Paradise Shelduck Moult Survey

January/February 2022

Results of annual counts at West Coast moult sites.



Baylee Kersten, Fish & Game Officer, March 2022



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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 21,446 birds were observed in total, this is a 13% decrease from the previous year and about 3,000 birds above the 25-year average. Long-term monitoring (over 25years) indicates that the northern moult sites have slowly increased by 3% but in the short term (5years) has increased by 12%. Long term monitoring (over 25years) indicates that the southern moult sites have increased by 18% on average but the rate of increase has slowed in the short term (5years) to 11%. Staff recommendations are retain current bag limits and season duration. 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. 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 provides 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 2023.
- 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

Most of the 2022 moult site counts were undertaken in late January and early to mid-February using a DJI Mavic Pro or 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 February 21st, or from the ground/boat using binoculars. During the aerial flight the location any new or changed sites were identified and counts undertaken (Appendix 1).

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 21,446 shelduck were observed moulting across all sites in 2022. This value was down 3,302 shelduck from the 2021 count of 24,748 this equates to an approximate 13% decrease in overall numbers counted from the previous year.

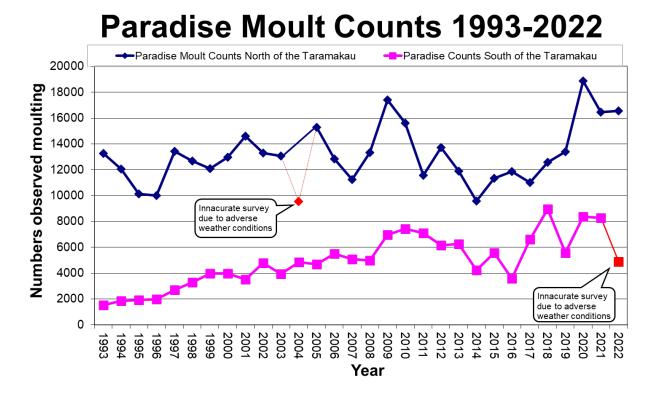


Figure 1: Number of Paradise Shelduck observed moulting in each of the separate management areas since 1993.

Northern Management Unit (north of Taramakau River).

A total of 16,567 shelduck were observed moulting at sites north of the Taramakau River in 2022. This value was up 101 birds from the 2021 count of 16,466, this equates to an approximate 0.6% increase in overall numbers counted from the previous year (see Figure 1). Over the past 30 years (1993-2022) shelduck across all monitored sites north of the Taramakau have increased by 3% on average. However, over the past five years (2018-2022) numbers of shelduck across all sites north of the Taramakau have increased by 12% on average (Figure 2).

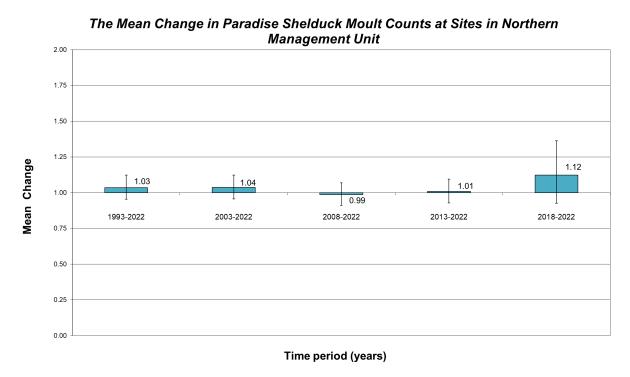
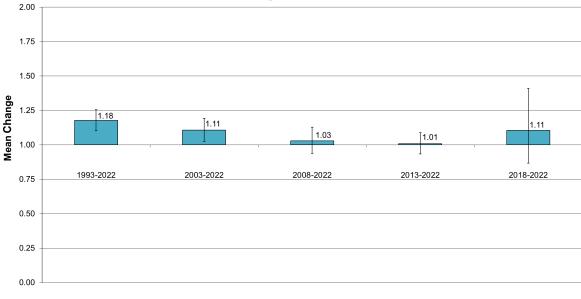


Figure 2: The mean change (±standard error) in Paradise Shelduck moult counts at sites north of the Taramakau River over specified time periods. Values above or below 1.0 represent an increase or decrease in population over that period.

Southern Management Unit (south of the Taramakau River)

A total of 4,879 birds were observed moulting south of the Taramakau River in 2021. This value is a decrease of 3,403 birds from the 2021 count of 8,282 and equates to a 41% decrease in overall numbers from the previous year (see Figure 1). Over the past 30 years (1993-2022) shelduck across all monitored sites south of the Taramakau have increased by 18%. However, over the past five years (2018-2022) distribution and numbers of shelduck across many sites south of the Taramakau have increased 11% on average (Figure 3).

The Mean Change in Paradise Shelduck Moult Counts at Sites in Southern Management Unit



Time period (years)

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

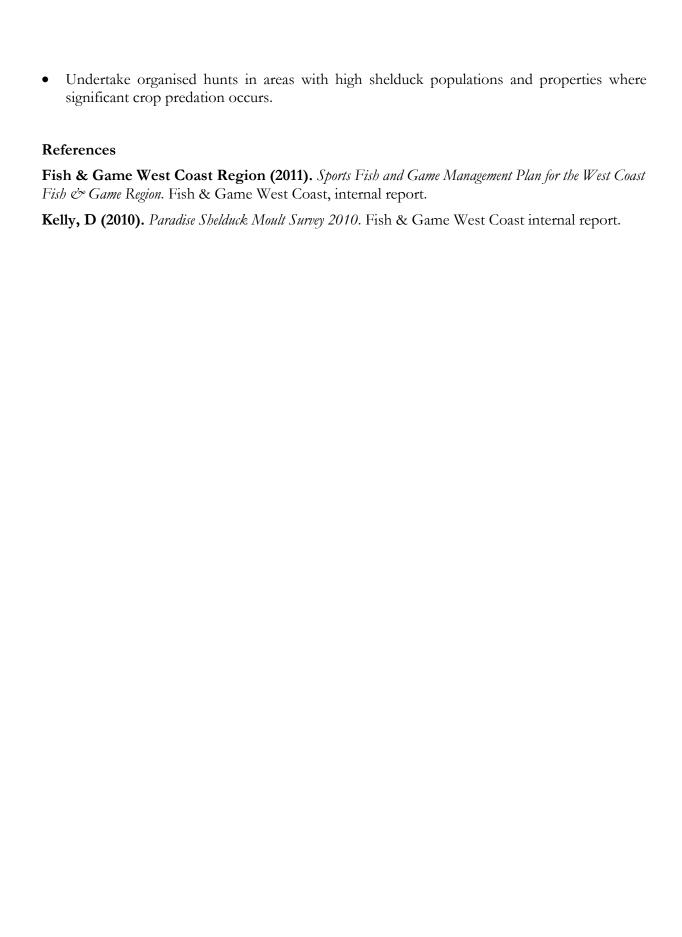
Despite the southern management area's count coming in significantly lower than last year, the overall count for the region is still approximately 3,000 birds above than the long-term average. This is due to another year of the northern management area having a high count. The southern management area count this year is believed to be a poor representation of the current shelduck population trend. Due to significant flooding in early February counts were delayed beyond the peak count period. In addition to a delayed count, the flooding greatly disturbed moult sites such as Lake Rotokino and Groves Swamp. This disturbance likely caused early dispersal, further reducing the shelducks present during counts. Lastly, a dry hot January likely encouraged early moulting, which was likely further detrimental to delayed southern counts.

Northern counts were completed in late January and therefore should be an accurate count. The plane was only flown over the southern management area and therefore the risk of missing new moult sites is present in the North. Although, in previous years the plane has contributed very few additional birds to the count with the use of drones and communicating with landowners resulting in changes detected.

With very low confidence in the southern count and the northern count being similar to the previous year, in addition to changes to the regulation in recent years, no changes should be made to the regulations until a higher confidence count is completed and the influence from the February/March season return is fully observed.

Staff Recommendations

- Retain current bag limits and season duration.
- Continue to promote the West Coast shelduck population as an underutilised resource and rewarding hunting opportunity.



Appendices

Appendix A: Aerial and ground counts of moult sites from 1993 to 2022.

NMU

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
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
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
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
Arnold River																											66	68	370	545
Ikamatua	1522	1500	2062	2500	2800	2200	1800	2000	2500	1900	1410	600	2500	1600	1200	1500	1000	1000	120	700	120	70	3	0	80	0	5	2	0	0
Ikamatua					600	550	400	400	1000	700	3	0	1000	1350	700	1500	1750	2000	1300	600	500	980	900	420	750	355	415	907	886	712
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
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
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
Glasseye Lake																												223	275	559
Virgin Flat																			700	650	600	450	580	700	124	218	195	53	136	53
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
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
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
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
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
Runanga Oxidation Ponds															0	0	250	400	400	300	80	300	200	400	350	350	429	987	561	461
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
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
Bell Hill house															0	0	450	500	400	190	1	300	290	17	8	0	178	730	1229	1291
Bell Hill New Pond																												159	12	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
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
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
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
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
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
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
Reefton Oxi ponds																					300	70	319	450	380	550	581	573	711	737
Camerons (new River pond)																							50	100	50	0	115	120	170	236
Reddale Pond																				1600	700	750	400	800	1100	200	360	398	968	529
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
Change		-1216	-1911	_	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
% 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

SMU

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
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
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
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
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
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
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
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
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
Cook River																					130	59	284	70	296	0	140	400	280	190
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
Arahura	0	0	0	0	0	0	0	200	390	780	88	230	280		500	900	1500	600	1200	920	500	665	450	184	422	450	384	710	800	600
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
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
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
Whataroa River																			50	0	110	0	66	170	0	10	14	0	60	160
Lake lanthe																			180	300	50	200	160	200	338	200	330	400	444	20
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
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
Poerua River pond																				70	18	0	65	60	140	0	70	30	75	45
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
Waiho River																								120	0	0	0	0	0	55
Taramakau																											100	40	50	
Total	1535	1848	1900	1966	2690	3292		3970	3500	4775	3946	4856				4985	6970	7429	7115	6165	6251	4235	5570	3577	6617	8960	5560	8427	8282	4879
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
% 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

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

	N	NZTM Map grid reference Northing Easting Northing								
Moult Area	Northing	Northing								
L. Haupiri	5286391.6	1492479.8								
L. Poerua	5270574.8	1476089								
Lake Brunner	5283205.2	1475503.2								
Ikamatua	5320364.6	1491629.2								
Ikamatua	5321226.3	1491977.2								
Barrytown Lagoon	5327157.7	1460956.3								
Karamea	5434333.2	1524774.8								
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								
manganua/Buner Bell Hill Airstrip	5288284.4	1479090.3								
Bell Hill House	5286461.7	1485843.4								
	5219923.9	1496637.4								
Waipuna Farm pond Waipuna Farm	5309914.6	1496662.7								
•	5280914.9	1480401.7								
Kangaroo Lake	5282324.1	1483041.4								
Lady Lake	5276598	1479592.2								
Lake Swan	5335951.8	1497432.6								
Mawheraiti	5277640	1454678.5								
Greenstone Pond	5339256.4	1508720.5								
Reddale Pond	5337230.4									
Reefton Ponds		1504823.3								
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								
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 lanthe	5230228.7	1406335.3								
Lake Mapourika	5199140.6	1372443.9								
Okarito Lagoon	5213936.1	1373735								
Wanganui Lagoon	5231805.4	1390435.9								
Poerua River pond	5222394.3	1393511.6								
Hari Hari farms	5224603	1403356.4								
Lake Kaniere	5252602.6	1449532.2								
Gillespies beach creek	5188677.5	1343434.5								
Camerons pond	5287587.5	1447367.5								