Paradise Shelduck Moult Survey

January/February 2024

Results of annual counts at West Coast moult sites.

Baylee Kersten, Fish & Game Officer, March 2024

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Summary

The endemic Paradise Shelduck (Tadorna variegata) is the West Coast Regions most intensely managed game bird. Large concentrations of birds can cause conflict with landowners resulting in opportunities for hunters to harvest surplus birds. Each year repeat counts are made of known moult sites to gain an index of relative abundance. This year 24,285 birds were observed in total, this is a 7% increase from the previous year and is 4,827 birds above the 25-year average. Long-term monitoring (over 25years) indicates that the northern moult sites have slowly increased by 5% but in the short term (5years) has decreased by 8%. Long term monitoring (over 25years) indicates that the southern moult sites have increased by 17% on average and in the short term (5years) have increased by 4%. Staff recommendations are: Retain current bag limits and season durations. Allocate money in the annual budget for plane surveys intermittently. Continue to promote the West Coast shelduck population as an underutilised resource and rewarding hunting opportunity. Undertake organised hunts in areas with high shelduck populations and properties where significant crop predation occurs.

Introduction

Paradise Shelduck (*Tadorna variegata*) ('shelduck') are an endemic New Zealand species and well distributed throughout much of the country. The highest concentrations of shelduck are typically found adjacent to areas of developed farmland. On the West Coast large concentrations of shelduck can be found in the Grey Valley and its catchments, the Buller, Karamea and South Westland.

Since monitoring began in the 1990s populations of shelduck on the West Coast have overall increased but the population has fluctuated during the monitoring period. This population increase is a response to improvement and expansion of their desired habitat – productive farmland (Kelly, 2010). Monitoring has now become critical, both in appeasing landowner concerns that the population is not escalating unchecked, and to allow and to promote opportunities for hunters to harvest surplus birds. This survey supplies the baseline information to inform regulation setting, including season length, bag limits and special seasons.

Shelduck congregate during January to March at specific sites to moult. These areas are typically a small to medium sized water body with a nearby food supply. By identifying the location of these moult sites, shelduck populations can be monitored from year to year by counting birds present at each site.

The aim of the current survey was to:

1) Repeat the annual counts of known shelduck moult sites to gain an index of relative abundance of shelduck on the West Coast.
2) Identify any new sites holding shelduck for repeat counting in 2025.

3) Use route regression analysis to assess population trends in the northern and southern management units.
4) Provide recommendations for management of the shelduck population in context of the goals and objectives of the West Coast Region 'Sports Fish & Game Bird Management Plan'.

Method

The 2024 moult site counts were undertaken in late January and early February using a DJI Mavic Pro or a DJI Mavic Air 2 drone. Sites were flown around first to identify what birds were present. Moulting shelduck tend to swim out onto open water when they hear the drone. Video and/or photos were then taken, and the footage reviewed in the office. The remaining sites were counted aerially, using a Piper Super Cub aircraft operated by Knights Point Air from Haast Airstrip on January 25th, or from the ground/boat using binoculars.

The number of birds and the percentage change from the previous year was calculated for all sites and then for the northern and southern management units. Fish & Game best practice 'route regression analysis' was then used to analyse the count data. The annual change in counts at individual sites was calculated and summarised into the northern and southern management units. Finally, the data within the northern and southern management units was summarised for population change over time.

Results

Overall numbers

A total of 24,285 shelduck were observed moulting across all sites in 2024. This value was up 1,483 shelduck from the 2023 count of 22,802 this equates to an approximate 7% increase in overall numbers counted from the previous year.

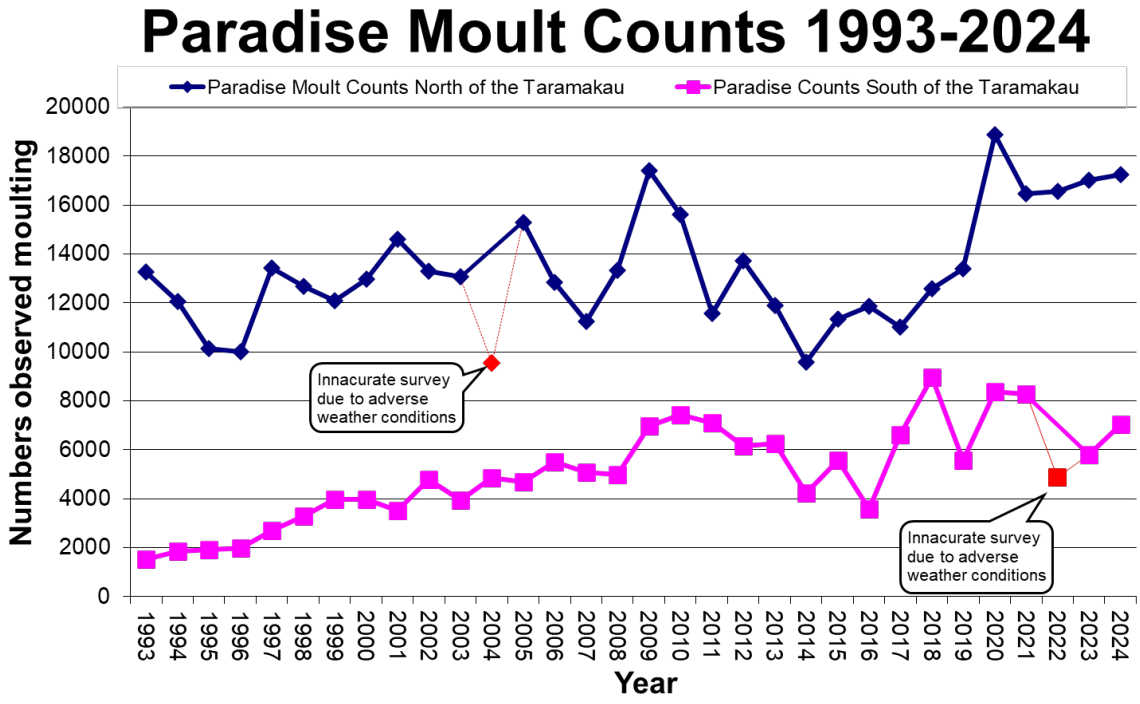

Figure 1: Number of Paradise Shelduck observed moulting in each of the separate management areas since 1993.

Northern Management Unit (north of Taramakau River).

A total of 17,245 shelduck were observed moulting at sites north of the Taramakau River in 2024. This value was up 158 birds from the 2023 count of 17,087, this equates to an approximate 1% increase in overall numbers counted from the previous year (see Figure 1). Over the past 32 years (1993-2024) shelduck across all monitored sites north of the Taramakau have increased by 5% on average. However, over the past five years (2020-2024) numbers of shelduck across all sites north of the Taramakau have decreased by 8% on average (Figure 2).

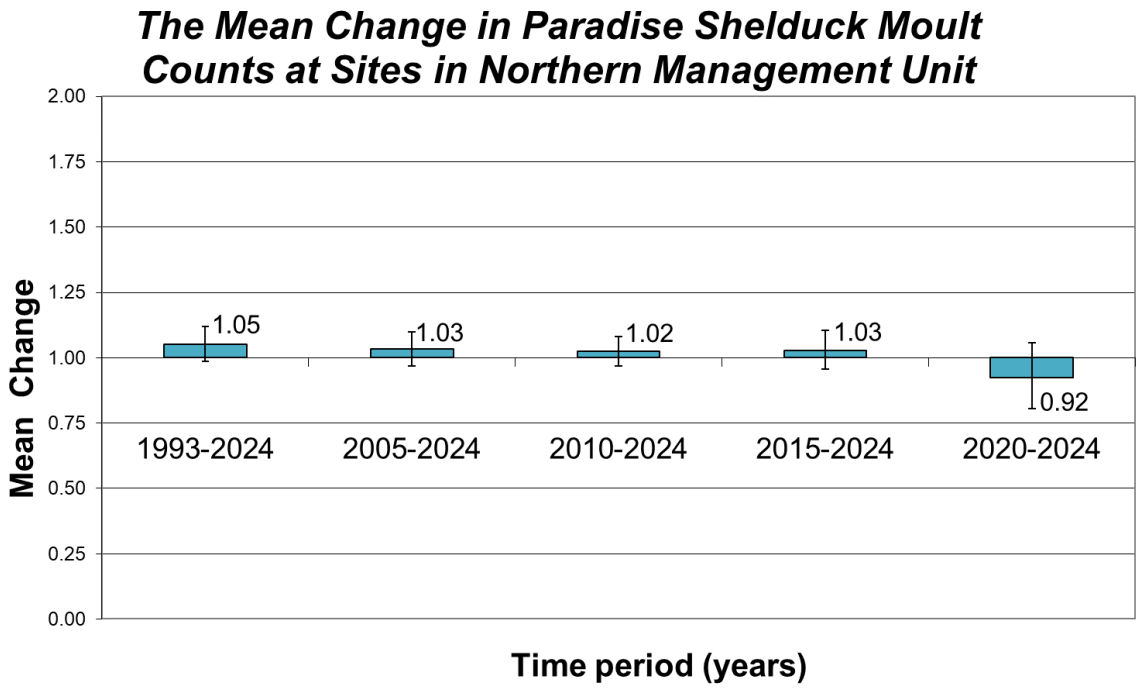

Figure 2: The mean change (±standard error) in Paradise Shelduck moult counts at sites north of the Taramakau River over specified time periods. Values above or below 1.0 represent an increase or decrease in population over that period.

Southern Management Unit (south of the Taramakau River)

A total of 7,040 birds were observed moulting south of the Taramakau River in 2024. This value is an increase of 1,245 birds from the 2023 count of 5,795 and equates to a 21% increase in overall numbers from the previous year (see Figure 1). Over the past 32 years (1993-2024) shelduck across all monitored sites south of the Taramakau have increased by 17%. However, over the past five years (2020-2024) distribution and numbers of shelduck across sites south of the Taramakau have increased 4% on average (Figure 3).

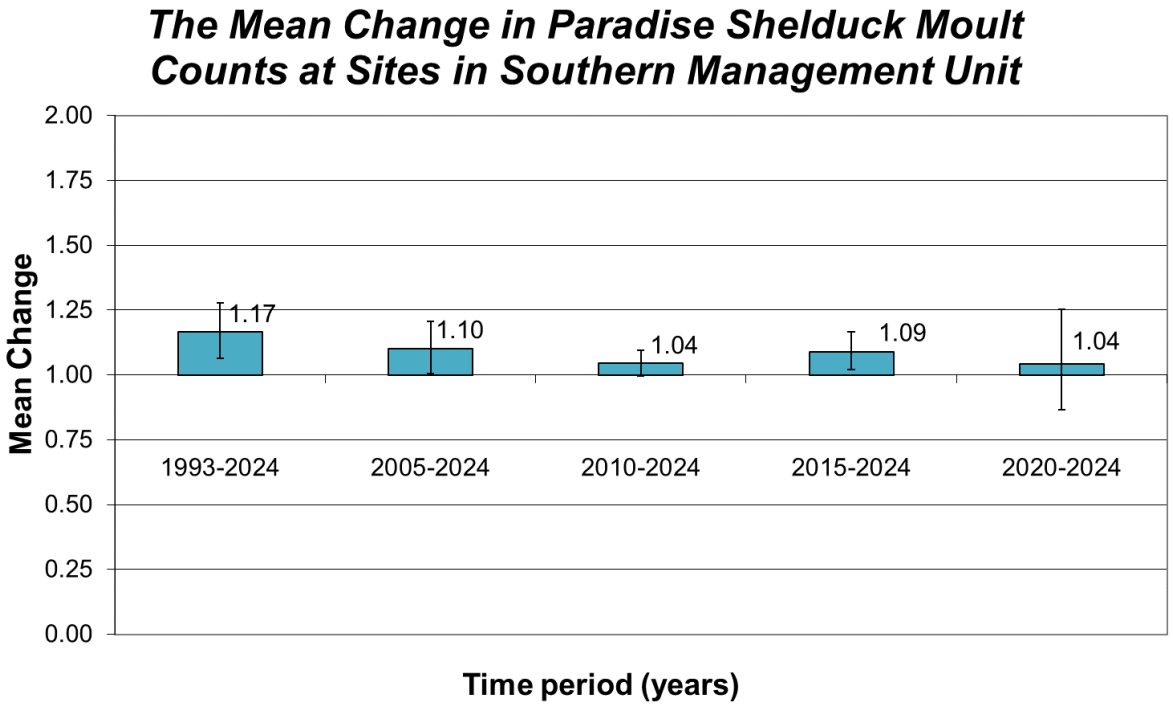

Figure 3: The mean change (±standard error) in Paradise Shelduck moult counts at sites south of the Taramakau River over specified time periods. Values above or below 1.0 represent an increase or decrease in population over that period.

Discussion

This year's count has again come in well above average due to another year of the northern management area having a high count and the southern management area trending upwards. The southern management area count this year was up 1,200 birds on last year's count and 2,200 birds on 2022's low confidence count. Plane counting was completed in South Westland and the additional sites counted contributed an additional 650 birds, accounting for half the increase in the southern management area count. Three hundred of which were counted at the Waitaha lagoon, which staff will now attempt to ground count in future between years that flights are completed.

The Grey River moulting birds continue to be mobile with the Moonlight site reducing to 1,118 birds as the birds move back to the Ngahere with the site accounting for just over 3,000 moulting birds this year. The relocating of sites like this highlights the importance of conducting plane surveys intermittently, especially in remote areas like South Westland where staff are unlikely to be notified by landowners or outdoor recreationalists of an abundance of paradise shelduck.

When the results from both the annual moult counts, and the game harvest survey are combined, management tools can be put in place to maintain a sustainable shelduck population while maximising hunting opportunities. In the regular 2023 season, an estimated total of 5,350 shelduck were harvested by West Coast and out of region licence holders. West Coast licence holders harvested on average nine shelducks for the regular 2023 season. With the population and harvest both increasing, it would appear their currently good paradise shelduck hunting on offer.

Bringing back the summer paradise shelduck season appears to have been well received although underutilised by many hunters. The small percentage of hunter that utilise the season experience great hunting and aid in reducing landowner conflict by dispersing large post moult paradise shelduck mobs. The summer season should remain in place to mitigate landowner complaints,

provide additional opportunities to licence holders, and promoted as an opportunity to introduce new hunters to the sport.

Staff Recommendations

- Retain current bag limits and season durations.
- Allocate money in the annual budget for plane surveys intermittently.
- Continue to promote the West Coast shelduck population as an underutilised resource and rewarding hunting opportunity.
- Undertake organised hunts in areas with high shelduck populations and properties where significant crop predation occurs.

References

Fish & Game West Coast Region (2011). *Sports Fish and Game Management Plan for the West Coast Fish & Game Region*. Fish & Game West Coast, internal report.

Kelly, D (2010). *Paradise Shelduck Moult Survey 2010*. Fish & Game West Coast internal report.

Appendices

Appendix A: Aerial and ground counts of moult sites from 1993 to 2024.

Northern Management Unit

	Count																																
Area	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
L. Haupiri	702	794	762	540	660	660	490	420	450	450	300	200	350	180	80	320	200	20	20	100	230	230	150	330	430	250	1491	1842	1286	1041	1477	1113
L. Poerua	190	216	298	480	210	300	160	320	150	600	300	450	300	160	70	110	450	50	300	30	120	108	232	596	790	400	592	460	735	701	711	400
Lake Brunner	2722	1400	1440	1200	2200	1950	2100	2550	2050	400	1680	750	1000	800	1000	1350	1400	300	500	900	500	700	1655	2100	1020	1500	1548	2809	1724	2217	2381	1842
Arnold River																											66	68	370	545	362	205
Ikamatua	1522	1500	2062	2500	3400	2750	2200	2400	3500	2600	1413	600	3500	2950	1900	3000	2750	3000	1420	1300	620	1050	903	420	830	355	420	909	886	712	691	955
Barrytown Lagoon	156	219	164	204	266	230	215	165	270	300	210	150	300	450	450	320	400	370	400	290	230	290	330	170	192	333	450	628	367	380	403	448
Fergusons pond	300	2900	1600	0	175	350	550	12	450	0	5	0	0	150	200	150	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0
Karamea	226	383	354	580	740	450	780	850	1450	1400	1120	1300	570	660	1000	1000	1100	2000	200	1200	1450	950	1450	1100	950	1050	967	1530	1199	1216	880	1270
Glasseye Lake																												223	275	559	364	656
Virgin Flat																			700	650	600	450	580	700	124	218	195	53	136	53	0	204
Collins and Gillows	340	437	426	542	873	890	705	990	1186	1330	1060	1100	1050	1600	1085	700	950	1850	1200	1000	288	450	580	350	380	520	962	1453	1312	1080	1645	1482
Kokiri pond	2400	2200	2400	2280	3200	3000	2100	3500	3350	4000	3200	1800	2600	2500	1500	2500	3000	3500	3300	2000	1800	1900	1500	1100	426	560	937	733	438	470	484	380
Ahaura River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	50	35	50	95	120	115	56	114	110	113	400	305	190	0	300	350	300
Grey River	3902	400	74	182	10	80	200	160	0	0	230	230	165	150	570	410	1960	200	280	320	747	191	910	1261	2579	2700	2571	3030	2434	2584	2549	1713
Grey River Ngahere					450	510	530	580	750	1150	2500	1260	3000	560	350	900	500	1000	280	1950	2500	500	400	1150	309	2500	345	530	163	882	1239	3009
Runanga Oxidation Ponds															0	0	250	400	400	300	80	300	200	400	350	350	429	987	561	461	518	564
Inangahua/Buller	166	77	78	148	150	160	160	220	180	160	85	100	100	90	60	100	80	80	200	150	150	290	280	170	130	118	259	487	748	202	270	460
Bell Hill Airstrip			440	850	400	10	1400	310	4	100	550	1250	2200	1800	2200	1600	3000	1600	1400	900	950	450	276	250	120	68	166	215	149	20	59	17
Bell Hill house															0	0	450	500	400	190	1	300	290	17	8	0	178	730	1229	1291	942	496
Bell Hill New Pond																												159	12	0	0	0
Waipuna Farm Pond				163	0	220	150	1	0	0	2	50	50	50	30	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Waipuna Farm				340	0	0	0	120	0	0	0	95	0	0	30	100	0	160	150	205	195	139	225	34	90	300	43	237	96	111	105	80
Lake Kangaroo	0	0	0	0	0	0	0	0	0	0	0	0	0	130	0	150	180	160	0	8	20	30	6	27	10	30	20	0	95	0	0	0
Lady Lake					700	1110	270	360	800	820	410	200	110	350	80	310	200	250	80	250	120	60	145	25	40	0	64	89	20	40	282	169
Lake Swan	0	0	0	0	0	0	0	0	0	0	0	0	0	200	600	200	150	0	150	100	125	220	180	97	170	100	151	250	212	50	121	210
Mawheraiti							65	10	0	0	0	0	0	0	0	0	0	100	0	40	0	37	104	93	321	0	0	100	40	50	10	30
Greenstone Pond	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	350	20	100	110	40	55	50	0	85	70	87	60	130	100	80	60
Reefton Oxi ponds																					300	70	319	450	380	550	581	573	711	737	643	272
Camerons (new River pond)																							50	100	50	0	115	120	170	236	253	250
Reddale Pond																				1600	700	750	400	800	1100	200	360	398	968	529	268	660
Total	13267	12051	10140	10011	13434	12670	12075	12968	14590	13310	13065	9535	15295	12780	11255	13340	17405	15610	11575	13713	11181	9576	10879	10950	9867	12372	13385	18863	16466	16567	17087	17245
Change		-1216	-1911	-129	3423	-764	-595	893	1622	-1280	-245	-3530	5760	-2515	-1525	2085	4065	-1795	-4035	2138	-2532	-1605	1303	71	-1083	2505	1013	5478	-2397	101	520	158
% Change		-9	-16	-1	34	-6	-5	7	13	-9	-2	-27	60	-16	-12	19	30	-10	-26	18	-18	-14	14	1	-10	25	8	41	-13	1	3	1

Southern Management Unit

	Count																															
Area	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
L. Arthur	100	68	150	239	200	120	170	135	50	60	58	20	30	20	0	0	20	4	40	50	86	135	175	80	190	50	92	80	240	200	125	300
L. Rotokino	1196	840	1430	1307	1960	1992	2470	2825	2350	3120	3050	2300	2000	2000	1500	1900	2800	1000	700	1490	2070	430	1530	570	1210	4000	1440	2350	1800	750	1200	1500
Lake Wahapo	0	0	0		0	0	0	0	0	0	0	0	0	200	20	0	0	25	70	30	40	98	0	60	150	100	150	30	220	150	100	250
Saltwater Lagoon	0	940	0	0	0	0	250	50	0	0	0	0	30	0	50	0	10	0	60	100	90	61	45	50	31	50	90	0	0	30		50
Five Mile Lagoon	0	0		0	0	0	0	0	0	0	0	0	0	280	260	80	70	50	130	100	103	104	110	160	94	70	34	0	30	35		150
Totara Lagoon	239	0	320	420	210	370	165	170	160	165	80	0	100	100	70	135	0	120	140	170	295	81	38	235	295	20	225	122	300	257	350	250
Lake Pratt	0	0	0	0	0	0	0	0	0	0	0	0	0	200	350	200	400	250	150	160	200	280	120	200	250	200	140	450	280	300	250	150
Cook Lagoon	0	0	0	0	0	0	0	0	0	0	0	0	0	300	350	300	300	350	1200	300	300	0	120	50	150	50	72	0	150	80		100
Cook River																					130	59	284	70	296	0	140	400	280	190	500	750
Waitaha Lagoon	0	0	0	0	0	0	0	0	0	0	0	170	350	400	350	370	250	360	240	140	300	230	150	5	30	10	4	165	54	32		300
Arahura	0	0	0	0	0	0	0	200	390	780	88	230	280	940	500	900	1500	600	1200	920	500	665	450	184	422	450	384	710	800	600	900	800
Kapitea Reservoir	0	0	0	0	320	810	610	450	510	650	520	136	390	100	30	110	120	20	5	65	5	29	54	20	2	20	40	30	45	30	50	20
Grove Swamp	0	0	0	0	0	0	300	140	40	0	150	2000	1500	700	550	700	1500	4000	2000	1100	1650	1300	1550	380	745	2000	1400	1250	1850	850	1300	1000
Hokitika River	0	0	0	0	0	0	0	0	0	0	0	0	0	300	500	180	0	100	50	240	64	56	53	208	205	50	137	170	160	0	200	500
Whataroa River																			50	0	110	0	66	170	0	10	14	0	60	160	100	50
Lake Ianthe																			180	300	50	200	160	200	338	200	330	400	444	20	200	100
Okarito Lagoon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500	0	0	550	900	780	70	484	530	565	1854	1600	600	2150	1300	1020	520	700
Wanganui Lagoon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	110	0	0	0	0	0	0	0	5	0	10	3	2	0	0		50
Poerua River pond																				70	18	0	65	60	140	0	70	30	75	45		0
Hari Hari farms																				150	20	6	0	185	68	0	55	4	15	45		
Lake Kaniere																					150	17	70	0	147	70	140	44	129	30	0	20
Waiho River																								120	0	0	0	0	0	55		0
Taramakau																											100	40	50			
Total	**1535**	**1848**	**1900**	**1966**	**2690**	**3292**	**3965**	**3970**	**3500**	**4775**	**3946**	**4856**	**4680**	**5540**	**5090**	**4985**	**6970**	**7429**	**7115**	**6165**	**6251**	**4235**	**5570**	**3577**	**6617**	**8960**	**5560**	**8427**	**8282**	**4879**	**5795**	**7040**
Change		**313**	**52**	**66**	**724**	**602**	**673**	**5**	**-470**	**1275**	**-829**	**910**	**-176**	**860**	**-450**	**-105**	**1985**	**459**	**-314**	**-950**	**86**	**-2016**	**1335**	**-1993**	**3040**	**2343**	**-3400**	**2867**	**-145**	**-3403**	**916**	**1245**
% Change		**20**	**3**	**3**	**37**	**22**	**20**	**0**	**-12**	**36**	**-17**	**23**	**-4**	**18**	**-8**	**-2**	**40**	**7**	**-4**	**-13**	**1**	**-32**	**32**	**-36**	**85**	**35**	**-38**	**52**	**-2**	**-41**	**19**	**21**

Appendix B: West Coast Region Paradise Shelduck moult count sites.

Moult Area	NZTM Map grid reference			
	Northing	Easting	Northing	Easting
L. Haupiri	5286391.6	1492479.8		
L. Poerua	5270574.8	1476089		
Lake Brunner	5283205.2	1475503.2		
Arnold River	5288591	1470167		
Ikamatua	5320364.6	1491629.2		
Ikamatua	5321226.3	1491977.2		
Barrytown Lagoon	5327157.7	1460956.3		
Karamea	5434333.2	1524774.8		
Glasseye Lake	5414683	1522000		
Virgin flat	5366728.3	1476234.5		
Collins and Gillows	5374297.5	1480421.9		
Kokiri pond	5295944.1	1466377.7		
Ahaura River	5290399.1	1501656	5299918.4	1496530
Grey River	5317371.8	1490202	5305236.3	1469544.9
Grey River Ngahere	5303381	1468471.8		
Runanga Oxidation Ponds	5305572.1	1456214.1		
Inangahua/Buller	5363806.6	1510086.6		
Bell Hill Airstrip	5288284.4	1479090.3		
Bell Hill House	5286461.7	1485843.4		
Waipuna Farm pond	5219923.9	1496637.4		
Waipuna Farm	5309914.6	1496662.7		
Kangaroo Lake	5280914.9	1480401.7		
Lady Lake	5282324.1	1483041.4		
Lake Swan	5276598	1479592.2		
Mawheraiti	5335951.8	1497432.6		
Greenstone Pond	5277640	1454678.5		
Reddale Pond	5339256.4	1508720.5		
Reefton Ponds	5337230	1504823.3		
Camerons pond	5287587.5	1447367.5		
L. Arthur	5248056	1444683		
L. Rotokino	5218444.3	1391019.8		
L. Wahapo	5207542.5	1378773.9		
Saltwater Lagoon	5218445.1	1384909.2		
Five Mile Lagoon	5205162.7	1364472		
Totara Lagoon	5255928.5	1425496.2		
Lake Pratt	5196286.2	1370685.3		
Cook Lagoon	5184874.4	1339758.6		
Cook River (Oxy ponds)	5182977	1356601		
Waitaha Lagoon	5239832.6	1407604		
Arahura	5270233.6	1442185.1		
Kapitea Reservoir	5272033.4	1452226.9		
Grove Swamp	5255748.5	1430778.7		
Hokitika River	5265407.4	1436224		
Whataroa River	5217600.8	1386907.3	5254807.1	1433662.3
Lake Ianthe	5230228.7	1406335.3		
Okarito Lagoon	5213936.1	1373735		
Wanganui Lagoon	5231805.4	1390435.9		
Poerua River pond	5222394.3	1393511.6		
Lake Kaniere	5252602.6	1449532.2		