c. Measurements on older ones:

16 16 13 14 14 14 14

August 3. Thursday.

- 1. One clam placed on desk July 17 died. Had been at the temperature of the room with no water.
- 2. Raise, measure, and return colony at Vincent Lake after returning colony to Lancaster Lake.

August 4. Friday.

- 1. Kill all perch formerly infected. Fix gills in formaline for preservation. Many parasitic worms on gills. No evidence of glochidia.
- 2. Isolate 13 young(second group). Only from a couple aquaria.

August 5. Saturday.

Raise clams at Station 1 in Bar Lake. Weigh measure and return.

August 6. Sunday.

Raise clams at Station 2 in Bar Lake. About 80-100 have been stolen. Rest weighed and measured.

August 7. Monday.

- 1. Take Physical-chemical data on stations at Bar Lake.
- 2. Preserve 10 *Lasmigona complanata* and 1 *Anodonta grandis*.
- 3. Physical -chemical records on separate sheets.

August 9. Wednesday.

Raise clam cages at floats:

3m. 1 dead, 9 alive(bucket)
 6m. 1 dead, 9 alive(bucket)
 10m. all 10, alive(bucket)
 13m. all 10 alive(case)
 18m. all 10 alive(case)
 19m. 1 dead or dying, 9 alive(case)

Physio-chemical data also taken, refer to records.

August 10. Thursday.

- 1. Measure older group:

.924 mm.	.756 mm.	.882 mm.	.420 mm.
.840 mm.	.798 mm.		
- 2. Measure younger group:

.294 mm.	.294 mm.	.294 mm.	.294 mm.
.294 mm.	.315 mm.	.252 mm.	.336 mm.
- 3. Take photograph of both older and younger clams.
- 4. Younger have increased much in size.

August 11. Friday.

1. Rasse colony at Ocqueoc Lake. Take only 100. Most of entire colony in evidence.
2. Examine clam which has laid on desk at room temperature since July 17. Still alive. Should not have killed it. Killed Friday night.

August 12. Saturday.

Survey trip to Hubbard Lake.

Check (refer to collection):

1. Swan Lake
- 1a. Swan River
2. Little Lake
3. Grand Lake
4. Long Lake
5. Alpena (bridge), Thunder Bay River
6. Hubbard Lake
(Collections at all lakes but Hubbard)

August 13. Sunday.

From Hubbard Lake to:

7. South Branch River at First Bridge from Hubbard Lake.
8. South Branch River 1 mile farther north from 7.
9. South Branch River 2 miles NE from no 8
10. Devil's Lake
11. Thunder Bay River above dam, Alpena City Park.
12. Thunder Bay River at Oxbow above Alpena

August 14. Monday.

From Hubbard Lake to:

13. Wolf Creek above dam.
14. Thunder Bay River 1 mile SSE of Orchard Hill.
15. Thunder Bay River 1/2 mile S of Long Rapids.
16. North Branch River 2 miles SE of Sunken Lake.
17. East shore of Lake Emma. PRESENT
18. Two points on East Shore of Lake May. Not present.
19. Lake Nettie, north shore. PRESENT
20. Road bridge between Lake Nettie and Upper Barnhart Lake. PRESENT
21. Upper Barnhart Lake, south shore. PRESENT
22. Ocqueoc River, 2 miles NE of Millersberg. Not present.

August 15. Tuesday.

Clean clams for collection.

August 16. Wednesday.

1. Clean clams for collection.
2. Preserve certain clams and number shells.
3. List 1 clam that repaired shell when cracked.
4. List 1 clam with pink instead of purple nacre.
5. Preserve A101-A110 for series.

August 17. Thursday.

Mount older badly clams which were killed at time of first discovery on slides.

August 20. Sunday.

1. Clean out aquaria of older clams. Place in jar for transportation. Gills, etc, clearly visible.
2. Also start cleaning out younger clams.

August 21. Monday.

1. Finish cleaning up young.
2. Considerable growth beyond glochidial shell.
3. Small creatures can swim inside of mantle cavity of clam.
4. Try floatation method. No good as young pinch onto algae and float out.
5. Young have valves apart very much of time.
6. Take pictures of both old and young.

August 22. Tuesday.

1. Pull in buoys, etc.
2. Take in vertical cages

5m.	9	alive
6m.	9	"
10m.	10	"
13m.	9	"
18m.	8	"
19m.	9	"
3. Take cages to boat-house
4. First suck bottom of cages for older clams who have had out-door conditions.
5. Examine material of bottom.
6. Find quite a few dead ones; one just dead. Few(very few) live ones. Why did they die? Cages were down about 8 feet. Observe and preserve flat works which infested Gyris, etc.

end

PRESERVED MATERIALS 1944

1. June 20, 1944. Aborted Ovisacs.
2. June 21, 1944. Infected gills from perch in Ocqueoc Lake.
3. June 23, 1944. Glochidia(alive) still in mucous network.
4. June 27, 1944. Gills from perch infected today. Fish killed about 2 hours later. Many glochidia present.
5. June 28, 1944. Glochidia(alive) from infecting aquaria.
6. June 28, 1944. Infected gills from perch infected yesterday. Heavily infected.
7. July 2, 1944. Gills infected on June 27, infected; 10:30A.M.
8. July 4, 1944. Gills from infected perch of 4 days; very much infected.
9. July 5, 1944. Gills(highly infected) from perch infected July 2(two samples).
10. July 11, 1944. Gills from perch infected last night(about 8 hours).
11. July 11, 1944. Gills from black bass(striped gill-plates, kind?) infected 16 hours. Several encysted glochidia.
12. July 11, 1944. Gills from naturally infected perch from Ocqueoc Lake on July 10.
13. August 4, 1944. Gills from fish(perch) who had recently dropped their glochidia. Hope to see cysts (empty). Fixed in formalin and placed in alcohol August 10.
14. August 4, 1944. Same as above.
15. August 22, 1944. Bodies of older shells of clams found while going over bottom material of cages in lake. Very large. Also soft parts of one body. Also flat worms with Cypris, etc. inside.

PRESERVATIONS FOR SECTIONING

1944

- July 15, 1944. A1-A10.
 All from Douglas Lake. Placed in the lake last summer. Fixed in 15% formalin. Left in formalin for 36 hours (approx.). Then transferred to 70% alcohol.
 A5 with eggs
 A6 decidedly with eggs
 A7 decidedly with eggs
 A9 eggs just beginning
- June 22, 1944. A11-A20 from Cogueoc Lake
 A21-A25 from Douglas Lake (last year)
 A26-A30 from Douglas Lake (several years)
 A13 eggs well developed
 A14 eggs well developed
 A15 eggs very well developed, even in inner sill
 A19 eggs just starting
 A22 signs of eggs
 A23 eggs well developed
 A24 eggs well developed
 A25 tubes with something in them, maybe eggs
- June 29, 1944. A31-A36 from Cogueoc Lake
 A37-A40 from Douglas Lake
- July 1, 1944. A41-A47.
 All were opened in looking for a gravid female.
 All were either males or females who had shed.
- July 6, 1944. A48-A60 from Douglas Lake
 A61-A70 from Cogueoc Lake (in D.L. for 4 weeks)
 A60 boiled
- July 12, 1944. A71-A80 directly from Cogueoc Lake
- July 15, 1944. AC1-AC6 (Alasmidonta calceolus)
 Boiled
AC2 and AC3, no shell
 also---
R1-R10 (Elliptio complanatus)
 Boiled
Small, for total mounts
 also---

A81-A90 from Ocqueoc Lake on July 10
Boiled

July 20, 1944. LC1-LC20 (*Lasmigona costata*)
Boiled
No shells

July 24, 1944. LS1-LS10 (*Lasmigona siliquoides*)
Boiled
Small for total mount
From Douglas Lake
also---
LN1-LN12 (*Ligumia nasuta*)
Boiled
LN11 not boiled
From Douglas Lake
also---
AG1-AG12 (*Anadonta grandis*)
AG3 and AG4 not boiled
From Douglas Lake

July 28, 1944. A91-A100
Boiled
All starved for 18 days
A93 and A94 not boiled

August 6, 1944. LC1-LC10 (*Lasmigona complanata*)
From Bar Lake
also---
AG13 (*Anadonta grandis*)
From Bar Lake
All of above boiled

August 15-16, 1944. All boiled
AF1-AF3 from Swan Lake
AF4-AF8 from Grand Lake
AF9 from North Branch of Thunder Bay River (SE
of Sunken Lake)
AF10-AF20 from Black Lake
Anadontoides ferrassacianus
AG1-AG6 from Little Lake
AG1 from ~~Tronona Lake~~ ~~May~~
Anadonta grandis (*marginata*)
SR1 from Grand Lake
SR2 (may be called 1) from Alpena City Park
Strophitus rugosus
LC21-LC213 from Ocqueoc River at road below
Lake Hettie
LC214-LC215 Maple River East of Bryant's Bog
Lasmigona compressa

ED1-ED17 from Thunder Bay River at Long Rapids

Elliptic dilatatus

LV1-LV3 from Black Lake Outlet

Lampsilis ventricosa

XO1-XO3 from Iroquois City Park

unknown

also

A101-A110 from Lake Emma

A4 to A10 small ones

RECLAIMED FROM BAR LAKE AUGUST 5, 1944

MEASURED FOR LENGTH, HEIGHT, WIDTH, AND WEIGHT AND RETURNED

STATION NO. 1

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
1	a	120	60	33	170	Water level
2	ab					
3	ac	132	70	36	223	far above
4	ad	126	66	32	160	
5	ae	126	70	36	201	normal.
6	af	150	75	41	310	
7	ag					
8	ah					
9	ai					
10	aj					
11	ak					
12	al	120	65	38	189	
13	am	122	66	33	175	
14	bn					
15	bo					
16	bp					
17	bq	136	69	37	200	
18	br					
19	bs	120	67	32	150	
20	bt	123	69	38	223	
21	bu					
22	bv	129	65	34	181	
23	bw					
24	bx	128	64	35	170	
25	by	126	68	35	185	
26	bz					
27	ca	122	64	30	147	
28	cb					
29	cc					
30	cd					
31	ce	132	74	39	251	
32	cf	107	59	27	98	
33	cg	115	63	29	128	
34	ch					
35	ci	145	71	36	211	

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
36	df	125	68	33	170	
37	dg					
38	dh	117	60	34	158	
39	di	124	63	30	148	
40	dj	123	68	40	dead	
41	dk					
42	dl	133	67	40	223	
43	e					
44	ef	114	58	28	115	
45	eg					
46	eh					
47	ei	116	68	32	166	
48	ej	123	62	34	161	
49	ek					
50	el					
51	f	110	56	30	113	
52	fg	128	66	36	204	
53	fh	138	69	34	204	
54	fi	133	69	41	232	
55	fj	124	72	37	208	
56	fk	108	54	30	107	
57	fl					
58	f	138	74	40	289	
59	gh	130	65	35	193	
60	gi	122	64	39	201	
61	gj					
62	gk	131	66	36	180	
63	gl	124	70	35	213	
64	h	121	65	30	140	
65	hi	123	64	32	144	
66	hj					
67	hk	121	64	33	151	
68	hl					
69	i	126	65	34	174	
70	ij	120	62	33	155	
71	ik	104	58	30	125	
72	il	112	57	30	113	
73	j	112	56	32	121	
74	jk	112	60	30	121	
75	jl					
76	k					
77	kl	141	74	38	264	
78	l					
79	aa	131	69	44	275	
80	aabb	139	74	40	272	

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
81	aacc	134	73	40	259	
82	aadd					
83	aaaa	133	69	35	197	
84	aaff	124	65	37	190	
85	aagg					
86	aahh	121	66	36	189	
87	aaif	133	67	34	171	
88	ajjj					
89	aakk					
90	aall					
91	bb					
92	bbee	121	62	37	179	
93	bbdd					
94	bbee	130	68	37	203	
95	bbff					
96	bbgg					
97	bbhh					
98	bbif					
99	bbjj	115	64	30	135	
100	bbkk					
101	bbll	131	72	40	290	
102	cc	122	66	31	158	
103	codd	126	65	37	197	
104	cccc					
105	ccff	117	60	34	146	
106	ccgg	125	66	33	185	
107	cchh	118	64	32	153	
108	ccif	127	67	41	238	
109	ccjj	123	64	31	150	
110	cckk	112	63	34	146	
111	ccll					
112	dd	123	69	36	197	
113	ddee	123				
114	daff					
115	ddgg	118	64	31	156	
116	ddhh					
117	ddif					
118	ddjj	120	62	31	150	
119	ddkk	111	57	31	117	
120	ddll	138	73	38	254	
121	ee	123	66	32	162	
122	eeff	106	60	30	112	
123	eegg	128	63	37	190	
124	eehh					
125	eeif					

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
126	eejj					
127	eekk	127	67	38	212	
128	eell	111	62	31	127	
129	ff	111	61	27	108	
130	ffgg	112	57	26	97	
131	ffhh					
132	ffii					
133	ffjj					
134	ffkk	124	67	39	200	
135	ffll					
136	gg					
137	gghh					
138	ggii	142	75	38	260	
139	ggjj	127	71	40	237	
140	ggkk	122	61	32	132	
141	ggll					
142	hh	120	60	33	137	
143	hhii					
144	hhjj	120	68	34	181	
145	hhkk	114	59	33	128	
146	hhll	121	61	36	162	
147	ii	120	64	34	159	
148	iijj					
149	iikk	109	58	31	120	
150	ii ll	125	65	36	188	
151	jj					
152	jjkk					
153	jjll	115	57	27	107	
154	kk	116	59	32	150	
155	kkll	111	60	32	129	
156	ll	126	66	35	177	
157	abb	113	60	30	129	
158	acc					
159	add	115	59	30	120	
160	ae					
161	aff	136	69	34	188	
162	app	140	78	42	296	
163	ahh	118	61	35	159	
164	aii					
165	aij					
166	akk					
167	all	126	66	32	145	
168	baa	126	68	34	183	
169	bcc					
170	bdd					

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
171	bee	136	71	35	207	
172	bff	137	70	34	186	
173	bfg					
174	bhh					
175	bii	120	66	39	220	
176	bjj					
177	bkk	125	70	36	209	
178	bll					
179	caa	114	61	31	122	
180	cbb					
181	cdd					
182	cee	139	74	40	258	
183	cff	138	71	37	218	
184	cgg	132	67	33	176	
185	ohh					
186	cii					
187	cjj	134	65	37	186	
188	ckk	130	73	34	206	
189	cll	137	70	36	197	
190	daa					
191	dbb					
192	dcc	119	66	35	177	
193	dee	133	66	32	159	
194	dff					
195	deg	120	66	32	158	
196	dhh	134	70	34	195	
197	dii	132	69	36	210	
198	djj					
199	dkk					
200	dll	119	61	30	130	

RECLAIMED FROM BAR LAKE AUGUST 6, 1944

MEASURED FOR LENGTH, HEIGHT, WIDTH, AND WEIGHT AND RETURNED

STATION NO. 2

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
4	edd	119	59	27	113	
5	eff	119	65	35	163	About 100 clams
21	fee	131	69	35	205	stolen from
21	fkf	123	67	32	152	colony by young
33	gll	122	64	30	133	boys.
38	hee	122	60	33	149	
41	hii	136	69	38	223	
50	iff	110	61	33	138	
66	jll	117	65	32	146	
70	kdd	122	62	33	164	
85	lhb	118	63	29	135	
87	ljj	124	69	37	203	
88	lkk	128	71	33	168	
94	hbc	128	65	36	202	
97	kbc	152	77	44	301	
100	ecd	132	66	33	171	
101	fed	122	60	35	174	
108	bde	130	67	32	157	
110	gde	142	75	47	dead	
116	aef	138	71	37	232	
121	ief	109	56	30	114	
129	hfg	130	71	34	208	
133	lfg	126	68	35	dead	

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
136	ogh	120	65	32	171	
137	dgh	125	69	32	175	
138	egh	119	64	35	164	
139	igh	135	67	35	200	
140	jgh	121	59	33	144	
144	bhi	106	59	28	96	
146	dhi	119	60	29	125	
147	ehi	127	69	35	200	
151	lhi	122	66	34	163	
152	aij	128	72	34	185	
158	rij	119	62	36	183	
164	djk	109	59	29	104	
169	ljk	121	66	30	142	
174	ekl	105	60	30	106	
175	fk1	136	68	39	237	
195	fcde	125	71	35	198	
197	hcde	123	67	34	159	

RECLAIMED FROM LANCASTER LAKE AUGUST 2, 1944

MEASURED FOR LENGTH, HEIGHT, WIDTH, AND WEIGHT

RETURNED TO LANCASTER LAKE AUGUST 7, 1944

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
1	a					
2	ab	135	69	35	206	
3	ac	130	69	33	171	
4	ad					
5	ae	124	64	34	155	
6	af					
7	ag					
8	ah					
9	ai	140	71	36	222	
10	aj					
11	ak					
12	al					
13	b					
14	bc	137	68	33	182	
15	bd	124	64	33	157	
16	be					
17	bf	116	64	36	172	
18	bg	110	56	28	94	
19	bh	125	73	32	191	
20	bi					
21	bj					
22	bk	130	65	31	162	
23	bl	118	62	30	134	
24	c					
25	cd	125	67	33	162	
26	ce	134	65	40	243	
27	cf					
28	cg					
29	ch					
30	ci					
31	cj	117	63	32	142	
32	ck					
33	cl	133	67	38	218	
34	d					
35	de	126	65	32	155	

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
36	df					
37	dg	148	74	38	243	
38	dh	137	69	33	168	
39	di	109	60	34	119	
40	dj					
41	dk					
42	dl					
43	e					
44	ef					
45	eg					
46	eh					
47	ei					
48	ej					
49	ek					
50	el					
51	f	131	67	36	180	
52	fg					
53	fh					
54	fi	118	62	29	124	
55	fj					
56	fk					
57	fl					
58	g					
59	gh	127	69	32	215	
60	gi	117	64	29	130	
61	gj	114	58	29	110	
62	gk	114	61	30	135	
63	gl					
64	h					
65	hi	124	65	30	136	
66	hj					
67	hk					
68	hl					
69	i					
70	ij	103	51	27	84	
71	ik					
72	il					
73	j					
74	jk					
75	jl	111	57	30	119	
76	k					
77	kl					
78	l					
79	aa	130	73	38	255	
80	aabb					

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
81	aacc					
82	aadd					
83	aaee					
84	aaff					
85	aagg					
86	sahh					
87	saii					
88	sajj					
89	sakk					
90	sall					
91	bb	108	56	28	99	
92	bbcc					
93	bbdd					
94	bb ee					
95	bbff					
96	bbgg	127	70	34	182	
97	bbhh					
98	bbii					
99	bbjj	137	66	36	219	
100	bbkk	122	69	33	175	
101	bbll					
102	cc					
103	ccdd	128	68	34	195	
104	cc ee					
105	ccff					
106	ccgg					
107	cchh					
108	ccii	111	62	35	142	
109	ccjj	127	67	35	164	
110	cckk					
111	ccll	126	68	36	174	
112	dd					
113	dd ee	118	63	39	201	
114	ddff					
115	ddgg					
116	ddhh	103	53	26	77	
117	ddii	126	62	36	172	
118	ddjj	101	54	28	76	
119	ddkk					
120	ddll					
121	ee	123	68	36	188	
122	eeff	133	67	30	150	
123	ee gg					
124	eehh	128	67	34	170	
125	eeii					

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
126	eejj					
127	eekk	130	69	37	187	
128	eell	118	66	34	167	
129	ff					
130	ffgg					
131	ffhh	118	65	34	153	
132	ffii					
133	ffjj	128	70	31	164	
134	ffkk	130	66	38	201	
135	ffll					
136	gg	129	69	34	193	
137	gghh	120	66	33	154	
138	giii					
139	ggjj					
140	ggkk					
141	glll					
142	hh					
143	hhii					
144	hhjj					
145	hhkk					
146	hhll					
147	ii					
148	iijj					
149	iikk					
150	ii ll	114	57	31	117	
151	jj					
152	jjkk	129	65	31	149	
153	jjll					
154	kk					
155	kkll	118	65	32	147	
156	ll	124	67	33	174	
157	abb					
158	acc	129	66	37	204	
159	add	130	68	33	194	
160	eee					
161	aff					
162	agg	130	67	36	187	
163	ahh					
164	aii	115	65	37	181	
165	ajj					
166	akk					
167	all					
168	baa					
169	bcc	123	66	36	191	
170	bdd					

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
171	bce					
172	bff	139	73	34	222	
173	bgg					
174	bhh					
175	bii	129	69	37	204	
176	bjj	118	64	36	162	
177	bkk					
178	bll	122	69	37	193	
179	caa					
180	cbb					
181	cdd					
182	cee					
183	off					
184	ogg					
185	chh	116	64	34	189	
186	cii					
187	cjj					
188	ckk					
189	cll					
190	daa					
191	dbb					
192	dcc					
193	dee	122	69	32	162	
194	dff					
195	dgg					
196	dhh					
197	dii	127	69	36	198	
198	djj					
199	dkk	109	55	28	98	
200	dll					

RECLAIMED FROM NORTH FISHTAIL BAY, DOUGLAS LAKE AUGUST 1, 1944

MEASURED FOR LENGTH, HEIGHT, WIDTH, AND WEIGHT

RETURNED TO NORTH FISHTAIL BAY, DOUGLAS LAKE AUGUST 1, 1944

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
1	a					
2	ab	100	52	25	75	
3	ac	114	64	35	dead	
4	ad	151	76	43	294	
5	ae	123	62	31	145	
6	af	124	68	29	145	
7	ag					
8	ah	94	47	24	58	
9	ai	116	61	30	128	
10	aj	132	69	34	194	
11	ak	125	65	37	195	
12	al					
13	b					
14	bc	121	62	33	157	
15	bd	134	67	39	231	
16	be					
17	bf					
18	bg	102	51	25	169	
19	bh					
20	bi					
21	bj	115	60	28	111	
22	bk					
23	bl	115	57	31	128	
24	c	119	64	32	148	
25	cd					
26	ce					
27	cf	119	65	32	149	
28	cg	128	66	36	dead	
29	ch	115	60	31	123	
30	ci					
31	cj	139	69	35	201	
32	ck	130	71	37	209	
33	cl					
34	d	127	66	33	167	
35	de					

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
36	df	118	64	34	156	
37	dg	130	69	33	187	
38	dh					
39	di					
40	dj	127	68	31	153	
41	dk					
42	dl					
43	e	114	60	30	117	
44	ef					
45	eg	127	70	34	186	
46	eh	128	68	35	dead	
47	ei					
48	ej	124	64	36	179	
49	ek	121	69	34	175	
50	el	127	61	33	152	
51	f	108	58	29	129	
52	fg					
53	fh	130	69	38	dead	
54	fi	139	71	33	193	
55	fj	119	61	34	164	
56	fk					
57	fl	117	61	33	146	
58	f	121	63	36	dead	
59	gh					
60	gi	114	61	28	115	
61	gj	87	43	23	45	
62	gk	119	61	34	162	
63	gl					
64	h	109	55	27	100	
65	hi					
66	hj	131	67	41	257	
67	hk					
68	hl	114	55	30	114	
69	i	100	55	28	90	
70	ij	126	63	32	157	
71	ik	129	69	37	209	
72	il	110	61	31	136	
73	j	101	51	24	76	
74	jk	110	59	31	129	
75	jl	118	61	27	116	
76	k	113	61	32	132	
77	kl	120	69	30	152	
78	l	128	72	37	229	
79	aa					
80	aabb					

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
81	aacc	129	71	34	183	
82	aadd	120	66	30	141	
83	aace	134	70	35	192	
84	aaff	122	62	36	167	
85	aaeg	110	59	27	110	
86	asbh	120	64	33	180	
87	asii	91	48	28	56	
88	asjj	119	64	30	145	
89	askk					
90	asll					
91	bb					
92	bbcc	125	61	38	184	
93	bbdd	114	60	29	115	
94	bbes	117	62	29	132	
95	bbff	128	55	35	175	
96	bbgg	124	62	31	146	
97	bbhh					
98	bbii	113	62	31	153	
99	bbjj	113	65	32	144	
100	bbkk	113	61	32	159	
101	bbll	118	62	30	131	
102	cc	121	64	36	184	
103	ccdd	102	52	24	70	
104	cces					
105	ceff					
106	cegg					
107	cchh	114	58	30	120	
108	ccii	98	52	22	61	
109	ccjj	131	66	36	184	
110	cekk	130	68	33	177	
111	ccll	112	61	33	142	
112	dd	128	73	32	181	
113	ddee	134	72	43	270	
114	ddff	125	73	34	202	
115	ddgg	132	69	38	230	
116	ddhh	121	66	34	189	
117	ddii	128	67	32	164	
118	ddjj	125	69	35	199	
119	ddkk	120	62	32	142	
120	ddll	114	63	29	123	
121	ee	108	59	27	98	
122	eeff					
123	eegg	130	67	32	170	
124	eehh	128	64	40	237	
125	eeii	121	62	36	168	

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
126	eejj	104	59	30	110	
127	eekk					
128	eell	139	74	40	305	
129	ff	134	68	39	dead	
130	ffgg	138	72	34	202	
131	ffhh	122	58	33	136	
132	ffii	110	58	25	90	
133	ffjj	130	71	35	198	
134	ffkk	120	68	39	204	
135	ffll	124	65	31	152	
136	gg					
137	gghh	119	62	36	177	
138	ggii	116	62	27	116	
139	ggjj	119	56	29	119	
140	ggkk	111	60	39	196	
141	ggll	124	64	35	156	
142	hh	124	75	36	210	
143	hhii					
144	hhjj	123	67	30	144	
145	hhkk	118	59	30	126	
146	hhll					
147	ii	116	62	31	140	
148	iijj	139	74	38	254	
149	iikk	123	65	33	155	
150	ii ll	120	63	31	153	
151	jj	116	60	28	130	
152	jjkk	139	69	31	172	
153	jjll	131	72	36	231	
154	kk	123	64	34	174	
155	kkll	129	67	34	190	
156	ll	130	65	35	dead	
157	abb	120	63	32	163	
158	acc	132	65	35	195	
159	add	117	63	31	139	
160	ae	125	64	30	141	
161	aff	136	72	37	210	
162	agg	120	66	34	178	
163	ahh	122	66	31	156	
164	aii					
165	ajj	135	70	39	237	
166	akk	118	57	29	111	
167	all	105	54	31	108	
168	baa	123	58	33	166	
169	bcc	125	67	42	241	
170	bdd	137	68	41	244	

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
171	bee	121	57	31	163	
172	bff	120	68	30	152	
173	bgg	125	66	35	178	
174	bhh	110	58	27	101	
175	bii					
176	bjj					
177	bkk	118	62	35	169	
178	bll	126	63	29	143	
179	caa					
180	cbb					
181	cdd	115	62	33	157	
182	cee	116	62	30	125	
183	cff	129	70	36	233	
184	cgg					
185	chh	127	66	36	187	
186	cii					
187	cjj					
188	ckk	109	56	32	121	
189	cll	119	60	32	146	
190	daa	133	68	43	255	
191	bbb	98	49	23	64	
192	dcc					
193	dee	128	65	39	223	
194	dff	130	66	36	185	
195	dgg	115	65	30	137	
196	dhh	103	51	23	64	
197	dii	110	57	27	102	
198	djj	94	49	23	60	
199	dkk	115	63	29	124	
200	dll	122	63	35	186	

RECLAIMED FROM OCQUEOC LAKE AUGUST 11, 1944

MEASURED FOR LENGTH, HEIGHT, WIDTH, AND WEIGHT

RETURNED TO OCQUEOC LAKE AUGUST 11, 1944

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
1	a					
2	ab					
3	ac					Only 100 clams
4	ad					taken deliber-
5	ae					ately. Prob-
6	af					ably could have
7	ag	129	65	34	166	
8	ah	115	65	32	143	
9	ai					
10	aj	121	68	36	190	gotten almost
11	ak	132	73	34	195	all of them.
12	al	125	60	36	164	
13	b	133	71	33	203	
14	bc	125	68	35	169	
15	bd					
16	be	120	67	35	189	
17	bf					
18	bg	119	65	34	156	
19	bh					
20	bi	134	67	34	173	
21	bj	109	52	27	85	
22	bk					
23	bl					
24	c					
25	cd	97	51	24	dead	
26	ce					
27	cf					
28	cg					
29	ch	113	61	28	111	
30	ci	101	54	28	89	
31	cj					
32	ck					
33	cl					
34	d	121	64	36	188	
35	de	115	61	27	104	

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
36	df					
37	dg					
38	dh					
39	di	106	55	30	110	
40	dj					
41	dk					
42	dl					
43	e					
44	ef					
45	eg	131	66	35	177	
46	eh					
47	ei	137	66	38	218	
48	ej	135	69	35	208	
49	ek	140	75	37	238	
50	el					
51	f					
52	fg					
53	fh	138	67	39	212	
54	fi	136	66	37	208	
55	fj					
56	fk	124	64	35	dead	
57	fl	131	67	33	164	
58	f	133	66	36	179	
59	fh					
60	fi					
61	fj					
62	fk					
63	fl					
64	h	133	64	35	183	
65	hi	130	68	31	163	
66	hj					
67	hk					
68	hl	134	72	36	210	
69	i	129	63	32	115	
70	ij					
71	ik					
72	il					
73	j					
74	jk	135	62	33	165	
75	jl	130	68	39	218	
76	k					
77	kl					
78	l	119	63	32	143	
79	aa					
80	aaab	128	66	30	150	

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
81	aacc	135	75	37	231	
82	aadd					
83	aaee	125	62	32	150	
84	aaff					
85	aagg	134	69	36	217	
86	aahh					
87	aaii	133	69	35	194	
88	ajjj					
89	askk	126	64	36	184	
90	aall	122	66	35	167	
91	bb	139	75	35	210	
92	bbcc	134	68	38	201	
93	bbdd	138	74	36	241	
94	bbee					
95	bbff					
96	bbgg	128	62	35	170	
97	bhhh	126	66	35	187	
98	bbii	111	56	28	102	
99	bbjj					
100	bbkk					
101	bbll					
102	cc					
103	ccdd	91	48	26	66	
104	ccce					
105	ccff	116	60	31	138	
106	ccgg					
107	cchh	132	68	32	153	
108	ccii					
109	ccjj	122	64	28	125	
110	cekk					
111	cell					
112	dd	122	64	34	168	
113	ddee					
114	ddff	136	66	29	157	
115	ddgg	128	70	34	188	
116	ddhh	118	64	33	153	
117	ddii	125	67	32	152	
118	ddjj	114	64	30	135	
119	ddkk					
120	dlll					
121	ee	128	66	30	138	
122	eeff					
123	eeff	125	62	32	148	
124	eehh	111	59	32	129	
125	eeii	113	59	30	125	

NUMBER	CODE	LENGTH	HEIGHT	WIDTE	WEIGHT	REMARKS
126	eejj	1100	54	27	84	
127	eekk	112	59	27	105	
128	eell					
129	ff	131	73	38	247	
130	ffgg	128	76	42	292	
131	ffhh					
132	ffii					
133	ffjj	99	54	25	73	
134	ffkk					
135	ffll	108	56	28	98	
136	ff	107	55	27	91	
137	ffhh	116	60	27	104	
138	ffii	139	75	39	268	
139	ffjj					
140	ffkk	124	65	35	197	
141	ffll	121	66	38	191	
142	hh					
143	hhii	103	49	26	71	
144	hhjj					
145	hhkk					
146	hhll					
147	ii	130	69	37	193	
148	iijj					
149	iikk	118	63	31	131	
150	ii ll	112	59	30	114	
151	jj					
152	jjkk					
153	jjll					
154	kk	128	63	32	155	
155	kkll	124	66	33	165	
156	ll					
157	abb	113	61	33	147	
158	acc	120	63	34	175	
159	add					
160	eee					
161	aff	131	69	33	198	
162	agg	128	73	37	219	
163	ahh	134	73	33	196	
164	aii					
165	ajj	132	70	30	151	
166	akk	137	67	34	168	
167	all	127	68	35	206	
168	baa					
169	bcc					
170	bdd	119	70	33	166	

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
171	bee	113	61	30	130	
172	bff					
173	bff					
174	bhh					
175	bii	131	63	39	106	
176	bjj	98	49	29	62	
177	bkk	101	54	24	72	
178	bll					
179	caa	117	57	28	110	
180	cbb					
181	cdd					
182	cee					
183	cff					
184	cff	113	59	30	131	
185	chh					
186	cii					
187	cjj	129	64	35	195	
188	ckk	127	71	39	245	
189	cll	123	67	38	205	
190	daa					
191	dbb	128	66	35	191	
192	dec	131	65	36	dead	
193	dec	130	67	31	161	
194	dff					
195	dgg	116	66	34	166	
196	dhh					
197	dii					
198	djj	114	67	29	143	
199	dkk	117	65	27	121	
200	dll	121	64	30	133	

RECLAIMED FROM VINCENT LAKE, AUGUST 3, 1944

MEASURED FOR LENGTH, HEIGHT, WIDTH, AND WEIGHT

RETURNED TO VINCENT LAKE, AUGUST 3, 1944

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
1	a	130	70	35	206	
2	ab	90	47	23	54	
3	ac	125	69	36	209	
4	ad	125	67	35	172	
5	ae	137	70	43	259	
6	af	121	66	35	181	
7	ag	107	56	25	82	
8	ah	109	58	33	145	
9	ai	139	72	43	274	
10	aj	123	64	34	173	
11	ak	128	69	43	261	
12	al	135	68	39	232	
13	b	97	51	22	651	
14	bc	120	69	35	187	
15	bd	95	48	24	59	
16	be	124	63	40	210	
17	bf	118	61	30	121	
18	bg	136	70	39	241	
19	bh	100	53	26	77	
20	bi	128	70	30	152	
21	bj	139	71	39	276	
22	bk	119	64	31	140	
23	bl	121	66	27	127	
24	c	114	58	30	110	buried above water
25	cd	122	61	32	dead	died on land
26	ce	124	67	32	171	
27	cf	126	65	31	150	
28	cg	120	63	34	157	
29	ch	131	66	36	211	
30	ci	110	60	31	dead	in water
31	cj	138	73	39	248	
32	ck	117	66	34	171	
33	cl	120	63	38	dead	died on land
34	d	118	66	35	182	
35	de	115	67	35	178	

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
36	df	128	78	30	214	
37	dg	102	61	30	123	
38	dh	128	72	37	226	
39	di	128	67	33	163	
40	dj	128	68	31	148	
41	dk	128	49	31	130	
42	dl	124	68	36	205	
43	e	120	65	35	178	
44	ef	131	63	29	136	
45	eg	101	49	23	62	
46	eh	114	55	27	86	
47	ei	111	57	30	103	
48	ej	118	63	35	164	
49	ek	111	64	36	dead	died on land
50	el	118	62	30	123	
51	f	129	71	38	231	buried above water
52	fg	125	62	40	227	
53	fh					
54	fi	103	50	25	68	
55	fj	110	58	25	88	
56	fk	119	67	33	189	
57	fl	116	59	32	149	
58	g	119	64	34	157	
59	gh	109	57	32	140	
60	gi	124	65	36	189	buried above water
61	gj	116	64	36	dead	died on land
62	gk	118	68	33	174	
63	gl	101	55	32	122	
64	h	120	63	31	137	buried above water
65	hi	112	64	33	148	
66	hj	123	65	39	205	
67	hk	105	55	25	76	
68	hl	125	70	35	201	
69	i	120	64	34	168	
70	ij	117	64	33	146	
71	ik	123	72	36	213	
72	il	133	71	35	210	
73	j	124	74	34	dead	in water
74	jk	997	50	24	64	
75	jl	121	66	38	dead	died on land
76	k	111	56	29	105	
77	kl	135	71	37	225	
78	l	93	50	24	56	
79	aa	116	59	32	126	
80	aabb	125	66	32	143	

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
81	aacc	119	63	37	193	
82	aadd	129	67	36	211	
83	aaee	115	64	35	151	
84	aaff	112	61	32	142	
85	aagg	102	54	29	94	
86	aahh	123	66	37	208	
87	aaii	115	63	33	136	
88	ajjj	135	69	36	225	
89	aakk	134	70	35	191	buried above water
90	aall	116	60	30	116	
91	abb	122	67	36	189	
92	bbee	119	65	37	203	
93	bbdd	125	66	30	147	
94	bbee	116	69	31	116	
95	bbff	131	73	32	179	
96	bbgg	110	54	27	90	
97	bbhh	134	70	36	206	
98	bbii	128	67	35	190	
99	bbjj	128	64	32	162	
100	bbkk					
101	bbll	117	64	31	136	
102	cc					
103	ccdd	124	66	33	dead	died on land
104	ccce	140	67	39	221	
105	ccff	132	72	36	224	
106	ccgg	120	64	34	181	
107	cchh	125	69	41	232	
108	ccii	120	66	32	153	
109	ccjj					
110	cckk	123	62	34	dead	died on land
111	ccll	138	71	37	229	
112	dd	124	68	38	197	
113	ddee	141	72	41	238	
114	ddff	126	69	38	dead	died on land
115	ddgg	111	62	30	136	
116	ddhh	106	56	31	114	
117	ddii	141	69	35	205	
118	ddjj	145	76	40	282	
119	ddkk	111	58	30	117	
120	ddll	126	63	30	dead	died on land
121	ee	128	66	31	138	
122	eeff	124	66	33	158	
123	eegg	123	66	33	153	
124	eehh	132	69	40	246	
125	eeii	110	55	29	dead	died on land

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
126	eejj	130	66	33	175	
127	eekk	134	73	38	240	
128	eell	124	65	34	160	
129	ff	126	62	30	136	
130	ffgg	125	62	32	149	
131	ffhh	123	70	37	209	buried above water
132	ffii					
133	ffjj	132	64	30	138	
134	ffkk	122	59	32	142	
135	ffll	128	69	36	181	
136	gg	139	77	39	280	
137	gghh	133	62	30	138	
138	giii	130	68	32	dead	died on land
139	gjjj	125	66	30	144	
140	gkkk	109	61	26	103	
141	glll	122	62	34	153	
142	hh	134	68	34	184	
143	hhii	133	66	37	189	
144	hhjj	123	67	36	193	
145	hhkk	117	61	31	128	
146	hhll	130	70	37	dead	died on land
147	ii	119	59	30	123	
148	iijj	124	69	36	200	
149	iikk	132	68	35	192	
150	ii ll	129	66	33	172	
151	jj	113	58	30	121	
152	jjkk	115	54	27	100	
153	jjll	106	58	25	93	
154	kk	135	70	38	220	
155	kkll	110	56	30	107	
156	ll	127	71	32	165	
157	abb	127	70	38	212	
158	acc					
159	add	128	69	32	163	
160	eee	118	64	32	150	
161	aff	142	77	37	243	
162	agg	120	65	34	170	
163	ahh	118	59	31	118	
164	aii	121	66	33	170	
165	ajj	99	54	24	68	
166	akk	124	66	30	dead	died on land
167	all	119	63	29	131	
168	baa	130	70	31	dead	died on land
169	bcc	136	71	33	194	
170	bdd	137	74	42	302	

NUMBER	CODE	LENGTH	HEIGHT	WIDTH	WEIGHT	REMARKS
171	bee	135	67	36	204	
172	bff	120	64	37	202	
173	bgg	134	66	35	204	
174	bhh	131	71	38	241	
175	bii	122	63	28	122	
176	bjj	116	62	29	128	
177	bkk	114	58	28	104	
178	bll	116	60	30	130	
179	caa	131	71	39	249	
180	cbb	122	60	31	127	
181	cdd	138	71	32	dead	died on land
182	cee	109	52	29	104	
183	cff	128	70	35	184	
184	ceg	120	61	32	159	
185	chh	122	65	31	151	
186	cii					
187	cjj	118	61	27	dead	died on land
188	ckk	116	59	33	132	
189	cll	130	60	32	148	
190	daa	125	63	29	125	
191	dbb	140	72	41	dead	died on land
192	dcc	135	70	39	dead	died on land
193	dee	130	65	38	dead	died on land
194	dff	133	67	32	160	
195	dgg	121	62	-	dead	died on land
196	dhh	116	58	28	106	
197	dii	119	61	30	130	
198	djj	125	67	25	125	
199	dkk	118	67	40	dead	in water
200	dll	104	54	27	91	