

# Appendix 1

## SURVIVORSHIP DATA FOR ADULT FEMALE BROWN KIWI

Survivorship data and calculations of simple survivorship measures from radio-tagged adult female brown kiwi in central Northland, New Zealand (see Robertson et al. (1999) for details of the study).

The dataset includes each individual's band number (Band), band colour combination (Comb) and sex (M: male; F: female); the study area in which the individual was located (Area: P = Purua; Rp = Riponui; H = Hodge's; Rr = Rarewarewa); the most recent transmitter frequency used for the animal (Tx); the date on which the continuous record of radio-tracking started (On) and finished (Off\_last), and the total tracking period (Total); and the fate of the bird (Death: 0 = alive; 1 = dead) and cause of death (Cause), if applicable.

Ongoing records are presented in bold and records ending with death of the individual are in italics; all other records ended due to transmitter removal or failure, and are presented in normal font. For further information about this data, see section 4.

Band	Comb	Sex	Area	Tx	On	Off_last	Total	Death	Cause
1079	B	F	P	37	29-Jun-94	10-Mar-95	254	0	
1086	BY	F	P	9	22-Aug-94	12-Apr-95	233	0	
1078	R	F	P	52	22-Aug-94	27-Oct-94	66	0	
1087	YW	F	P	5	22-Aug-94	1-Dec-94	101	0	
1088	YG	F	P	36	24-Aug-94	19-Oct-94	56	0	
46324	RG	F	P	39	10-Mar-95	30-May-95	81	0	
1094	RY	F	P	55	12-Mar-95	11-May-95	60	0	
1005	GO	F	P	5	21-Nov-95	19-Sep-96	303	0	
<b>1078</b>	<b>R</b>	<b>F</b>	<b>P</b>	<b>48</b>	<b>12-Dec-97</b>	<b>21-Sep-98</b>	<b>283</b>	<b>0</b>	
1071	RW	F	Rp	50	8-Jun-94	7-Jul-94	29	0	
1082	BW	F	Rp	50	20-Jul-94	15-Dec-94	148	0	
1083	W	F	Rp	67	26-Jul-94	13-Sep-94	49	0	
1071	RW	F	Rp	36	20-Oct-95	15-Jan-96	87	0	
1069	B	F	Rp	82	17-Sep-96	27-Nov-96	71	0	
<b>951</b>	<b>YB</b>	<b>F</b>	<b>Rp</b>	<b>71</b>	<b>22-Jul-97</b>	<b>25-Sep-98</b>	<b>430</b>	<b>0</b>	
953	YBY	F	Rp	10	24-Dec-97	25-Sep-98	275	0	
1083	W	F	Rp	65	18-Oct-97	22-Oct-97	4	0	
1001	WO	F	H	25	26-May-95	31-May-95	5	0	
1004	BO	F	H	50	20-Sep-95	20-Dec-95	91	0	
1012	O	F	H	16	17-May-96	18-Jun-96	32	0	
44912	B	F	H	82	25-Jun-96	27-Feb-97	247	0	
1015	BR	F	H	17	22-Aug-96	23-Dec-96	123	0	
44917	G	F	H	72	18-Apr-97	13-Mar-98	329	0	
1012	O	F	H	28	26-Apr-97	6-Oct-97	163	0	
<i>1004</i>	<i>BO</i>	<i>F</i>	<i>H</i>	<i>69</i>	<i>16-Jul-97</i>	<i>6-Oct-97</i>	<i>82</i>	<i>1</i>	<i>Unknown</i>
1092	RW	F	H	25	24-Sep-97	12-Mar-98	169	0	

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Band	Comb	Sex	Area	Tx	On	Off_last	Total	Death	Cause
1092	RW	F	H	30	28-Apr-97	11-Jun-97	44	0	
1012	O	F	H	14	17-Nov-97	17-Jun-98	212	0	
35022	Y	F	Rr	20	2-Jan-94	19-May-94	137	0	
35023	G	F	Rr	26	3-Jan-94	3-Jun-94	151	0	
35025	O	F	Rr	18	3-Jan-94	24-May-94	141	0	
35022	Y	F	Rr	37	19-May-94	27-Jun-94	39	0	
44966	WG	F	Rr	77	20-May-94	25-Jun-94	36	0	
1064	BR	F	Rr	34	24-May-94	23-Jun-94	30	0	
35025	O	F	Rr	52	15-Jun-94	3-Aug-94	49	0	
1072	G	F	Rr	21	21-Jun-94	22-Jun-94	1	0	
1073	OB	F	Rr	58	21-Jun-94	8-Oct-94	109	0	
<b>47365</b>	<b>G</b>	<b>F</b>	<b>Rr</b>	<b>31</b>	<b>22-Jun-94</b>	<b>24-Sep-98</b>	<b>1555</b>	<b>0</b>	
1075	WR	F	Rr	17	23-Jun-94	26-Jun-94	3	0	
1076	WY	F	Rr	61	25-Jun-94	24-Aug-94	60	0	
1077	BW	F	Rr	77	26-Jun-94	25-Jul-94	29	0	
1084	GR	F	Rr	77	27-Jul-94	21-Dec-94	147	0	
1076	WY	F	Rr	34	28-Sep-94	19-Apr-95	203	0	
47368	RY	F	Rr	52	31-Oct-94	25-Nov-94	25	0	
<b>1072</b>	<b>GO</b>	<b>F</b>	<b>Rr</b>	<b>62</b>	<b>11-Mar-95</b>	<b>3-Jul-98</b>	<b>1210</b>	<b>0</b>	
1065	R	F	Rr	16	6-Mar-95	24-Aug-98	1267	1	Dog
<b>1062</b>	<b>RW</b>	<b>F</b>	<b>Rr</b>	<b>49</b>	<b>3-Mar-95</b>	<b>14-Sep-98</b>	<b>1291</b>	<b>0</b>	
1073	RG	F	Rr	12	1-Mar-95	28-Jul-95	149	0	
<b>1064</b>	<b>BR</b>	<b>F</b>	<b>Rr</b>	<b>16</b>	<b>11-Mar-95</b>	<b>10-Sep-98</b>	<b>1279</b>	<b>0</b>	
949	YR	F	Rr	63	1-Mar-95	11-Sep-98	1290	0	
<b>1075</b>	<b>WR</b>	<b>F</b>	<b>Rr</b>	<b>66</b>	<b>11-Mar-95</b>	<b>24-Sep-98</b>	<b>1293</b>	<b>0</b>	
35025	O	F	Rr	80	16-Mar-95	12-Dec-96	637	0	
<b>46329</b>	<b>YW</b>	<b>F</b>	<b>Rr</b>	<b>34</b>	<b>27-Apr-95</b>	<b>31-Aug-98</b>	<b>1222</b>	<b>0</b>	
<b>1061</b>	<b>BY</b>	<b>F</b>	<b>Rr</b>	<b>71</b>	<b>28-Apr-95</b>	<b>7-Sep-98</b>	<b>1228</b>	<b>0</b>	
<b>1095</b>	<b>RB</b>	<b>F</b>	<b>Rr</b>	<b>13</b>	<b>29-Apr-95</b>	<b>14-Sep-98</b>	<b>1234</b>	<b>0</b>	
44901	GY	F	Rr	28	23-Nov-95	8-May-96	167	0	
1099	OBO	F	Rr	77	13-May-96	7-Jun-96	25	0	
<b>1084</b>	<b>GR</b>	<b>F</b>	<b>Rr</b>	<b>72</b>	<b>5-Aug-96</b>	<b>24-Sep-98</b>	<b>780</b>	<b>0</b>	
931	YGY	F	Rr	41	16-Aug-96	1-May-98	623	0	
<b>35025</b>	<b>O</b>	<b>F</b>	<b>Rr</b>	<b>52</b>	<b>20-May-97</b>	<b>24-Sep-98</b>	<b>492</b>	<b>0</b>	
44970	O	M	P	69	25-May-94	8-Sep-95	471	0	
<b>44971</b>	<b>Y</b>	<b>M</b>	<b>P</b>	<b>55</b>	<b>25-May-94</b>	<b>21-Sep-98</b>	<b>1580</b>	<b>0</b>	
<b>44972</b>	<b>G</b>	<b>M</b>	<b>P</b>	<b>31</b>	<b>25-May-94</b>	<b>21-Sep-98</b>	<b>1580</b>	<b>0</b>	
<b>35027</b>	<b>R</b>	<b>M</b>	<b>P</b>	<b>32</b>	<b>28-Jun-94</b>	<b>21-Sep-98</b>	<b>1546</b>	<b>0</b>	
44905	RW	M	P	34	22-Aug-94	21-Jun-96	669	0	
<b>47377</b>	<b>OG</b>	<b>M</b>	<b>P</b>	<b>32</b>	<b>24-Sep-94</b>	<b>7-Apr-95</b>	<b>195</b>	<b>0</b>	
<b>44911</b>	<b>WG</b>	<b>M</b>	<b>P</b>	<b>58</b>	<b>24-Sep-94</b>	<b>23-Sep-98</b>	<b>1460</b>	<b>0</b>	
<b>35029</b>	<b>YG</b>	<b>M</b>	<b>P</b>	<b>54</b>	<b>19-Oct-94</b>	<b>21-Sep-98</b>	<b>1433</b>	<b>0</b>	
1091	YW	M	P	66	1-Dec-94	7-May-96	523	1	Ferret
<b>46322</b>	<b>B</b>	<b>M</b>	<b>P</b>	<b>47</b>	<b>10-Mar-95</b>	<b>21-Sep-98</b>	<b>1291</b>	<b>0</b>	
46323	W	M	P	36	10-Mar-95	17-Oct-95	221	0	
<b>46325</b>	<b>BW</b>	<b>M</b>	<b>P</b>	<b>46</b>	<b>10-Mar-95</b>	<b>23-Sep-98</b>	<b>1293</b>	<b>0</b>	
<b>44927</b>	<b>BO</b>	<b>M</b>	<b>P</b>	<b>62</b>	<b>12-Mar-95</b>	<b>18-Sep-98</b>	<b>1286</b>	<b>0</b>	
<b>46327</b>	<b>BY</b>	<b>M</b>	<b>P</b>	<b>30</b>	<b>12-Apr-95</b>	<b>21-Sep-98</b>	<b>1258</b>	<b>0</b>	
44941	RY	M	P	55	11-May-95	19-Apr-96	344	0	
44947	GR	M	P	9	23-Jan-96	23-Sep-98	974	0	
<b>47468</b>	<b>GO</b>	<b>M</b>	<b>P</b>	<b>19</b>	<b>19-Sep-96</b>	<b>21-Sep-98</b>	<b>732</b>	<b>0</b>	

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## Appendix 1—continued

Band	Comb	Sex	Area	Tx	On	Off_last	Total	Death	Cause
47481	S/S	M	P	81	18-May-98	23-Sep-98	128	0	
45925	S/S	M	P	34	18-May-98	17-Sep-98	122	0	
1067	YO	M	Rp	26	26-May-94	25-Sep-98	1583	0	
44974	G	M	Rp	67	26-May-94	25-Sep-98	1583	0	
44975	R	M	Rp	54	26-May-94	21-Oct-94	148	0	
44976	O	M	Rp	80	27-May-94	1-Apr-98	1405	0	
44977	B	M	Rp	32	27-May-94	10-May-95	348	1	Unknown
44978	RW	M	Rp	77	27-May-94	25-Sep-98	1582	0	
44907	BW	M	Rp	40	23-Aug-94	25-Sep-98	1494	0	
44904	WO	M	Rp	74	19-Aug-94	28-Sep-98	1501	0	
44908	W	M	Rp	86	13-Sep-94	28-Sep-98	1476	0	
44903	YB	M	Rp	36	18-Aug-94	25-Sep-98	1499	0	
44910	BY	M	Rp	54	21-Oct-94	9-Dec-94	49	1	Unknown
34167	RB	M	Rp	60	16-Oct-97	28-Sep-98	347	0	
44914	Y	M	H	3	25-Sep-94	29-Sep-98	1465	0	
44921	BW	M	H	17	26-Sep-94	1-Sep-98	1436	0	
44920	RW	M	H	32	23-Jan-95	27-Sep-96	613	1	Ferret
47451	YB	M	H	65	25-May-95	29-Sep-98	1223	0	
47452	RG	M	H	12	26-May-95	8-Aug-95	74	0	
44953	YO	M	H	31	27-May-95	15-Oct-96	507	1	Ferret
44916	G	M	H	47	27-May-95	8-Aug-96	439	1	Ferret
47454	RY	M	H	49	27-May-95	13-Aug-95	78	0	
47457	YG	M	H	27	29-May-95	7-Aug-95	70	0	
47458	GR	M	H	64	30-May-95	29-Sep-98	1218	0	
47459	BO	M	H	18	31-May-95	7-Sep-95	99	0	
44918	R	M	H	44	31-May-95	1-Sep-98	1189	1	Possum
47459	BO	M	H	62	20-Dec-95	8-Jan-98	750	0	
47463	O	M	H	70	18-Jun-96	29-Sep-98	833	0	
47457	YG	M	H	37	22-Aug-96	29-Sep-98	768	0	
43485	ROYG	M	H	47	4-Dec-96	29-Sep-98	664	0	
47459	BO	M	H	79	20-May-98	29-Sep-98	132	0	
47454	RY	M	H	14	17-Jun-98	29-Sep-98	104	0	
35024	O	M	Rr	1	3-Jan-94	3-Jan-94	0	0	
44962	W	M	Rr	33	19-May-94	24-Sep-98	1589	0	
44963	B	M	Rr	30	19-May-94	24-Sep-98	1589	0	
44964	RW	M	Rr	57	20-May-94	24-Sep-98	1588	0	
44965	BY	M	Rr	46	20-May-94	27-Jun-94	38	0	
44967	O	M	Rr	50	24-May-94	24-Sep-98	1584	0	
44968	R	M	Rr	29	24-May-94	7-Sep-98	1567	0	
44979	WO	M	Rr	67	21-Jun-94	29-Jun-94	8	0	
44980	GO	M	Rr	79	22-Jun-94	18-Feb-96	606	0	
44981	BR	M	Rr	85	22-Jun-94	24-Sep-98	1555	0	
47366	G	M	Rr	7	22-Jun-94	6-Dec-96	898	1	Drowned
47367	YR	M	Rr	85	23-Jun-94	21-Feb-96	608	1	Unknown
44983	GW	M	Rr	74	24-Jun-94	19-Aug-96	787	1	Dog / Ferret
47369	RY	M	Rr	77	24-Jun-94	28-Sep-98	1557	0	
44984	RO	M	Rr	78	25-Jun-94	24-Sep-98	1552	0	
44987	YO	M	Rr	39	25-Jun-94	11-Sep-98	1539	0	
47370	WY	M	Rr	34	26-Jun-94	16-Aug-94	51	0	
44988	WR	M	Rr	15	26-Jun-94	11-Feb-98	1326	0	
44989	GB	M	Rr	27	26-Jun-94	24-Sep-98	1551	0	

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Band	Comb	Sex	Area	Tx	On	Off_last	Total	Death	Cause
44990	BW	M	Rr	59	6-Jul-94	24-Sep-98	1541	0	
44909	OB	M	Rr	58	8-Oct-94	29-Aug-95	325	0	
47370	G	M	Rr	53	19-Apr-95	24-Sep-98	1254	0	
46328	YW	M	Rr	70	27-Apr-95	22-Jan-96	270	1	Unknown
47373	YG	M	Rr	21	29-Apr-95	7-Sep-98	1227	0	
44928	RB	M	Rr	11	29-Apr-95	14-Sep-98	1234	0	
44929	OR	M	Rr	23	4-May-95	30-Aug-95	118	0	
46330	OG	M	Rr	18	5-May-95	24-Sep-98	1238	0	
47460	RG	M	Rr	5	11-Jul-95	24-Sep-98	1171	0	
47462	GY	M	Rr	15	8-May-96	24-Sep-98	869	0	
47465	GWB	M	Rr	73	16-May-96	11-Sep-98	848	0	
44980	YB	M	Rr	75	25-Jun-96	24-Sep-98	821	0	
47474	YW	M	Rr	24	21-Mar-97	24-Sep-98	552	0	
34169	S/S	M	Rr	65	23-Oct-97	3-Mar-98	131	0	
44988	WR	M	Rr	35	11-May-98	24-Sep-98	136	0	
47487	YGY	M	Rr	83	16-Jun-98	28-Sep-98	104	0	
47488	S/S	M	Rr	25	3-Sep-98	10-Sep-98	7	0	
<b>Total:</b>							94551	days	
							258.87	years	
							13	deaths	
<b>Estimates based on the assumption of constant survival:</b>									
							survival rate	0.9498	(= 1 - (deaths/years))
							mortality rate	0.0502	
							life expectancy	19.9128	years/deaths

# Appendix 2

## SURVIVORSHIP DATA FOR BROWN KIWI CHICKS

Survivorship data for brown kiwi chicks exposed to brodifacoum poison (Poison) and in nearby untreated forest patches (Non-treatment) in 1996-98 (see Robertson et al. (1999) for more details). The data have been sorted by tracking interval.

The dataset includes each individual's band number (Band) and transmitter frequency (Tx); the study area in which it was located (Area) and the management regime for that area (Treatment: Poison = treated with brodifacoum poison; Non-treatment = untreated); the date on which the continuous record of radio-tracking started (On) and finished (Off\_last), and the total tracking period (Cdays); and the fate of the bird (Death?: 0 = alive; 1 = dead). Records ending with death of the individual are presented in italics. For further information about this data, see section 5.3.

Band	Tx	Area	Treatment	On	Off_last	Cdays	Death?
<i>FRI5304</i>	97	<i>P</i>	<i>Non-treatment</i>	<i>22-Feb-97</i>	<i>25-Feb-97</i>	<i>3</i>	<i>1</i>
<i>393F</i>	25	<i>P</i>	<i>Non-treatment</i>	<i>10-Oct-97</i>	<i>14-Oct-97</i>	<i>4</i>	<i>1</i>
<i>FRI1989</i>	76	<i>Rp</i>	<i>Poison</i>	<i>15-Oct-97</i>	<i>19-Oct-97</i>	<i>4</i>	<i>1</i>
<i>C13</i>	23	<i>P</i>	<i>Non-treatment</i>	<i>9-Feb-97</i>	<i>17-Feb-97</i>	<i>8</i>	<i>1</i>
<i>C9</i>	12	<i>P</i>	<i>Non-treatment</i>	<i>19-Sep-96</i>	<i>27-Sep-96</i>	<i>8</i>	<i>1</i>
<i>C10</i>	12	<i>P</i>	<i>Non-treatment</i>	<i>9-Oct-96</i>	<i>19-Oct-96</i>	<i>10</i>	<i>1</i>
<i>C11</i>	25	<i>P</i>	<i>Non-treatment</i>	<i>11-Oct-96</i>	<i>21-Oct-96</i>	<i>10</i>	<i>0</i>
<i>399F</i>	91	<i>Rr</i>	<i>Poison</i>	<i>17-Oct-97</i>	<i>29-Oct-97</i>	<i>12</i>	<i>1</i>
<i>387F</i>	27	<i>P</i>	<i>Non-treatment</i>	<i>26-Sep-97</i>	<i>10-Oct-97</i>	<i>14</i>	<i>1</i>
<i>C11</i>	27	<i>Rr</i>	<i>Poison</i>	<i>18-Oct-96</i>	<i>1-Nov-96</i>	<i>14</i>	<i>1</i>
<i>386F</i>	37	<i>P</i>	<i>Non-treatment</i>	<i>12-Sep-97</i>	<i>27-Sep-97</i>	<i>15</i>	<i>1</i>
<i>B0884</i>	74	<i>Rr</i>	<i>Poison</i>	<i>13-Jan-98</i>	<i>28-Jan-98</i>	<i>15</i>	<i>1</i>
<i>363F</i>	96	<i>Rr</i>	<i>Poison</i>	<i>21-Oct-96</i>	<i>6-Nov-96</i>	<i>16</i>	<i>1</i>
<i>C12</i>	29	<i>P</i>	<i>Non-treatment</i>	<i>11-Oct-96</i>	<i>27-Oct-96</i>	<i>16</i>	<i>1</i>
<i>C8</i>	40	<i>Rp</i>	<i>Poison</i>	<i>24-Dec-97</i>	<i>9-Jan-98</i>	<i>16</i>	<i>0</i>
<i>366F</i>	45	<i>Rr</i>	<i>Poison</i>	<i>18-Oct-96</i>	<i>4-Nov-96</i>	<i>17</i>	<i>0</i>
<i>387F</i>	91	<i>Rr</i>	<i>Poison</i>	<i>22-Sep-97</i>	<i>9-Oct-97</i>	<i>17</i>	<i>1</i>
<i>C14</i>	37	<i>Rr</i>	<i>Poison</i>	<i>22-Oct-96</i>	<i>9-Nov-96</i>	<i>18</i>	<i>1</i>
<i>FRI1988</i>	74	<i>Rp</i>	<i>Poison</i>	<i>14-Oct-97</i>	<i>1-Nov-97</i>	<i>18</i>	<i>1</i>
<i>C7</i>	33	<i>Rp</i>	<i>Poison</i>	<i>19-Dec-97</i>	<i>9-Jan-98</i>	<i>21</i>	<i>0</i>
<i>FRI5303</i>	94	<i>P</i>	<i>Non-treatment</i>	<i>14-Feb-97</i>	<i>7-Mar-97</i>	<i>21</i>	<i>1</i>
<i>Huia</i>	95	<i>Rr</i>	<i>Poison</i>	<i>7-Jan-97</i>	<i>28-Jan-97</i>	<i>21</i>	<i>0</i>
<i>396F</i>	35	<i>Rr</i>	<i>Poison</i>	<i>17-Sep-97</i>	<i>9-Oct-97</i>	<i>22</i>	<i>1</i>
<i>c15</i>	96	<i>Rr</i>	<i>Poison</i>	<i>5-Sep-97</i>	<i>27-Sep-97</i>	<i>22</i>	<i>0</i>
<i>B-0894</i>	29	<i>Rp</i>	<i>Poison</i>	<i>31-Mar-98</i>	<i>23-Apr-98</i>	<i>23</i>	<i>1</i>
<i>C18</i>	91	<i>Rr</i>	<i>Poison</i>	<i>16-Feb-98</i>	<i>14-Mar-98</i>	<i>26</i>	<i>0</i>
<i>395f</i>	29	<i>P</i>	<i>Non-treatment</i>	<i>26-Sep-97</i>	<i>27-Oct-97</i>	<i>31</i>	<i>1</i>
<i>FRI1990</i>	79	<i>Rp</i>	<i>Poison</i>	<i>3-Oct-97</i>	<i>3-Nov-97</i>	<i>31</i>	<i>1</i>

*Continued on next page*

Appendix 2—continued

Band	Tx	Area	Treatment	On	Off_last	Cdays	Death?
C17	90	Rr	Poison	15-Oct-97	16-Nov-97	32	0
372F	31	P	Non-treatment	14-Oct-96	17-Nov-96	34	1
400F	95	Rr	Poison	17-Oct-97	20-Nov-97	34	0
B0879	94	Rr	Poison	23-Dec-97	27-Jan-98	35	1
B0876	91	P	Non-treatment	18-Nov-97	25-Dec-97	37	1
B0885	36	P	Non-treatment	28-Jan-98	7-Mar-98	38	0
C8	36	P	Non-treatment	19-Sep-96	28-Oct-96	39	1
C13	27	Rr	Poison	21-Oct-96	7-Dec-96	47	0
398F	94	Rr	Poison	24-Sep-97	14-Nov-97	51	1
394F	40	P	Non-treatment	26-Sep-97	17-Nov-97	52	1
C9	40	Rp	Poison	3-Feb-98	28-Mar-98	53	1
397F	45	P	Non-treatment	26-Sep-97	30-Nov-97	65	0
B0880	25	Rr	Poison	23-Dec-97	1-Mar-98	68	0
FRI5307	31	Rr	Poison	24-Sep-97	3-Dec-97	70	0
367F	88	Rr	Poison	24-Oct-96	4-Jan-97	72	0
382F	27	Rr	Poison	6-Jan-97	20-Mar-97	73	0
376F	17	Rr	Poison	18-Oct-96	2-Jan-97	76	0
392F	97	Rr	Poison	17-Oct-97	5-Jan-98	80	1
47476 *	90	Rr	Poison	18-Sep-96	23-Dec-96	96	0
B0877	90	Rr	Poison	5-Dec-97	21-Mar-98	106	1
377F	96	Rr	Poison	14-Nov-96	6-Mar-97	112	1
384F	94	Rr	Poison	17-Mar-97	14-Jul-97	119	1
FRI5306	17	Rr	Poison	17-Sep-97	23-Jan-98	128	1
388F	35	Rr	Poison	17-Sep-97	25-Feb-98	161	0
385F	35	H	Non-treatment	2-May-97	21-Oct-97	172	0
371F	91	Rr	Poison	21-Oct-96	14-Apr-97	175	1
FRI5308	88	Rr	Poison	17-Oct-97	17-May-98	180	0
47478	29	Rr	Poison	13-Nov-96	1-Oct-97	180	0
47477	12	Rr	Poison	12-Sep-96	3-Sep-97	180	0

\* A second record of chick 47476 was not included as it was already over 180 days old when recaptured.

# Appendix 3

## CALCULATION OF KAPLAN-MEIER ESTIMATES AND 95% CONFIDENCE INTERVALS

Excel spreadsheets used for deriving Kaplan-Meier estimates (Table A3.1) and 95% confidence intervals (Table A3.2) for the survival of brown kiwi chicks in treated (poison) and non-treated (Non-treat) areas. The raw data are given in Appendix 2. Calculations are outlined in section 5.3.2.

TABLE A3.1. EXCEL SPREADSHEET USED FOR DERIVING KAPLAN-MEIER ESTIMATES OF SURVIVAL OF BROWN KIWI CHICKS, WITH CHART.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1																	
2																	
3	Count of Band	Treatment	Death?														
4		Non-treat		Non-treat Total	Poison	Poison Total	Grand Total	Day	At risk	Empirical death rate	Empirical survival rate	Non-treatment	At risk	Empirical death rate	Empirical survival rate	At risk	Empirical survival rate
5	Cdays	0	1		0	1		0	1			1	1			1	
6	3	1	1	1			1	3	18	0.0556	0.9444	0.9444	0.9444	39	0.0000	1.0000	1.0000
7	4	1	1	1		1	1	4	17	0.0588	0.9412	0.8889	0.8889	39	0.0256	0.9744	0.9744
8	8	2	2	2			2	8	16	0.1250	0.8750	0.7778	0.7778	38	0.0000	1.0000	1.0000
9	10	1	1	2			2	10	14	0.0714	0.9286	0.7222	0.7222	38	0.0000	1.0000	1.0000
10	12					1	1	12	12	0.0000	1.0000	0.7222	0.7222	38	0.0263	0.9737	0.9487
11	14	1	1	1		1	1	14	12	0.0833	0.9167	0.6620	0.6620	37	0.0270	0.9730	0.9231
12	15	1	1	1		1	1	15	11	0.0909	0.9091	0.6019	0.6019	36	0.0278	0.9722	0.8974
13	16	1	1	1		1	2	16	10	0.1000	0.9000	0.5417	0.5417	35	0.0286	0.9714	0.8718
14	17					1	2	17	9	0.0000	1.0000	0.5417	0.5417	33	0.0303	0.9697	0.8454
15	18					2	2	18	9	0.0000	1.0000	0.5417	0.5417	31	0.0645	0.9355	0.7908
16	21	1	1	1		2	3	21	9	0.1111	0.8889	0.4815	0.4815	29	0.0000	1.0000	0.7908
17	22					1	2	22	8	0.0000	1.0000	0.4815	0.4815	27	0.0370	0.9630	0.7615
18	23					1	1	23	8	0.0000	1.0000	0.4815	0.4815	25	0.0400	0.9600	0.7311
19	26					1	1	26	8	0.0000	1.0000	0.4815	0.4815	24	0.0000	1.0000	0.7311
20	31	1	1	1		1	1	31	8	0.1250	0.8750	0.4213	0.4213	23	0.0436	0.9565	0.6993
21	32					1	1	32	7	0.0000	1.0000	0.4213	0.4213	22	0.0000	1.0000	0.6993
22	34	1	1	1		1	1	34	7	0.1429	0.8571	0.3611	0.3611	21	0.0000	1.0000	0.6993
23	35					1	1	35	6	0.0000	1.0000	0.3611	0.3611	20	0.0500	0.9500	0.6643
24	37	1	1	1		1	1	37	6	0.1667	0.8333	0.3009	0.3009	19	0.0000	1.0000	0.6643
25	38					1	1	38	5	0.0000	1.0000	0.3009	0.3009	19	0.0000	1.0000	0.6643
26	39	1	1	1		1	1	39	4	0.2500	0.7500	0.2257	0.2257	19	0.0000	1.0000	0.6643
27	47					1	1	47	3	0.0000	1.0000	0.2257	0.2257	19	0.0000	1.0000	0.6643

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Table A3.1—continued

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1																	
2																	
3	Count of Band	Treatment	Death?														
4		Non-treat		Non-treat Total	Poison		Poison Total	Grand Total	Day	At risk	Empirical death rate	Empirical survival rate	Non-treatment	At risk	Empirical death rate	Empirical survival rate	KM survival rate
5	Cdays	0	1		0	1			0					1			
28	51					1	1	1	51	3	0.0000	1.0000	0.2257	18	0.0556	0.9444	0.6274
29	52		1	1					52	3	0.3333	0.6667	0.1505	17	0.0000	1.0000	0.6274
30	53				1	1	1	1	53	2	0.0000	1.0000	0.1505	17	0.0588	0.9412	0.5905
31	65	1		1					65	2	0.0000	1.0000	0.1505	16	0.0000	1.0000	0.5905
32	68				1	1	1	1	68	1	0.0000	1.0000	0.1505	16	0.0000	1.0000	0.5905
33	70				1	1	1	1	70	1	0.0000	1.0000	0.1505	15	0.0000	1.0000	0.5905
34	72				1	1	1	1	72	1	0.0000	1.0000	0.1505	14	0.0000	1.0000	0.5905
35	73				1	1	1	1	73	1	0.0000	1.0000	0.1505	13	0.0000	1.0000	0.5905
36	76				1	1	1	1	76	1	0.0000	1.0000	0.1505	12	0.0000	1.0000	0.5905
37	80				1	1	1	1	80	1	0.0000	1.0000	0.1505	11	0.0909	0.9091	0.5368
38	96				1	1	1	1	96	1	0.0000	1.0000	0.1505	10	0.0000	1.0000	0.5368
39	106				1	1	1	1	106	1	0.0000	1.0000	0.1505	9	0.1111	0.8889	0.4772
40	112				1	1	1	1	112	1	0.0000	1.0000	0.1505	8	0.1250	0.8750	0.4175
41	119				1	1	1	1	119	1	0.0000	1.0000	0.1505	7	0.1429	0.8571	0.3579
42	128				1	1	1	1	128	1	0.0000	1.0000	0.1505	6	0.1667	0.8333	0.2982
43	161				1	1	1	1	161	1	0.0000	1.0000	0.1505	5	0.0000	1.0000	0.2982
44	172	1		1					172	1	0.0000	1.0000	0.1505	4	0.0000	1.0000	0.2982
45	175				1	1	1	1	175	0				4	0.2500	0.7500	0.2237
46	180				3	3	3	3	180	0				3	0.0000	1.0000	0.2237
47	Grand Total	4	14	18	19	20	39	57									

TABLE A3.2. ADDITIONAL COLUMNS USED TO CALCULATE 95% CONFIDENCE INTERVALS USING GREENWOOD'S FORMULA.

Note: 95% confidence limit is the log-confidence interval (see Klein & Moeschberger 1997: 97).

I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	
<b>Group 1 (Non-treatment)</b>																			
4	Day	At risk	Empirical survival rate	Non-treatment	KM survival rate	Greenwood's formula			95% confidence limit			Empirical death rate	Empirical survival rate	KM survival rate	Greenwood's formula			95% confidence limit	
5	0			1.0000		1st step	2nd step	Standard error	Upper	Lower	At risk			1	1st step	2nd step	Standard error	Lower	Upper
6	3	18	0.9556	0.9444	0.9444	0.003268	0.003268	0.05399	0.66638	0.991983	39	0.0000	1.0000	1.0000	0	0	0	#DIV/0!	#DIV/0!
7	4	17	0.9588	0.9412	0.8889	0.003676	0.006944	0.074074	0.624167	0.970996	39	0.0256	0.9744	0.9744	0.000675	0.000675	0.02531	0.831588	0.996348
8	8	16	0.1250	0.8750	0.7778	0.008929	0.015873	0.097991	0.51102	0.910212	38	0.0000	1.0000	0.9744	0	0.000675	0.02531	0.831588	0.996348
9	10	14	0.0714	0.9286	0.7222	0.005495	0.021368	0.105572	0.456173	0.873782	38	0.0000	1.0000	0.9744	0	0.000675	0.02531	0.831588	0.996348
10	12	12	0.0000	1.0000	0.7222	0	0.021368	0.105572	0.456173	0.873782	38	0.0263	0.9737	0.9487	0.000711	0.001386	0.03652	0.810153	0.988923
11	14	12	0.0833	0.9167	0.6620	0.007576	0.028943	0.112631	0.396248	0.832143	37	0.0270	0.9730	0.9231	0.000751	0.002137	0.042669	0.780159	0.974523
12	15	11	0.0909	0.9091	0.6019	0.009091	0.038034	0.117375	0.340295	0.787287	36	0.0278	0.9722	0.8974	0.000794	0.00293	0.048581	0.749411	0.960219
13	16	10	0.1000	0.9000	0.5417	0.011111	0.049145	0.120081	0.287817	0.73947	35	0.0286	0.9714	0.8718	0.00084	0.003771	0.053654	0.719023	0.944531
14	17	9	0.0000	1.0000	0.5417	0	0.049145	0.120081	0.287817	0.73947	33	0.0303	0.9697	0.8454	0.000947	0.004718	0.058065	0.687718	0.927405
15	18	9	0.0000	1.0000	0.5417	0	0.049145	0.120081	0.287817	0.73947	31	0.0645	0.9355	0.7908	0.002225	0.006942	0.065893	0.624605	0.889568
16	21	9	0.1111	0.8889	0.4815	0.013889	0.063034	0.120884	0.238588	0.688818	29	0.0000	1.0000	0.7908	0	0.006942	0.065893	0.624605	0.889568
17	22	8	0.0000	1.0000	0.4815	0	0.063034	0.120884	0.238588	0.688818	27	0.0370	0.9630	0.7615	0.001425	0.008367	0.069659	0.590922	0.868443
18	23	8	0.0000	1.0000	0.4815	0	0.063034	0.120884	0.238588	0.688818	25	0.0400	0.9600	0.7311	0.001867	0.010034	0.073231	0.556418	0.845897
19	26	8	0.0000	1.0000	0.4815	0	0.063034	0.120884	0.238588	0.688818	24	0.0000	1.0000	0.7311	0	0.010034	0.073231	0.556418	0.845897
20	31	8	0.1250	0.8750	0.4213	0.017857	0.080891	0.119823	0.192553	0.63635	23	0.0435	0.9565	0.6993	0.001976	0.01201	0.076636	0.520963	0.821852
21	32	7	0.0000	1.0000	0.4213	0	0.080891	0.119823	0.192553	0.63635	22	0.0000	1.0000	0.6993	0	0.01201	0.076636	0.520963	0.821852
22	34	7	0.1429	0.8571	0.3611	0.02381	0.104701	0.116847	0.149799	0.57898	21	0.0000	1.0000	0.6993	0	0.01201	0.076636	0.520963	0.821852
23	35	6	0.0000	1.0000	0.3611	0	0.104701	0.116847	0.149799	0.57898	20	0.0500	0.9500	0.6643	0.002632	0.014641	0.080386	0.481732	0.795325
24	37	6	0.1667	0.8333	0.3009	0.033333	0.138034	0.111803	0.110563	0.519509	19	0.0000	1.0000	0.6643	0	0.014641	0.080386	0.481732	0.795325
25	38	5	0.0000	1.0000	0.3009	0	0.138034	0.111803	0.110563	0.519509	19	0.0000	1.0000	0.6643	0	0.014641	0.080386	0.481732	0.795325

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Table A3.2—continued

	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	
1																				
2	<b>Group 2 (Poison)</b>																			
3																				
4	<b>Day</b>	<b>At risk</b>	<b>Empirical death rate</b>	<b>Empirical survival rate</b>	<b>Non-treatment</b>	<b>KM survival rate</b>	Greenwood's formula			<b>95%confidence limit</b>			<b>Empirical death rate</b>	<b>Empirical survival rate</b>	<b>Poisson</b>	Greenwood's formula			<b>Lower</b>	<b>Upper</b>
							1st step	2nd step	Standard error	Lower	Upper	At risk				1st step	2nd step	Standard error	Lower	Upper
26	39	4	0.2500	0.7500	0.2257	0.063333	0.221368	0.106189	0.106189	0.062927	0.448804	19	0.0000	1.0000	0.6643	0	0.014641	0.080386	0.481732	0.795325
27	47	3	0.0000	1.0000	0.2257	0	0.221368	0.106189	0.106189	0.062927	0.448804	19	0.0000	1.0000	0.6643	0	0.014641	0.080386	0.481732	0.795325
28	51	3	0.0000	1.0000	0.2257	0	0.221368	0.106189	0.106189	0.062927	0.448804	18	0.0566	0.9434	0.6274	0.003268	0.017909	0.083966	0.441198	0.766795
29	52	3	0.3333	0.6667	0.1505	0.166667	0.368034	0.093727	0.093727	0.027089	0.370052	17	0.0000	1.0000	0.6274	0	0.017909	0.083966	0.441198	0.766795
30	53	2	0.0000	1.0000	0.1505	0	0.368034	0.093727	0.093727	0.027089	0.370052	17	0.0588	0.9412	0.5905	0.003676	0.021586	0.08676	0.402535	0.737181
31	65	2	0.0000	1.0000	0.1505	0	0.368034	0.093727	0.093727	0.027089	0.370052	16	0.0000	1.0000	0.5905	0	0.021586	0.08676	0.402535	0.737181
32	68	1	0.0000	1.0000	0.1505	0	0.368034	0.093727	0.093727	0.027089	0.370052	16	0.0000	1.0000	0.5905	0	0.021586	0.08676	0.402535	0.737181
33	70	1	0.0000	1.0000	0.1505	0	0.368034	0.093727	0.093727	0.027089	0.370052	15	0.0000	1.0000	0.5905	0	0.021586	0.08676	0.402535	0.737181
34	72	1	0.0000	1.0000	0.1505	0	0.368034	0.093727	0.093727	0.027089	0.370052	14	0.0000	1.0000	0.5905	0	0.021586	0.08676	0.402535	0.737181
35	73	1	0.0000	1.0000	0.1505	0	0.368034	0.093727	0.093727	0.027089	0.370052	13	0.0000	1.0000	0.5905	0	0.021586	0.08676	0.402535	0.737181
36	76	1	0.0000	1.0000	0.1505	0	0.368034	0.093727	0.093727	0.027089	0.370052	12	0.0000	1.0000	0.5905	0	0.021586	0.08676	0.402535	0.737181
37	80	1	0.0000	1.0000	0.1505	0	0.368034	0.093727	0.093727	0.027089	0.370052	11	0.0909	0.9091	0.5368	0.009091	0.030677	0.094026	0.339528	0.698909
38	96	1	0.0000	1.0000	0.1505	0	0.368034	0.093727	0.093727	0.027089	0.370052	10	0.0000	1.0000	0.5368	0	0.030677	0.094026	0.339528	0.698909
39	106	1	0.0000	1.0000	0.1505	0	0.368034	0.093727	0.093727	0.027089	0.370052	9	0.1111	0.8889	0.4772	0.013689	0.044566	0.100737	0.274097	0.655131
40	112	1	0.0000	1.0000	0.1505	0	0.368034	0.093727	0.093727	0.027089	0.370052	8	0.1250	0.8750	0.4175	0.017957	0.062423	0.10432	0.216523	0.607419
41	119	1	0.0000	1.0000	0.1505	0	0.368034	0.093727	0.093727	0.027089	0.370052	7	0.1429	0.8571	0.3579	0.02381	0.086232	0.105096	0.165444	0.566075
42	128	1	0.0000	1.0000	0.1505	0	0.368034	0.093727	0.093727	0.027089	0.370052	6	0.1667	0.8333	0.2982	0.033333	0.119566	0.103127	0.12022	0.501098
43	161	1	0.0000	1.0000	0.1505	0	0.368034	0.093727	0.093727	0.027089	0.370052	5	0.0000	1.0000	0.2982	0	0.119566	0.103127	0.12022	0.501098
44	172	1	0.0000	1.0000	0.1505	0	0.368034	0.093727	0.093727	0.027089	0.370052	4	0.0000	1.0000	0.2982	0	0.119566	0.103127	0.12022	0.501098
45	175	0										4	0.2500	0.7500	0.2237	0.083333	0.202899	0.100756	0.067184	0.436832
46	180	0										3	0.0000	1.0000	0.2237	0	0.202899	0.100756	0.067184	0.436832

# Appendix 4

## CALCULATION OF SURVIVAL TO A GIVEN NUMBER OF DAYS

Excel spreadsheet for the calculation of survival of brown kiwi to a given number of days based on the assumption of constant survival rate, using data from Appendix 2. Calculations are outlined in section 5.5.

	A	B	C	D	E	F
1				Treatment		
2			Data	Non-treatment	Poison	Grand Total
3			Sum of Cdays	577	2441	3018
4			Sum of Death?	14	20	34
5						
6						
7	Calculating confidence interval for survival in constant survival (exponential) model					
8						
9				Non-treatment	Poison	
10	Total time exposed		$T$	577	2441	
11	Number of deaths		$d$	14	20	
12						
13	Mayfield estimator of survival			41.2	122.1	
14						
15	Survival probability to	180 days				
16	Point estimate			0.013	0.229	
17	Lower 95% Confidence Interval			0.001	0.112	
18	Upper 95% Confidence Interval			0.092	0.406	

# Appendix 5

## CALCULATION OF THE MANTEL-HAENSZEL STATISTIC

Excel spreadsheet used to calculate the Mantel-Haenszel statistic comparing the survival rate in two populations of brown kiwi chicks, one in an area where possums (and probably other predators) were being poisoned, and a second in a nearby non-treatment area. The raw data are given in Appendix 2. Calculations are outlined in section 6.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1																	
2																	
3	Count of Band	Treatment	Death?														
4		Non-treatment		Non-treatment Total	Poison	Poison Total	Poison Total	Grand Total	Number at risk in group 1	Number at risk in group 2	Total number at risk	Total deaths	Expected deaths in group 1	Expected deaths in group 2	Difference of Actual and expected group 1	Difference of Actual and expected group 2	Estimated variance
5	Cdays	0	1		0	1			n <sub>1j</sub>	n <sub>2j</sub>	n <sub>j</sub>	d <sub>j</sub>	e <sub>1j</sub>	e <sub>2j</sub>	d <sub>1j</sub> -e <sub>1j</sub>	d <sub>2j</sub> -e <sub>2j</sub>	
6	3		1	1				1	18	39	57	1	0.3158	0.6842	0.6842	-0.6842	0.216
7	4		1	1		1	1	2	17	39	56	2	0.6071	1.3929	0.3929	-0.3929	0.415
8	8		2	2				2	16	38	54	2	0.5926	1.4074	1.4074	-1.4074	0.409
9	10		1	2				2	14	38	52	1	0.2692	0.7308	0.7308	-0.7308	0.197
10	12						1	1	12	38	50	1	0.2400	0.7600	-0.2400	0.2400	0.182
11	14		1	1			1	2	12	37	49	2	0.4898	1.5102	0.5102	-0.5102	0.362
12	15		1	1			1	2	11	36	47	2	0.4681	1.5319	0.5319	-0.5319	0.351
13	16		1	1			2	3	10	35	45	2	0.4444	1.5556	0.5556	-0.5556	0.338
14	17						2	2	9	33	42	1	0.2143	0.7857	-0.2143	0.2143	0.168
15	18					2	2	2	9	31	40	2	0.4500	1.5500	-0.4500	0.4500	0.340
16	21		1	1		2	2	2	9	29	38	1	0.2368	0.7632	0.7632	-0.7632	0.181
17	22					1	1	2	8	27	35	1	0.2286	0.7714	-0.2286	0.2286	0.176
18	23					1	1	1	8	26	33	1	0.2424	0.7576	-0.2424	0.2424	0.184
19	26					1	1	1	8	24	32	0	0.0000	0.0000	0.0000	0.0000	0.000
20	31		1	1		1	1	2	8	23	31	2	0.5161	1.4839	0.4839	-0.4839	0.370
21	32					1	1	1	7	22	29	0	0.0000	0.0000	0.0000	0.0000	0.000
22	34		1	1		1	1	2	7	21	28	0	0.0000	0.0000	0.0000	0.0000	0.000
23	35					1	1	1	6	20	26	1	0.2500	0.7500	0.7500	-0.7500	0.188
24	37		1	1				1	6	19	25	1	0.2400	0.7600	-0.2308	0.2308	0.178
25	38		1	1				1	5	19	24	0	0.0000	0.0000	0.0000	0.0000	0.000
26	39		1	1				1	4	19	23	1	0.1739	0.8261	0.8261	-0.8261	0.144
27	47					1	1	1	3	19	22	0	0.0000	0.0000	0.0000	0.0000	0.000
28	51					1	1	1	3	18	21	1	0.1429	0.8571	-0.1429	0.1429	0.122

Continued on next page

Appendix 5—continued

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	Count of Band	Treatment	Death?														
2																	
3																	
4	Cdays	Non-treatment	Poison	Non-treatment Total	Poison	Poison Total	Grand Total	Number at risk in group 1	Number at risk in group 2	Total number at risk	Total deaths	Expected deaths in group 1	Expected deaths in group 2	Difference of Actual and expected group 1	Difference of Actual and expected group 2	Estimated variance	
5		0	1		0	1		n <sub>1j</sub>	n <sub>2j</sub>	n <sub>j</sub>	d <sub>j</sub>	e <sub>1j</sub>	e <sub>2j</sub>	d <sub>1j</sub> -e <sub>1j</sub>	d <sub>2j</sub> -e <sub>2j</sub>		
29	52	1		1			1	3	17	20	1	0.1500	0.8500	0.8500	-0.8500	0.128	
30	53		1		1		1	2	17	19	1	0.1053	0.8947	-0.1053	0.1053	0.094	
31	65	1		1			1	2	16	18	0	0.0000	0.0000	0.0000	0.0000	0.000	
32	68		1		1		1	1	16	17	0	0.0000	0.0000	0.0000	0.0000	0.000	
33	70		1		1		1	1	15	16	0	0.0000	0.0000	0.0000	0.0000	0.000	
34	72		1		1		1	1	14	15	0	0.0000	0.0000	0.0000	0.0000	0.000	
35	73		1		1		1	1	13	14	0	0.0000	0.0000	0.0000	0.0000	0.000	
36	76		1		1		1	1	12	13	0	0.0000	0.0000	0.0000	0.0000	0.000	
37	80		1		1		1	1	11	12	1	0.0833	0.9167	-0.0833	0.0833	0.076	
38	96		1		1		1	1	10	11	0	0.0000	0.0000	0.0000	0.0000	0.000	
39	106		1		1		1	1	9	10	1	0.1000	0.9000	-0.1000	0.1000	0.090	
40	112					1	1	1	8	9	1	0.1111	0.8889	-0.1111	0.1111	0.099	
41	119				1		1	1	7	8	1	0.1250	0.8750	-0.1250	0.1250	0.109	
42	128				1		1	1	6	7	1	0.1429	0.8571	-0.1429	0.1429	0.122	
43	161		1		1		1	1	5	6	0	0.0000	0.0000	0.0000	0.0000	0.000	
44	172	1		1			1	1	4	5	0	0.0000	0.0000	0.0000	0.0000	0.000	
45	175				1		1	1	4	4	1	0.0000	1.0000	0.0000	0.0000	0.000	
46	180		3		3		3	0	3	3	0	0.0000	0.0000	0.0000	0.0000	0.000	
47	Grand Total	4	14	18	19	20	39							Sum	6.830	-6.830	5.421
48														Squared sum	46.6429		
49														Log rank statistic	8.6034	P value	0.0034
50																	