

# Migration Monitoring at Rocky Point Bird Observatory

Fall 2023

*David Bell*



## **Acknowledgements**

Rocky Point Bird Observatory acknowledges with respect Scia'new and T'Sou-ke First Nations on whose territory we work, as well as the many other Lekwungen and WSÁNEĆ peoples of the region. We recognize their leadership, and that of all indigenous peoples, for time immemorial to protect the land and water for the benefit of birds and people alike.

The support from the massive volunteer base is the cornerstone of Rocky Point's fall migration monitoring program. We are very much indebted to the scribes, extractors, census people, net menders, education program aides, bird walk leaders, bird bag washers and the many others that work so diligently to ensure RPBOs effective operation.

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## Summary

The 2023 fall migration monitoring season marked the 29<sup>th</sup> year of operation at the Rocky Point Bird Observatory (RPBO). Except for 2007, volunteers and staff have conducted monitoring of birds migrating through the most southerly point of Vancouver Island each fall since 1994. In 2023, 7383 birds were banded and 1588 recaptured between the two stations, Rocky Point and Pedder Bay.

While monitoring is focused on migratory songbirds, all birds noted passing through the two study sites are recorded. In addition to songbirds, significant numbers of Turkey Vultures (*Cathartes aura*), diurnal raptors, alcids, gulls, waterfowl, and shorebirds are recorded on an annual basis. Considering all birds recorded in the Daily Estimated Totals (DET) at both sites, 417,098 individual birds of 213 species were recorded over the course of the 2023 season.

In 2023, David Bell was the Bander-in-charge, with Evan Lewis and Emma Radziul joining as our other banders. We also had two interns; Mara Hanneson, for July and August with a part-time extension through the rest of the season, and Sonja Futehally for September and October. Additionally, James Kennerley joined in the new position of Science Program Manager, and assisted with banding throughout the season. An incredible 92 volunteers donated 5667 hours of their time and experience between the stations throughout the season.

Table 1. 2023 season totals by station.

	Total Banded	Species Banded	Total Recaptures	Species recaptured	Total birds DET	Total species DET
Rocky Point	4220	63	675	35	340,583	210
Pedder Bay	3163	62	913	32	76,515	147
<b>Total</b>	<b>7383</b>	<b>70</b>	<b>1588</b>	<b>41</b>	<b>417,098</b>	<b>213</b>

\*Note on nomenclature: All bird names follow the standard naming system as per the American Ornithological Society Checklist of North and Middle American Birds.

Cover photo: *Vesper Sparrow* (*Pooecetes gramineus*) at Rocky Point. Photo: David Bell.

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## **Part A - Rocky Point**

### 1.0 Introduction

The Rocky Point field station is located at the southernmost tip of Vancouver Island, British Columbia, on Department of National Defense property at Rocky Point. This property contains threatened Garry oak (*Quercus garryana*) meadow habitat, which is among the most diverse terrestrial ecosystems in British Columbia. Detailed site specifics can be found in Melcer and Nightingale (2009) and Murray (2006). A member of the Canadian Migration Monitoring Network (CMMN), RPBO is unique in being the only station located along the Canadian Pacific coast.

Migration monitoring commences on 21 July and ends after 90 days on 18 October annually. This period encompasses the majority of neotropical passerine migration through the southern portion of Vancouver Island along with the latter stages of the nesting season and the arrival of most overwintering species. Monitoring consists of a daily census along a standardized route at a set time, a standardized banding protocol, and the collection of general observations. Details of the monitoring protocol, which follow CMMN guidelines, can be found in RPBO (2022).



*Dawn at Rocky Point. Photo: David Bell.*

## 2.0 Banding Results

### 2.1 Coverage

In keeping with the protocol from previous years, 13 mist nets were operated in their standard locations. Of note, the odd-numbered nets were swapped after banding on 18 August from SpiderTech nets to Avinet nets, which have a smaller strand size. How this affects our capture rates is being studied (Appendix 3). Over the course of the season, Rocky Point had three full closure days for military activities on Bentinck Island: 16-18 October, resulting in 234 lost net hours. Due to a controlled burn on 22 September, monitoring activities were abbreviated, resulting in 40 lost hours. No days were significantly affected by weather (>1/3 net hours lost). In total, an additional 272.2 net hours were lost over the course of the season due to wind, rain, and other factors. Overall, the total of 6473.8 net hours was the sixth highest since standardization in 2000, and 743.8 above the average for this period (Table 2).

The high number of net hours were appreciated by our volunteers, who put in a phenomenal 2768.6 hours of their time to assist the banders and receive training in handling, banding, extracting, and identifying birds. Factoring in staff hours, the total personnel hours for the season were 3939.5.

Table 2. Coverage and banding totals for Rocky Point by year since standardization.

Year	Coverage period	Days Banded	Total Banded	Species	Net Hours	Birds/100 Net Hours
2023	21 July – 18 October	87	4220	63	6474	65.19
2022	21 July – 18 October	90	3790	62	6691	56.64
2021	21 July – 18 October	88	3576	63	6283	56.92
2020	21 July – 18 October	90	3624	63	6493	55.81
2019	21 July – 18 October	90	4378	59	6722	65.13
2018	21 July – 18 October	81	2929	68	5832	50.22
2017	21 July – 18 October	79	2791	61	4978	56.07
2016	21 July – 18 October	81	2761	57	5282	52.27
2015	21 July – 18 October	86	2938	59	5907	49.74
2014	21 July – 18 October	85	2694	65	5830	46.21
2013	21 July – 18 October	82	3189	59	5304	60.12
2012	21 July – 18 October	83	3191	63	5899	54.09
2011	21 July – 18 October	71	2734	59	5121	53.39
2010	21 July – 18 October	79	3193	64	5775	55.29
2009	21 July – 18 October	66	2801	59	4693	67.44
2008	21 July – 18 October	64	3211	56	4604	69.74
2006	21 July – 18 October	78	3068	60	5383	56.99
2005	21 July – 18 October	88	4615	58	6377	72.43
2004	21 July – 18 October	90	4001	57	6286	63.65
2003	20 July – 18 October	91	3716	61	6689	55.55
2002	20 July – 21 October	90	3153	56	6501	48.50
2001	23 July – 7 October	75	2576	64	4296	59.96
2000	21 July – 21 October	90	2723	57	5113	53.26
<b>Average 2000-2022</b>		<b>83</b>	<b>3257</b>	<b>60</b>	<b>5730</b>	<b>57.25</b>

## 2.2 Banding Totals

With the high number of net hours came a higher number of birds, with numbers slightly up from the last three years. A total of 4220 birds were banded, for a ratio of 65.19 birds/100 net hours, the third highest total and fourth highest ratio since standardization in 2000 (Table 2). Average numbers for fall monitoring since standardization are 3257 birds banded and a ratio of 57.25 birds/100 net hours.

Of the 4220 new birds banded, the top five most common species were Golden-crowned Sparrow (*Zonotrichia atricapilla*) – 391, White-crowned Sparrow (*Zonotrichia leucophrys*) – 363, Spotted Towhee (*Pipilo maculatus*) – 359, Ruby-crowned Kinglet (*Corthylio calendula*) – 283, and Western Flycatcher (*Empidonax difficilis*, formerly Pacific-slope Flycatcher) – 260. For a full account of birds banded see Table 3.

With an above-average year in terms of total numbers of birds in the nets, it is to be expected that several species were caught in well-above average numbers. These included Northern Saw-whet Owl (*Aegolius acadicus*), Downy Woodpecker (*Dryobates pubescens*), Steller’s Jay (*Cyanocitta stelleri*), Varied Thrush (*Ixoreus naevius*), American Goldfinch (*Spinus tristis*), Purple Finch (*Haemorhous purpureus*), White-throated Sparrow (*Zonotrichia albicollis*), White-crowned Sparrow, Golden-crowned Sparrow, and Western Tanager (*Piranga ludoviciana*). Overall, raptors, thrushes, finches, sparrows, tanagers, and grosbeaks had an above-average year in 2023, with a few exceptions.

Species that were significantly below average included Northern Flicker (*Colaptes auratus*), Hutton’s Vireo (*Vireo huttoni*), Red-breasted Nuthatch (*Sitta canadensis*), Pine Siskin (*Spinus pinus*), Brown-headed Cowbird (*Molothrus ater*), and MacGillivray’s Warbler (*Geothlypis tolmiei* – new record low). Additionally, Marsh Wren (*Cistothorus palustris*, average 7.0 per year, caught in 21 of the last 22 years) was notable for its absence from the nets. Overall, flycatchers, kinglets, and wrens were below average, with a few exceptions.



*Golden-crowned Sparrows were caught in record numbers this year at Rocky Point. Photo: David Bell.*

Table 3. Number of individuals banded at Rocky Point in 2023 compared with average annual catch. Species in bold represent first banding records for the site, totals with an asterisk are record highs.

Species	2023	Average (2000-2022)	% of Average
<b>Cackling Goose</b>	1*	n/a	1 <sup>st</sup> banding record
Anna's Hummingbird	2	1.1	176.0%
Rufous Hummingbird	6	11.0	54.3%
Sharp-shinned Hawk	4	3.9	103.5%
Cooper's Hawk	2	0.5	366.7%
<b>Great Horned Owl</b>	1*	n/a	1 <sup>st</sup> banding record
Barred Owl	3	1.8	169.2%
Northern Saw-whet Owl	9*	1.3	707.1%
Red-breasted Sapsucker	2	n/a	10 <sup>th</sup> -11 <sup>th</sup> banding records
Downy Woodpecker	7*	2.5	275.0%
Northern Flicker (Red-shafted)	1	1.9	53.7%
Willow Flycatcher	61	62.6	97.5%
Hammond's Flycatcher	13	21.0	62.0%
Western Flycatcher	260	271.9	95.6%
Hutton's Vireo	3	5.1	58.9%
Cassin's Vireo	1	1.1	88.0%
Warbling Vireo	39	17.2	227.0%
Steller's Jay	40	16.2	247.2%
Chestnut-backed Chickadee	45	61.0	73.8%
Bushtit	25	23.8	105.2%
Ruby-crowned Kinglet	283	338.1	83.7%
Golden-crowned Kinglet	81	101.4	79.9%
Red-breasted Nuthatch	4	6.7	59.5%
Brown Creeper	20	14.5	137.9%
House Wren	10	16.1	62.1%
Pacific Wren	122	156.6	77.9%
Bewick's Wren	33	34.5	95.7%
Gray Catbird	1*	n/a	2 <sup>nd</sup> banding record
Varied Thrush	12	5.3	227.6%
Swainson's Thrush	166*	85.4	194.5%
Hermit Thrush	57	92.8	61.4%
American Robin	28	21.7	129.1%
Cedar Waxwing	8	8.3	96.2%
Purple Finch	77	30.5	252.5%
Pine Siskin	3	7.7	39.1%
American Goldfinch	181*	73.7	245.7%
Chipping Sparrow	9	15	60.2%
Clay-colored Sparrow	3*	n/a	6 <sup>th</sup> -8 <sup>th</sup> banding records
Fox Sparrow	190	150.8	126.0%
Dark-eyed Junco (Slate-colored)	1	n/a	6 <sup>th</sup> banding record
Dark-eyed Junco (Oregon)	126	66.5	189.6%
White-crowned Sparrow (Unknown)	1	5.7	17.5%
White-crowned Sparrow (Gambel's)	27*	3.0	886.6%
White-crowned Sparrow (Puget Sound)	335*	143.0	234.3%
Golden-crowned Sparrow	391*	116.8	334.7%
White-throated Sparrow	15	7.0	215.7%
<b>Vesper Sparrow</b>	1*	n/a	1 <sup>st</sup> banding record
Savannah Sparrow	113	68.8	164.3%



Species	2023	Average (2000-2022)	% of Average
Song Sparrow	210*	132.8	158.1%
Lincoln's Sparrow	196	151.3	129.6%
Spotted Towhee	359*	136.1	263.7%
Red-winged Blackbird	4	6.6	60.3%
Brown-headed Cowbird	3	9.1	32.8%
Orange-crowned Warbler	123	167.5	73.5%
Nashville Warbler	1	0.5	220.0%
MacGillivray's Warbler	21	48	43.8%
Common Yellowthroat	105	72.5	144.8%
Yellow Warbler	118	146.1	80.7%
Chestnut-sided Warbler	1*	n/a	3 <sup>rd</sup> banding record
Palm Warbler (Western)	1	n/a	4 <sup>th</sup> banding record
Yellow-rumped Warbler (Audubon's)	19	11.2	169.2%
Yellow-rumped Warbler (Myrtle)	10	18.7	53.5%
Yellow-rumped Warbler (Unknown)	1	4.5	22.4%
Black-throated Gray Warbler	6	5.1	117.9%
Townsend's Warbler	6	5.9	102.3%
Wilson's Warbler	179	237.9	75.3%
Western Tanager	29*	2.1	1357.4%
Black-headed Grosbeak	4	2.0	195.6%
Hybrid Passerine	1	n/a	n/a
<b>Total</b>	<b>4220</b>	<b>3257</b>	<b>129.6%</b>



*MacGillivray's Warbler had a record-low year in 2023 for individuals banded at Rocky Point. Photo: David Bell.*

## 2.3 Recaptures

In addition to the new birds banded, Rocky Point had a total of 675 recaptures of 456 distinct individuals. Of these, 74 were from previous years, including a five-year-old Chestnut-backed Chickadee (*Poecile rufescens*) originally banded in 2018 (Table 4), and one, a Bewick's Wren (*Thryomanes bewickii*), was originally banded at our Witty's Lagoon MAPS (Monitoring Avian Productivity and Survivorship) site, 7.5 km away. The number of total recaptures in 2023 was much higher than the previous year, and the ratio of distinct to total recaptures was slightly lower, perhaps indicating that more birds were stopping over at the site, or that more resident birds were being caught repeatedly.

Table 4. Oldest recaptures from Rocky Point in 2023; hatch-years are in yellow, adults in green. Checkmarks indicate recapture of the bird in subsequent years.

Band #	Species	2018	2019	2020	2021	2022	2023	Age
2810-74798	Chestnut-backed Chickadee	HY	✓	✓	✓		✓	5
2920-50015	Chestnut-backed Chickadee		HY	✓	✓	✓	✓	4
2920-50243	Chestnut-backed Chickadee		HY	✓	✓	✓	✓	4
2951-16685	White-crowned Sparrow		HY	✓			✓	4
2951-18102	Song Sparrow		HY	✓			✓	4
2951-16630	Song Sparrow		HY	✓	✓	✓	✓	4
2981-15692	White-crowned Sparrow			AHY			✓	4+

The most recaptured individuals were a Bewick's Wren, three Song Sparrows (*Melospiza melodia*), a White-crowned Sparrow, a Golden-crowned Sparrow, and a Spotted Towhee each caught on six different days. A complete list of all recaptures from 2023, sorted by species, can be found in Table 5.

Table 5. Total recaptures at Rocky Point in 2023 by species.

Species	Total Recaptures	Species	Total Recaptures
Sharp-shinned Hawk	1	Purple Finch	7
Northern Saw-whet Owl	2	American Goldfinch	5
Northern Flicker	1	Chipping Sparrow	2
Willow Flycatcher	3	Fox Sparrow	46
Warbling Vireo	1	Dark-eyed Junco	8
Steller's Jay	4	White-crowned Sparrow	89
Chestnut-backed Chickadee	46	Golden-crowned Sparrow	41
Bushtit	6	White-throated Sparrow	2
Ruby-crowned Kinglet	22	Savannah Sparrow	1
Golden-crowned Kinglet	9	Song Sparrow	89
Brown Creeper	9	Lincoln's Sparrow	28
Pacific Wren	8	Spotted Towhee	80
Bewick's Wren	39	Orange-crowned Warbler	8
Varied Thrush	2	Common Yellowthroat	55
Swainson's Thrush	25	Yellow Warbler	3
Hermit Thrush	2	Wilson's Warbler	21
American Robin	4		

## 2.4 Capture Rate per Mist Net

Net placement is an important part of any mist netting operation, and in a passive migration monitoring setup, encompassing a variety of habitats is important. Nets such as 3, 4, 6, or 7 that are along edge habitats or that bisect narrow tracts of low-medium height vegetation, however, are more likely to provide higher capture rates than those in open areas (Nets 1 and 2), or that have a higher canopy and limited understory (Net 5).

As usual, the best net at Rocky Point in 2023 for new captures was Net 4 with 684; Net 1 usurped Net 7 for second spot this year with 582 (Table 6). Net 8 had the lowest number of new captures this year.

Table 6. Capture rates by net at Rocky Point in 2023.

RPBO Net	New captures	Recaptures	Total	% of Total	Species banded
1	582	62	644	13.2%	34
2	152	14	166	3.4%	21
3	475	70	545	11.1%	31
4	684	134	818	16.7%	42
5	150	25	175	3.6%	32
6	243	39	282	5.8%	31
7	544	108	652	13.3%	39
8	132	36	168	3.4%	28
9	207	24	231	4.7%	32
10	149	22	171	3.5%	26
11	234	46	280	5.7%	29
12	279	26	305	6.2%	36
13	388	67	455	9.3%	33
blank <sup>1</sup>	1	2	3	0.1%	1



Sunrise at Rocky Point. Photo: Evan Lewis.

<sup>1</sup> Net number not recorded in raw data

## 2.5 Peak Numbers

After the lowest first day ever, with only 28 new bands, capture rates remained mostly below average through to mid-August (Figure 1). With capture rates picking up late in August, we reached 1000 new birds banded right on the average date of 24 August. After a small dip in numbers in early September, an entire week of rainy nights late in the month stalled migrants, leading to our busiest day of the season on 29 September, with a record-breaking 235 birds banded. The following three days were our only other days above 100 new bands this season, leading to the two-week period of 21 September to 4 October being our busiest part of the season, with 1194 birds banded (28.3% of the season total). With periods of rain continuing through to the end of the season, daily banding totals were very inconsistent, with late season migrants likely stalled due to the weather.

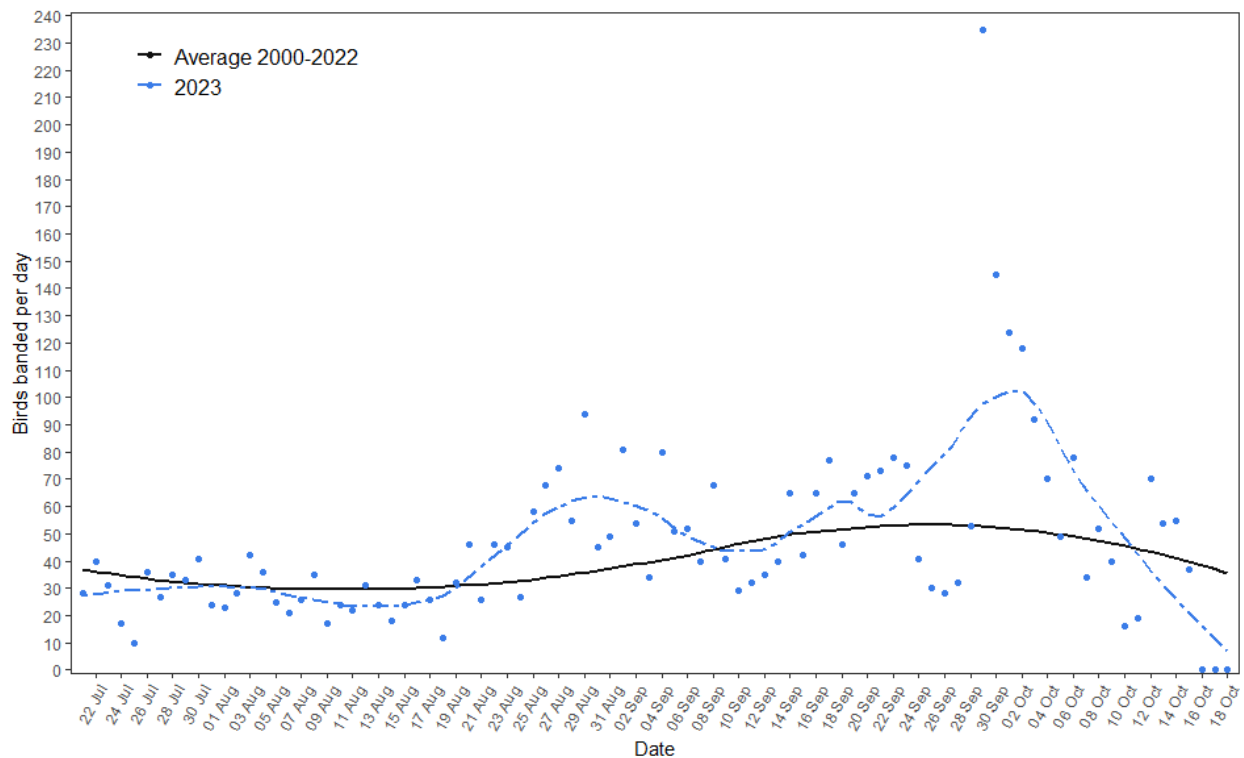


Figure 1. Scatterplot of total number of birds banded per day at Rocky Point in 2023. The dashed blue line represents a smoothed average of birds banded per day in 2023, while the solid, dark gray line represents a smoothed average of birds banded per day across all years. 22 September represents a partial closure day due to a controlled burn. 16-18 October represent closure days due to military activity.

### 3.0 Daily Estimated Totals

In addition to mist netting, Rocky Point staff and volunteers conduct a morning census and keep track of observations of all birds during the sampling period, which are then combined into the Daily Estimated Totals (DET) for each species. This provides a more thorough coverage of migration monitoring than can be achieved by banding alone. Over the course of the season, 417,098 individual birds of 210 species were recorded at Rocky Point. Breaking this down into loosely structured categories, Table 7 illustrates the numbers for six principal bird groups recorded at RPBO.

Table 7. Detections by bird grouping at Rocky Point in 2023.

Bird Grouping	Total Detections
Saltwater species (diving ducks, cormorants, grebes, gulls, alcids, etc.)	203,703
Freshwater waterfowl (dabbling ducks, geese)	6893
Diurnal raptors and vultures	14,085
Shorebirds	24,419
Aerial insectivores (swifts and swallows)	4180
Passerines and other landbirds (excluding aerial insectivores)	84,508

The “most abundant species” of 2023 were again topped by a non-species, with 72,502 detections of unidentified gulls; most of these were distant on Race Rocks or in the strait. Of the identified birds, California Gull (*Larus californicus*) came in at number one, with 44,368 detections. Glaucous-winged Gull (*Larus glaucescens*) – 32,896, Common Murre (*Uria aalge*) – 28,487, Red-necked Phalarope (*Phalaropus lobatus*) – 21,590, and Turkey Vulture – 19,998 rounded out the top five.

Thirteen species were detected on all 89\* days of migration monitoring in 2023. These were: California Gull, Glaucous-winged Gull, Great Blue Heron (*Ardea herodias*), Belted Kingfisher (*Megasceryle alcyon*), Downy Woodpecker, Northern Flicker, Common Raven (*Corvus corax*), Chestnut-backed Chickadee, Bewick’s Wren, European Starling (*Sturnus vulgaris*), American Robin (*Turdus migratorius*), Song Sparrow, and Spotted Towhee. A further six were detected on all but one day: Canada Goose (*Branta canadensis*), Black Oystercatcher (*Haematopus bachmani*), Red-breasted Nuthatch, Brown Creeper (*Certhia americana*), Purple Finch, and White-crowned Sparrow. At the other end of the spectrum, 33 species were recorded on just a single day, some of which appear in the highlights section later in this report.

A full breakdown of the DETs can be found in Appendix A.

\*Although no banding occurred due to military activities from 16-18 October, limited observations were possible on 17 and 18 October, giving us a sample of migration at the end of the season.

## **Part B – Pedder Bay**

### 4.0 Introduction

In 2023, RPBO operated the monitoring site at Pedder Bay for a 12<sup>th</sup> consecutive season. This station is located on the Pedder Bay Marina property and is situated within a boundary of Rocky Point Road, the RV resort and marina, a riparian area to the north in the vicinity of the Galloping Goose Trail, and estuarine habitat to the south. The area contains a diverse variety of habitats, including mixed woodland, old field, broom-dominated scrub, riparian, and estuarine.

The CMMN monitoring protocol is followed at Pedder Bay, and the monitoring period is identical to that of Rocky Point as stated above.

### 5.0 Banding Results

#### 5.1 Coverage

With only the weather influencing operations at Pedder Bay, coverage was somewhat better than at Rocky Point. Over the course of the season, no days were lost to, or significantly affected by, weather (>1/3 net hours lost). In total, 93.8 net hours were lost due to weather and other factors.

In keeping with past seasons, 15 mist nets were operated in their standard locations. In total, 8006.2 net hours accounted for the third-highest season total since Pedder Bay began operations, and the highest excluding the canopy net, which was only in operation for 2015 and 2016 (Table 8).

Over the 90 days of operation, volunteers contributed 2898.7 hours of their time; factoring in staff hours, the total personnel hours for Pedder Bay in 2023 came to 3867.1.

Table 8. Coverage and banding totals for Pedder Bay by year since inception. Asterisks indicate years in which the canopy net was used, accounting for the higher number of net hours.

<b>Year</b>	<b>Coverage period</b>	<b>Days Banded</b>	<b>Total Banded</b>	<b>Species</b>	<b>Net Hours</b>	<b>Birds/100 Net Hours</b>
2023	21 July – 18 October	90	3163	62	8006	39.51
2022	21 July – 18 October	90	3928	54	7999	49.10
2021	21 July – 18 October	89	2987	60	7832	38.14
2020	21 July – 18 October	90	3257	57	7623	42.73
2019	21 July – 18 October	90	3040	61	7872	38.62
2018	21 July – 18 October	90	2776	58	7833	35.44
2017	21 July – 18 October	88	3558	58	7390	48.14
2016	21 July – 18 October	86	2927	55	7152	40.93
2015	21 July – 18 October	89	3073	63	8218*	37.39
2014	21 July – 18 October	89	3074	61	8274*	37.15
2013	21 July – 18 October	87	3311	56	7673	43.15
2012	21 July – 18 October	87	2702	57	7621	35.45
<b>Average 2012-2022</b>		<b>89</b>	<b>3148</b>	<b>58</b>	<b>7749</b>	<b>39.71</b>

## 5.2 Banding Totals

Contrary to the Rocky Point station, the total number of birds banded was down this year compared to last, with 3163 new bands, the fifth highest total in 12 years of monitoring. The birds per net hour ratio was also down, with 39.51 birds per 100 net hours representing the sixth-highest total (Table 8).

Average numbers for fall monitoring are 3148 new bands and a ratio of 39.71 birds per 100 net hours. The top five species banded were: Fox Sparrow (*Passerella iliaca*) – 348, Swainson’s Thrush (*Catharus ustulatus*) – 347, Golden-crowned Sparrow – 241, Ruby-crowned Kinglet – 170, and Hermit Thrush (*Catharus guttatus*) – 169. For a full account of birds banded, see Table 9.

Despite the average year for birds banded, several species were caught in well above-average numbers, including Northern Saw-whet Owl, Downy Woodpecker, Steller’s Jay, Varied Thrush, and Western Tanager. Overall, raptors, woodpeckers, vireos, thrushes, finches, tanagers, and grosbeaks were above average in 2023, with a few exceptions.

Several species were caught in well below-average numbers this year, including Hairy Woodpecker (*Dryobates villosus*), Willow Flycatcher (*Empidonax trailli* – new record low), Red-breasted Nuthatch, Savannah Sparrow (*Passerculus sandwichensis*), Black-throated Gray Warbler (*Setophaga nigrescens* – new record low), and Wilson’s Warbler (*Cardellina pusilla* – new record low). In addition, Pine Siskin (average 5.6 per year, caught in eight of the past 11 years) was notable for its absence from the nets. Overall, flycatchers, warblers, and most sparrows were below average this year, with a few exceptions.



*A remarkable four Olive-sided Flycatchers (Contopus cooperi) were banded at Pedder Bay on consecutive days this year; there were only two banded at the site in the 11 years prior. Photo: James Kennerley.*

Table 9. Number of individuals banded at Pedder Bay in 2023 compared with average annual catch. Species in bold represent first banding records for the site, totals with an asterisk are record highs.

Species	2023	Average (2012-2022)	% of Average
Anna's Hummingbird	22	31.7	69.3%
Rufous Hummingbird	41	39.5	103.9%
Sharp-shinned Hawk	2	1.1	183.3%
Cooper's Hawk	1	1.5	68.8%
<b>Western Screech-Owl</b>	1*	n/a	1 <sup>st</sup> banding record
Barred Owl	1*	n/a	3 <sup>rd</sup> banding record
Northern Saw-whet Owl	7*	1.5	481.3%
Red-breasted Sapsucker	8	6.4	125.7%
Downy Woodpecker	10*	3.9	255.8%
Hairy Woodpecker	1	3.2	31.4%
Pileated Woodpecker	1*	n/a	3 <sup>rd</sup> banding record
Northern Flicker (Red-shafted)	4	4.5	88.0%
Northern Flicker (Intergrade)	3	1.0	300.0%
Olive-sided Flycatcher	4*	n/a	3 <sup>rd</sup> -6 <sup>th</sup> banding records
Willow Flycatcher	20	38.9	51.4%
Hammond's Flycatcher	10	13.5	74.3%
Western Flycatcher	66	98.7	66.9%
Hutton's Vireo	3	3.2	94.3%
Cassin's Vireo	3	1.7	173.7%
Warbling Vireo	25	13.5	184.6%
Steller's Jay	12	5.5	220.0%
Chestnut-backed Chickadee	37	55.0	67.3%
Violet-green Swallow	2	n/a	2 <sup>nd</sup> -3 <sup>rd</sup> banding records
Bushtit	52	31.4	165.8%
Ruby-crowned Kinglet	170	190.0	89.5%
Golden-crowned Kinglet	51	47.4	107.7%
Red-breasted Nuthatch	3	6.5	45.8%
Brown Creeper	11	11.9	92.4%
House Wren	14	22.5	62.1%
Pacific Wren	50	57.6	86.8%
Bewick's Wren	39*	31.5	124.0%
Varied Thrush	19*	4.4	435.4%
Swainson's Thrush	347*	185.0	187.6%
Hermit Thrush	169	174.2	97.0%
American Robin	92	75.5	121.8%
Cedar Waxwing	18	12.1	148.9%
House Finch	9	6.5	139.4%
Purple Finch	91	52.7	172.6%
American Goldfinch	13	7.8	166.3%
Chipping Sparrow	14	16.4	85.6%
Fox Sparrow	348	307.7	113.1%
Dark-eyed Junco (Slate-colored)	1	n/a	4 <sup>th</sup> banding record
Dark-eyed Junco (Oregon)	152	187.0	81.3%
White-crowned Sparrow (Unknown)	1	1.5	64.7%
White-crowned Sparrow (Puget Sound)	149	227.4	65.5%
White-crowned Sparrow (Gambel's)	8	3.8	209.5%
Golden-crowned Sparrow	241	179.4	134.4%
White-throated Sparrow	9	6.5	139.4%



Species	2023	Average (2012-2022)	% of Average
Savannah Sparrow	4	7.5	53.7%
Song Sparrow	151	153.0	98.7%
Lincoln's Sparrow	150	162.0	92.6%
Spotted Towhee	148	154.0	96.1%
<b>Red-winged Blackbird</b>	1*	n/a	1 <sup>st</sup> banding record
Brown-headed Cowbird	6*	2.2	275.0%
Orange-crowned Warbler	70	108.5	64.5%
Nashville Warbler	1*	n/a	3 <sup>rd</sup> banding record
MacGillivray's Warbler	32	51.3	62.4%
Common Yellowthroat	52	55.4	93.9%
Yellow Warbler	27	48.9	55.2%
Yellow-rumped Warbler (Audubon's)	8	12.8	62.4%
Yellow-rumped Warbler (Myrtle)	10	9.1	110.0%
Yellow-rumped Warbler (Unknown)	2	3.5	57.9%
Black-throated Gray Warbler	2	5.5	36.7%
Townsend's Warbler	7	7.0	100.0%
Wilson's Warbler	82	153.0	53.6%
Western Tanager	46*	23.2	198.4%
<b>Rose-breasted Grosbeak</b>	1*	n/a	1 <sup>st</sup> banding record
Black-headed Grosbeak	8	5.9	135.4%
<b>Total</b>	<b>3164</b>	<b>3148.3</b>	<b>100.5%</b>



*Black-throated Gray Warbler (RPBOs logo bird) was caught in record-low numbers at Pedder Bay this year. Photo: David Bell.*

### 5.3 Recaptures

As in previous years, Pedder Bay had a greater number of recaptures than Rocky Point, again suggesting that this site is more suitable as a stopover site for migrating birds. In 2023 there were 913 recaptures of 505 distinct individuals. Of these, 82 were inter-annual recaptures (banded in a previous year). These included a Fox Sparrow originally banded in 2015, making it eight years old (Table 10).

Table 10. Oldest recaptures from Pedder Bay in 2023; hatch-years are in yellow, adults in green. Checkmarks indicate recapture of the bird in subsequent years.

Band #	Species	2015	2016	2017	2018	2019	2020	2021	2022	2023	Age
2641-00451	Fox Sparrow	HY	✓	✓		✓				✓	8
2631-86307	Dark-eyed Junco				HY	✓	✓	✓	✓	✓	5
1372-14223	Spotted Towhee					HY	✓			✓	4
2791-50867	White-crowned Sparrow					HY				✓	4
2781-47998	Dark-eyed Junco					HY				✓	4
2920-01653	Chestnut-backed Chickadee					HY	✓		✓	✓	4

The most recaptured individual was a Song Sparrow that was caught on 11 different days, followed by four individuals captured on eight different days (three Song Sparrows and a Swainson’s Thrush). Table 11 lists all recaptures from 2023 sorted by species.

Table 11. Total recaptures by species at Pedder Bay in 2023.

Species	Total Recaptures	Species	Total Recaptures
Red-breasted Sapsucker	2	American Robin	16
Downy Woodpecker	3	Cedar Waxwing	2
Northern Flicker	1	Purple Finch	23
Willow Flycatcher	1	Chipping Sparrow	2
Western Flycatcher	1	Fox Sparrow	187
Steller’s Jay	3	Dark-eyed Junco	17
Chestnut-backed Chickadee	45	White-crowned Sparrow	27
Bushtit	23	Golden-crowned Sparrow	38
Ruby-crowned Kinglet	7	White-throated Sparrow	2
Golden-crowned Kinglet	5	Song Sparrow	106
Brown Creeper	6	Lincoln’s Sparrow	15
House Wren	1	Spotted Towhee	94
Pacific Wren	5	Orange-crowned Warbler	3
Bewick’s Wren	36	Common Yellowthroat	12
Swainson’s Thrush	167	Wilson’s Warbler	9
Hermit Thrush	52	Western Tanager	2

## 5.4 Capture Rate per Mist Net

As in previous years, Nets 7, 8, 14, and 15 were the most productive, accounting for 47.0% of new captures. These nets are all located in broom scrub with blackberries or other shrubs nearby. In 2023, Net 15 claimed top spot, with 495 total captures, while Net 14 came second with 472. Nets 1, 4, and 13, all located under tall trees, were once again our least productive nets (Table 12).

Table 12. Capture rate by net at Pedder Bay in 2023.

PEBA Net	New captures	Recaptures	Total	% of Total	Species banded
<b>1</b>	108	26	134	3.3%	23
<b>2</b>	145	48	193	4.7%	27
<b>3</b>	220	69	289	7.1%	35
<b>4</b>	61	33	94	2.3%	18
<b>5</b>	176	102	278	6.8%	29
<b>6</b>	196	109	305	7.5%	29
<b>7</b>	317	71	388	9.5%	43
<b>8</b>	361	36	397	9.7%	45
<b>9</b>	136	48	184	4.5%	32
<b>10</b>	231	89	320	7.8%	35
<b>11</b>	135	45	180	4.4%	23
<b>12</b>	184	47	231	5.7%	34
<b>13</b>	79	31	110	2.7%	21
<b>14</b>	373	99	472	11.6%	37
<b>15</b>	437	58	495	12.1%	48
<b>blank<sup>2</sup></b>	5	2	7	0.2%	4



*On 14 October, the crews and volunteers were treated to a partial annular solar eclipse; the darkened skies caused some birds to start singing and the local wolf pack to howl. Photo: James Kennerley.*

<sup>2</sup> Net number not recorded in raw data

## 5.5 Peak Numbers

As at Rocky Point, the season started off slow at Pedder Bay, with a below average first day, and numbers of new birds remaining mostly below average until late August (Figure 2). This led to our second-latest date to hit 1000 new birds banded, on 31 August (average 26 August). Numbers picked up significantly once the onset of peak migration hit in late August, and numbers of new birds remained mostly above average through September, other than the same dip in numbers around 10 September that Rocky Point experienced. After the week of rainy nights late in the month, 29 September was our busiest day at Pedder Bay this year, with 150 new birds banded. The next day was our only other day over 100 for the season, leading to the two-week period from 20 September to 3 October being our busiest part of the season, with 900 new birds banded (28.5% of the season total).

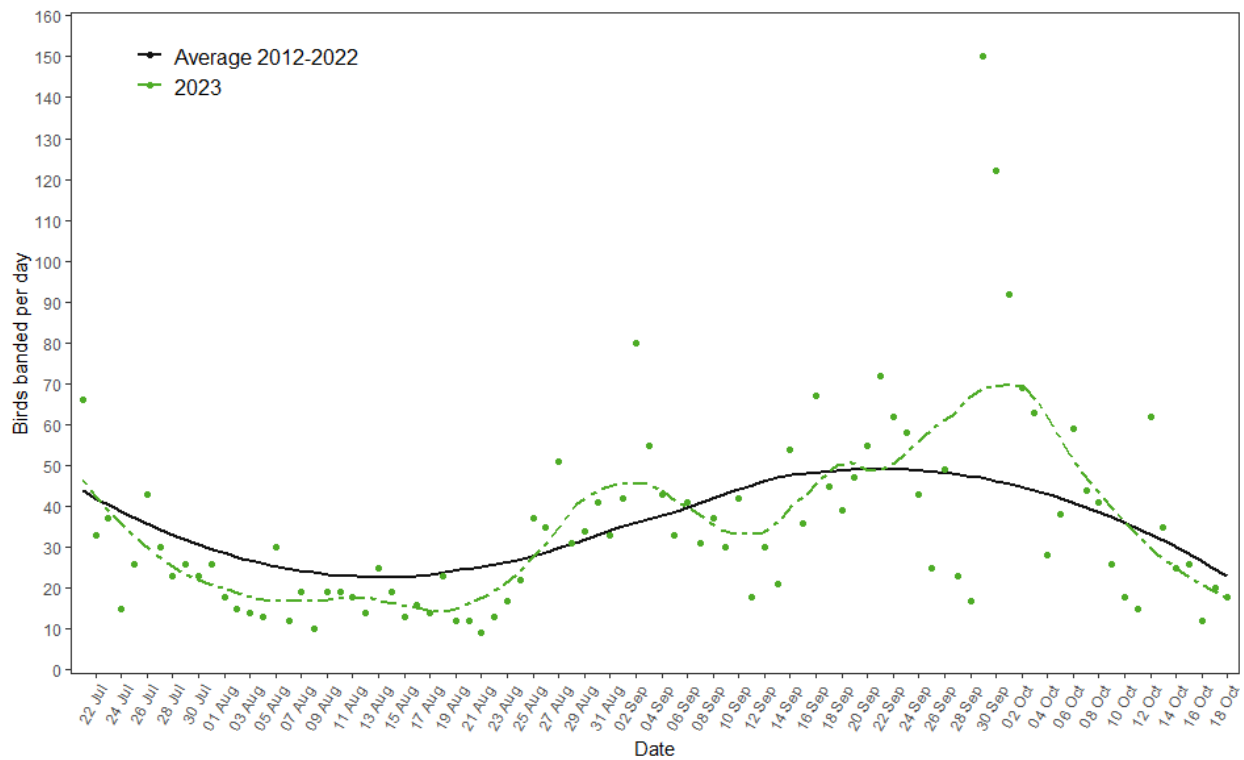


Figure 2. Scatterplot of total number of birds banded per day at Pedder Bay in 2023. The dashed green line represents a smoothed average of birds banded per day in 2023, while the solid, dark gray line represents a smoothed average of birds banded per day across all years. No days were significantly impacted by weather this year.

## 6.0 Daily Estimated Totals

The volume and diversity of birds are much lower at Pedder Bay than at Rocky Point, as it lacks the funnel effect of the point that concentrates birds, along with the shorebird and seabird opportunities that provide additional diversity. Still, it remains a good site for songbird monitoring, and over the course of the season, 76,515 birds of 147 species were recorded. A breakdown of detections by bird grouping can be found in Table 13.

Table 13. Detections by bird grouping at Pedder Bay in 2023.

Bird Grouping	Total Detections
Saltwater species (diving ducks, cormorants, grebes, gulls, alcids, etc.)	2001
Freshwater waterfowl (dabbling ducks, geese)	1341
Diurnal raptors and vultures	2998
Shorebirds	1089
Aerial insectivores (swifts and swallows)	3245
Passerines and other landbirds (excluding aerial insectivores)	63,205

The most numerous species recorded at Pedder Bay in 2023 was once again American Robin with 5994 detections. Golden-crowned Sparrow – 3585, European Starling – 2940, Chestnut-backed Chickadee – 2934, and Turkey Vulture – 2513 made up the rest of the top five.

Eighteen species were recorded on all 90 days that migration monitoring took place. These were California Quail (*Callipepla californica*), Eurasian Collared-Dove (*Streptopelia decaocto*), Anna’s Hummingbird (*Calypte anna*), Glaucous-winged Gull, Belted Kingfisher, Downy Woodpecker, Northern Flicker, Common Raven, Chestnut-backed Chickadee, Red-breasted Nuthatch, Brown Creeper, Bewick’s Wren, American Robin, House Finch (*Haemorhous mexicanus*), Purple Finch, Dark-eyed Junco (*Junco hyemalis*), Song Sparrow, and Spotted Towhee. At the other end of the spectrum, 22 species were recorded on just a single day, some of which are detailed in the highlights section below.

A complete list of totals for all species detected can be found in Appendix B.



*Watching the hordes of Steller’s Jays cache acorns kept us entertained through the later part of the season at both stations. Photo: David Bell.*

## Part C

### 7.0 A Comparison of the Two Sites

While geographic and habitat differences make a direct comparison between the two sites difficult, a few basic conclusions can be drawn from the data collected at each site. Consistent with multiple recent publications (e.g., Woodworth et al. 2014), birds seem to favour the inland location (Pedder Bay) over the coastal environment of Rocky Point as a stopover site, as shown by the percentage of recaptures at each site. In 2023, Pedder Bay had 30.0% more recaptures than Rocky Point, while banding 28.6% fewer birds. This discrepancy in recapture rates has been consistent over the 12 years that Pedder Bay has been in operation.

Comparing the overall age ratios between the sites showed a slight difference in 2023, with 15.4% of known-age birds at Rocky Point and 18.4% at Pedder Bay being adults.

Overall capture rates have been consistently higher at Rocky Point than Pedder Bay since the inception of the latter site in 2012, and 2023 was no different. Rocky Point had a capture rate of 65.19 birds/100 net hours, while Pedder Bay had a rate of 39.51 birds/100 net hours. At 60.6% of the capture rate at Rocky Point, Pedder Bay had the second-lowest ratio recorded, well below the 11-year average of 74.3% of the Rocky Point capture rate.

A brief outline of species considered by the Canadian Wildlife Service as priorities for monitoring that were banded at the two sites in 2023 can be found in Table 14.



*Early morning light and fall colours at Pedder Bay (left) and Rocky Point (right). Photos: David Bell.*

Table 14. Comparison of priority species: total number of birds banded, and number of birds banded per 100 net hours at each site in 2023.

Species	Banded		Banded/100NH		Species	Banded		Banded/100NH	
	RP	PB	RP	PB		RP	PB	RP	PB
Downy Woodpecker	7	10	0.11	0.12	Cedar Waxwing	8	18	0.12	0.22
Hairy Woodpecker	0	1	0.00	0.01	Purple Finch	77	91	1.19	1.14
Northern Flicker	1	7	0.02	0.09	Pine Siskin	3	0	0.05	0.00
Olive-sided Flycatcher	0	4	0.00	0.05	American Goldfinch	181	13	2.80	0.16
Western Wood-Pewee	0	0	0.00	0.00	Chipping Sparrow	9	14	0.14	0.17
Willow Flycatcher	61	20	0.94	0.25	Fox Sparrow	190	348	2.93	4.35
Western Flycatcher	260	66	4.02	0.82	Dark-eyed Junco	127	153	1.96	1.91
Hutton's Vireo	3	3	0.05	0.04	White-crowned Sparrow	363	158	5.61	1.97
Cassin's Vireo	1	3	0.02	0.04	Golden-crowned Sparrow	391	241	6.04	3.01
Warbling Vireo	39	25	0.60	0.31	White-throated Sparrow	15	9	0.23	0.11
Northern Rough-winged Swallow	0	0	0.00	0.00	Savannah Sparrow	113	4	1.75	0.05
Violet-green Swallow	0	2	0.00	0.02	Song Sparrow	210	151	3.24	1.89
Barn Swallow	0	0	0.00	0.00	Lincoln's Sparrow	196	150	3.03	1.87
Red-breasted Nuthatch	4	3	0.06	0.04	Spotted Towhee	359	148	5.55	1.85
Brown Creeper	20	11	0.31	0.14	Brown-headed Cowbird	3	6	0.05	0.07
House Wren	10	14	0.15	0.17	Orange-crowned Warbler	123	70	1.90	0.87
Pacific Wren	122	50	1.88	0.62	Common Yellowthroat	105	52	1.62	0.65
Marsh Wren	0	0	0.00	0.00	Yellow Warbler	118	27	1.82	0.34
Bewick's Wren	33	39	0.51	0.49	Yellow-rumped Warbler	30	20	0.46	0.25
Golden-crowned Kinglet	81	51	1.25	0.64	Black-throated Gray Warbler	6	2	0.09	0.02
Ruby-crowned Kinglet	283	170	4.37	2.12	Townsend's Warbler	6	7	0.09	0.09
Swainson's Thrush	166	347	2.56	4.33	Wilson's Warbler	179	82	2.76	1.02
Hermit Thrush	57	169	0.88	2.11	Western Tanager	29	46	0.45	0.57
American Robin	28	92	0.43	1.15	Black-headed Grosbeak	4	8	0.06	0.10

## 8.0 Temporal Changes in Diversity and Composition

Early in the season, most of the birds caught were local breeders undergoing their post-fledging (for hatch-years) dispersal, which accounts for high turnover. This high turnover rate is similar to true migration, which in late July is limited to just a few species. The “Puget Sound” subspecies of White-crowned Sparrows (*Zonotrichia leucophrys pugetensis*) are a good example of this, as they were among our most-caught birds during this early period. A few other species that were common in our nets during this dispersal phase included Song Sparrows and Swainson’s Thrushes. Early true migrants included Rufous Hummingbirds (*Selasphorus rufus*), Western Flycatchers and Wilson’s Warblers.

Later in August, warbler and flycatcher movement peaked as post-fledging dispersal gave way to true migratory movements. These species passed through quickly, and by the second week in September, many of the warblers and flycatchers were almost gone, giving way to peak movements of Swainson’s and Hermit thrushes and Lincoln’s Sparrows (*Melospiza lincolnii*). Late September through mid-October gave us big sparrow movements, with Fox, Song, and Golden-crowned sparrows, and Spotted Towhees, along with some lingering neotropical migrants. Later in October saw increased movements of Ruby- and Golden-crowned kinglets (*Regulus satrapa*) and Dark-eyed Juncos, although numbers of these species were likely still moving after the monitoring season was over, based on the trends shown in Figures 3 and 4.

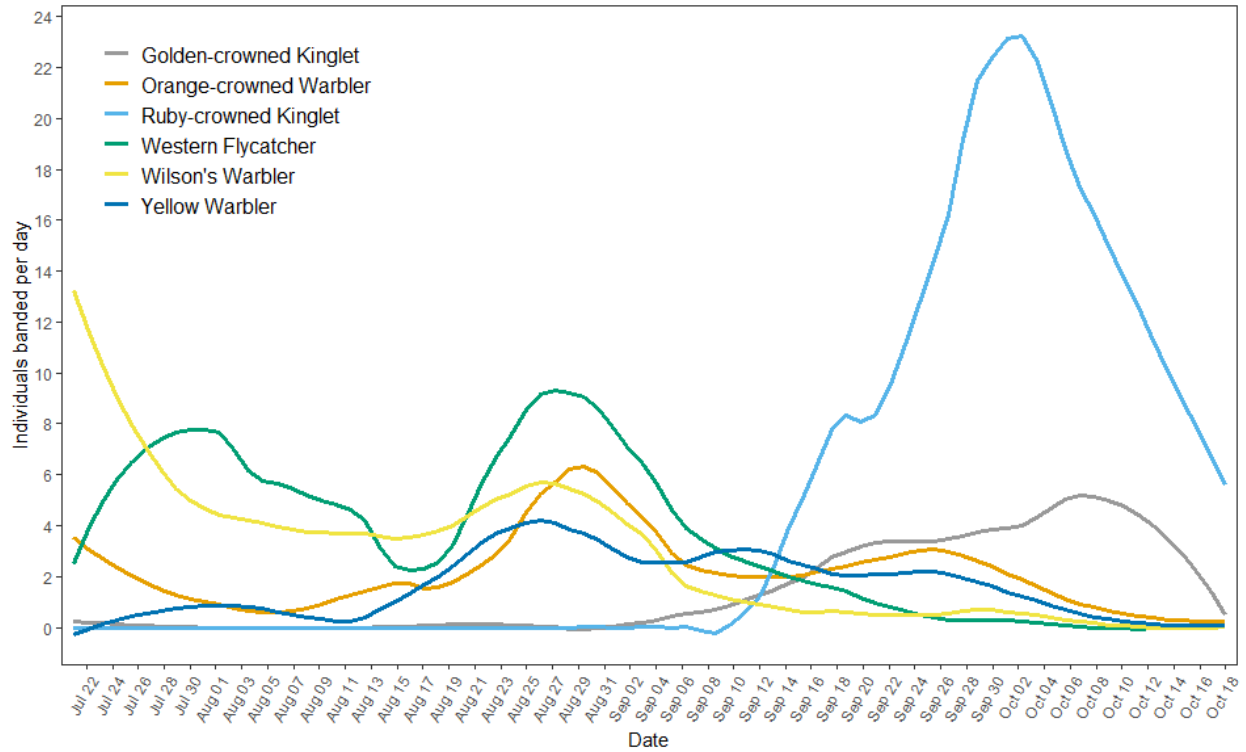


Figure 3. Migratory timing of six common insectivores, represented by smoothed averages of birds banded per day at both sites in 2023.

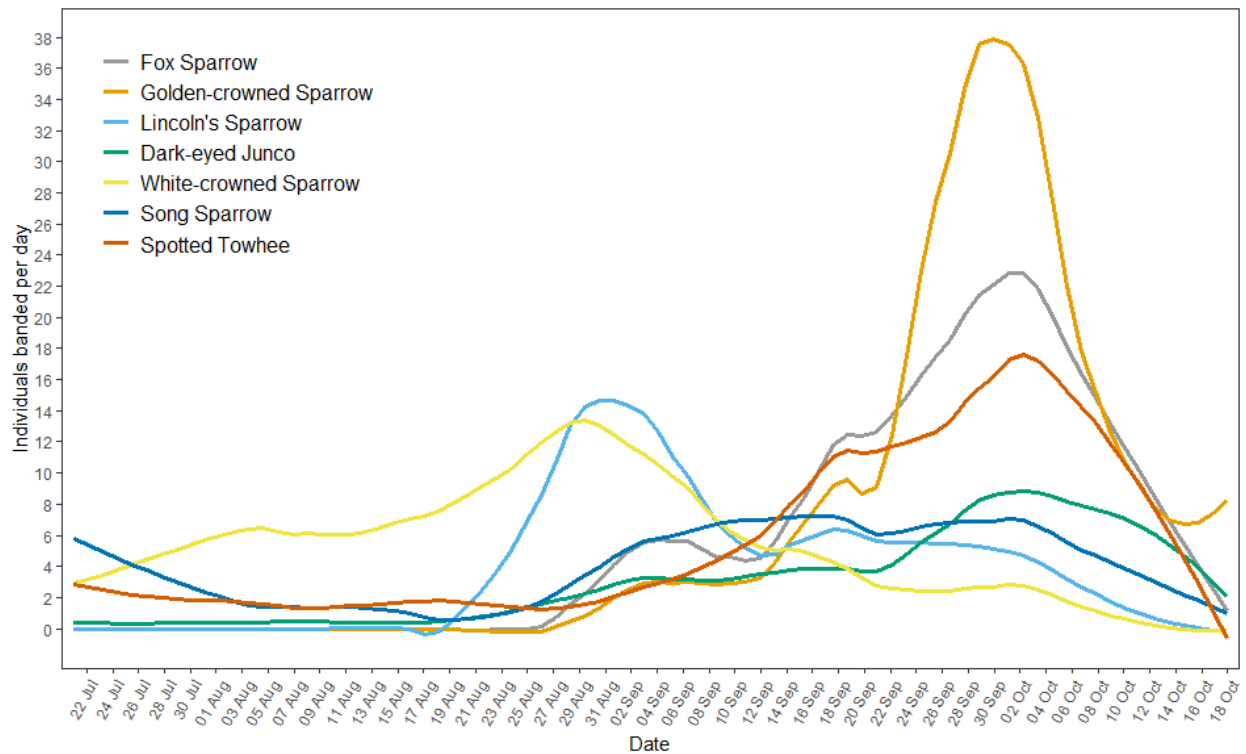


Figure 4. Migratory timing of seven common sparrows, represented by smoothed averages of birds banded per day at both sites in 2023.



## 9.0 Highlights

Every year at the stations has its highlights, and 2023 was exceptional in this regard, recording the highest-ever number of species during the monitoring period at both stations. The season got going right out of the gate with a Gray Catbird (*Dumetella carolinensis*) on 21 July at Rocky Point. This bird provided the second banding record for the program the next day and was seen and heard sporadically in the net lanes until 28 September. A Marbled Godwit (*Limosa fedoa*) was at Rocky Point on 22 July, and another or the same bird was at Pedder Bay on 23 July, providing a first record for that station. The third Rocky Point record of Northern Parula was found on census on 24 July and continued in the same location until 6 September. Also on 24 July at Rocky Point, the first Brown Pelican (*Pelecanus occidentalis*) of the season was seen; small numbers of this species were also seen there occasionally from 26 September to 12 October. Pedder Bay had a run of good banding records in late July, with the second Violet-green Swallow (*Tachycineta thalassina*) on 23 July, the third Violet-green Swallow on 24 July, the second and third Olive-sided Flycatchers on 25 July, and the fourth and fifth Olive-sided Flycatchers and first Red-winged Blackbird (*Agelaius phoeniceus*) on 26 July. The month finished off with a male Lazuli Bunting (*Passerina amoena*) at Rocky Point on 30 and 31 July.



From left to right: Gray Catbird, White-winged Crossbill and Northern Parula at Rocky Point. Photos: Jannaca Chick (left), Joachim Bertrands (centre, right).

Although the August doldrums once again prevailed this year, with lower-than-average numbers of birds in the nets, the streak of rare birds continued, likely partly fueled by large fires in the interior blanketing the province in smoke and displacing birds. The month kicked off with a White-winged Crossbill (*Loxia leucoptera*) at Rocky Point on 1 August, providing a third site record. A young Western Screech-Owl (*Megascops kennicottii*) found its way into a net at Pedder Bay on 7 August, providing a first site record as well as a first banding record for the migration program overall. A few scarce shorebirds turned up mid-month, with Baird's Sandpipers (*Calidris bairdii*) at Rocky Point on 11, 13, and 23 August, a Semipalmated Sandpiper (*Calidris pusilla*) at Pedder Bay on 14 August and seen sporadically until 21 August, and a flock of four Black-bellied Plovers (*Pluvialis squatarola*) at Pedder Bay on 20 August, providing a second site record. On 17 August, Pedder Bay got its third banding record of Pileated Woodpecker (*Dryocopus pileatus*), with a young male. The only Fork-tailed Storm-Petrel (*Hydrobates*

*furcatus*) of the season was seen at Rocky Point on 18 August, and a Northern Waterthrush (*Parkesia noveboracensis*) was there on 19 August. On August 23, a short seawatch turned up a flock of 62 Sabine's Gulls (*Xema sabini*), along with huge numbers of Red-necked Phalaropes streaming past; an estimated 15,000 by the end of the movement. Large numbers of this species continued in the area until 25 August. Also on 25 August, a Wandering Tattler (*Tringa incana*) was seen at Rocky Point while an Upland Sandpiper (*Bartramia longicauda*) was heard flying overhead there, for a second site record. On 28 August, a Sabine's Gull, a Bobolink (*Dolichonyx oryzivorus*) and an Eastern Kingbird (*Tyrannus tyrannus*) were at Rocky Point, and the month finished off with a Clay-colored Sparrow (*Spizella pallida*) there on 31 August, which continued the next day.



*Western Screech-Owl (left), Lark Sparrow (centre), and Chestnut-sided Warbler (right). Photos left to right: Mara Hanneson, Daniel Donnecke, David Bell.*

September again proved why it is known as 'rarity month' at RPBO, starting with a **Vesper Sparrow** banded at Rocky Point on 1 September, for a first station record and second banding record for the program. Also on 1 September at Rocky Point was the first Long-tailed Jaeger (*Stercorarius longicaudus*) of the season; further individuals of this species were observed on 4 and 18 September (two individuals), and 14 October. The first Lewis's Woodpecker (*Melanerpes lewis*) of the season was seen at Rocky Point on 2 September, followed by another at Pedder Bay from 14-19 September, another individual seen at Pedder Bay on 25 September, and possibly that same individual seen at Rocky Point from 25-30 September. A seawatch at Rocky Point on 4 September produced a Sabine's Gull and a Pink-footed Shearwater (*Ardenna creatopus*). On 7 September, a Bobolink was detected flying over Pedder Bay; about a half-hour later the same individual was detected flying over Rocky Point. Also at Rocky Point on 7 September was a Lazuli Bunting, and a Tennessee Warbler (*Leiothlypis peregrina*) was observed there on 8 September. Mid-month saw a flurry of unusual birds at Rocky Point, with a Red-throated Pipit (*Anthus cervinus*) on 13 September, a Say's Phoebe (*Sayornis saya*) on 15 September, the first **Lark Sparrow** (*Chondestes grammacus*) for RPBO on 17 September along with the sixth and seventh banding records of Clay-colored Sparrow, and observations of a Red Phalarope (*Phalaropus fulicarius*), two Pink-footed Shearwaters, and an American Goshawk (*Accipiter atricapillus*) on 18 September. A Great Horned Owl (*Bubo virginianus*) found its way into a net at Rocky Point on 20 September, for a first banding record for RPBO. Pedder Bay had a flyby flock of three Blue-winged Teal (*Spatula discors*) on 21 September, the first record for the monitoring program there and a fourth site record overall. Rocky Point banded its third Chestnut-sided Warbler (*Setophaga pensylvanica*) on 22 September, while Pedder

Bay got its third banding record of Nashville Warbler (*Leiothlypis ruficapilla*) on 24 September, an individual of the western 'ridgwayi' subspecies. Another American Goshawk was seen at Rocky Point on 26 September, while the second and final Northern Waterthrush of the season was seen there on 27 September; this species was unusually scarce this year. Along with the mass movement of birds on 29 September that led to a record-breaking day in the nets came a few good birds, with a Clay-colored Sparrow, the only Swamp Sparrow (*Melospiza georgiana*) detected this season, the third record of Blue-gray Gnatcatcher (*Polioptila caerulea*) for Rocky Point, and the first record of **Clark's Nutcracker** (*Nucifraga columbiana*) for RPBO. The month finished off with a Blue-winged Teal and the continuing Clay-colored Sparrow at Rocky Point and a flock of four Lesser Scaup (*Aythya affinis*) at Pedder Bay, the second record for the monitoring program there and fourth site record overall.



*Cackling Goose (left), Rose-breasted Grosbeak (centre), and Western Palm Warbler (right). Photos: Evan Lewis (left, centre), David Bell (right).*

With migration still going strong, October saw some highlights at both stations this year, starting with the eighth banding record of Clay-colored Sparrow for Rocky Point on 1 October: the continuing bird from 29 September, which was also seen on 2 and 4 October. Only slightly overshadowing the sparrow was the first **Rose-breasted Grosbeak** (*Pheucticus ludovicianus*) for Pedder Bay, also banded on 1 October; this individual represented a first banding record for the migration program as well. A Western Palm Warbler (*Setophaga palmarum palmarum*) was banded at Rocky Point on 2 October for a fourth banding record there, and another was seen at Pedder Bay on 4 October. At Rocky Point on 6 October were a Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*), two Rusty Blackbirds (*Euphagus carolinus*), and an American Goshawk, while Pedder Bay had a flyover pair of Gadwall (*Mareca strepera*), for a first site record during monitoring and second overall. On 7 October, the banders at Rocky Point had quite the surprise when a young 'minima' Cackling Goose (*Branta hutshinsii minima*) ended up in a net, representing a first banding record for RPBO. A storm system centred directly over Metchosin on 11 October produced an array of good birds at Rocky Point, with the season's only Cassin's Auklet (*Ptychoramphus aleuticus*), Black-legged Kittiwake (*Rissa tridactyla*), Northern Fulmar (*Fulmarus glacialis*), and Snow Bunting (*Plectrophenax nivalis*), a high count of 151 Lapland Longspurs (*Calcarius lapponicus* – the previous high count for the Capital Regional District on eBird was 18), the first record of Canvasback (*Aythya valiseneria*) for the migration monitoring program (third site record overall), and the first **Red Knot** (*Calidris canutus*) recorded at RPBO. A Nashville Warbler of the eastern 'ruficapilla' subspecies was banded at Rocky Point on 13 October, and the final unusual bird of the season was the first **Pine Grosbeak** (*Pinicola enucleator*) for RPBO there on 14 October.

## 10.0 Notes

A. Wild food crop: As usual in recent years, the blackberry (*Rubus spp.*) crop was abundant at Pedder Bay, and numbers of this plant are increasing at Rocky Point. The blackberries started ripening shortly after the season commenced and peaked in late August through mid-September. Ripe berries were present through to the end of the season, providing an important food source for sparrows, thrushes, and other lingering migrants. The arbutus (*Arbutus menziesii*) berry and conifer cone crops were above average in 2023, and the Garry oak acorn crop was plentiful during this past year.

B. Invasive plants: In both the front field (near the banding station and Nets 1-5) and the back field (north end of census area) at Rocky Point, the Scotch broom (*Cytisus scoparius*) and gorse (*Ulex europaeus*) are making a comeback after removal efforts by the DND during 2011-2015, however efforts began this year to remove these. In late September, invasive vegetation management was undertaken by DND personnel in the back field. This included burning most of the east meadow on both sides of the road. Two other invasives, the Canada thistle (*Cirsium arvense*) and coast tarweed (*Madia sativa*) were somewhat more abundant than in the last few years, with large patches scattered throughout the front field.

C. Other wildlife sightings: The Rocky Point property provides excellent habitat for a wide variety of wildlife. In 2023, in addition to the common mammal species, we had sightings of several Coastal Grey Wolves (*Canis lupus crassodon*). Offshore, transient Orca (*Orcinus orca*) pods were seen regularly, including in Eemdyk Passage. Humpback Whales (*Megaptera novaeangliae*) were also regular through the season, becoming more common in October. Rare insect sightings included good numbers of Black Saddlebags (*Tramea lacerata*), a species of migratory dragonfly that has been recorded breeding at this site in the past. Another insect of note was a Milbert's Tortoiseshell (*Aglais milberti*) at Pedder Bay in early October. European Mantises (*Mantis religiosa*) were again a regular fixture at both sites on sunny days in September and early October.



*Milbert's Tortoiseshell – a scarce butterfly on southern Vancouver Island. Photo: David Bell.*

## 11.0 Education Program

In 2023, the Education program was run with a full program for the first time since 2019, while the station was once again open for visits from the general public. Three school groups, totalling approximately 58 students, and four other groups, totalling 45 participants, were able to visit the banding station at Pedder Bay. Over the course of the season, 411 people were able to see live birds up close, learn about the banding process and bird conservation, and enjoy bird walks to see the local avifauna. Additionally, school groups had access to a specimen table where they could handle prepared specimens and learn about bird anatomy.



*Evan demonstrating the banding process to a visiting nature club at Pedder Bay. Photo: Rebecca Reader-*

## 12.0 Northern Saw-whet Owl Migration Monitoring Program

A more comprehensive look at results from the Northern Saw-whet Owl (*Aegolius acadicus*) monitoring program can be found in a separate report at <https://rpbo.org/resources/reports-publications/>. The following is a brief summary of the season.

Beginning on 15 September and ending 31 October each year, this program started at Rocky Point in 2002 and at Pedder Bay in 2014. The population of these small owls is cyclical, usually following a four-year pattern in response to small mammal populations. Owl numbers were up from last year, with Rocky Point banding 834 Northern Saw-whet Owls and Pedder Bay banding 621, for a total of 1455, the second-highest combined season total ever. Among the banded birds were three foreign recaptures: one from each of Cobble Hill, BC, Bainbridge Island, WA, and Bragg Creek, AB. Barred Owls were also up from last year, with 17 banded at Rocky Point and five at Pedder Bay for a total of 22. No unusual species of owls were captured this year. Only one bat was caught in the nets this year, a Little Brown Myotis (*Myotis lucifugus*). The owl banders were happy to welcome visitors this year; with limited group sizes, a total of 464 visitors were able to enjoy close-up views of the owls.



*Northern Saw-whet Owl. Photo: David Bell.*

## 13.0 Recommendations

As the only member of the Canadian Migration Monitoring Network on the Pacific coast, Rocky Point Bird Observatory collects valuable data on the fall migration of western bird species. It is recommended that RPBO continue its migration monitoring program at Rocky Point and Pedder Bay in 2024. Future projects to consider that would complement the current program include an official hawk watch and/or a general visible migration count at Rocky Point, similar to those of other stations in North America and elsewhere.

Part of the migration monitoring program involves training volunteers and potential future banders. As part of this, RPBO hired two interns in 2023; one for July and August with a part-time extension through to the end of the season, and one for September and October, giving them an opportunity to hone their skills and learn more advanced techniques and methods for running a station. As in past years with internships, this was a great success in 2023 with both interns greatly improving their skills in bird banding and identification. It is recommended that this program continue in the future, with a staffing total of four full-time banders (or three full-time banders with the Science Program Manager stepping in as needed) and one to two interns. These staffing totals are recommended to ensure sufficient coverage during migration monitoring, and to ensure that enough experienced personnel are on hand to train volunteers and interact with the public.

Over the past few years, the typical ‘winding-down’ of migration in early to mid-October has been less pronounced, with several species still moving through in numbers at the end of the season, and potentially having a significant portion of their numbers missed as a result (Figures 3 and 4). With climate change potentially changing many species’ migration timing and patterns, it is recommended that RPBO conduct an analysis on migration timing of common species at the sites, to see if it is worthwhile extending the season past 18 October. This could provide valuable data on migratory movements of late-season species, and as these data would not interfere with the standard season, they could easily be removed from analyses comparing all years.

During the 2023 migration season, the process to change the nets at Rocky Point from SpiderTech brand to Avinet brand was begun, with the initial change involving the odd-numbered nets. It is recommended that this process continue following the process outlined by the Canadian Migration Monitoring Network (Appendix 3).

A final recommendation is to look through reports from previous years for any unaddressed recommendations that could help RPBO improve its operations.

## 14.0 References

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## Appendix 1: Daily Estimated Totals for Rocky Point

Totals are in taxonomic order; total detections do not necessarily equate total individuals. Species in bold represent first site records.

Species	Total detections 2023	Days detected	Max count	Total detections by month			
				Jul.	Aug.	Sep.	Oct.
Snow Goose	128	9	46				128
Greater White-fronted Goose	862	19	298			488	374
Cackling Goose	1899	20	694			854	1045
Canada Goose	2384	88	95	328	974	726	356
Blue-winged Teal	1	1	1			1	
Northern Shoveler	15	7	8			3	12
Gadwall	2	2	1				2
American Wigeon	334	15	227		3	71	260
Mallard	213	52	15	19	64	83	47
Northern Pintail	497	26	372		41	32	424
Green-winged Teal	555	34	390		6	107	442
Unidentified dabbling duck	3	1	3				3
Canvasback	1	1	1				1
Ring-necked Duck	5	1	5				5
Greater Scaup	33	2	32				33
Lesser Scaup	35	1	35				35
Greater/Lesser Scaup	61	2	33				61
Harlequin Duck	40	17	9		1	16	23
Surf Scoter	1205	50	259	12	209	375	609
White-winged Scoter	115	18	54		5	45	65
Long-tailed Duck	3	2	2				3
Hooded Merganser	194	60	7	5	60	68	61
Common Merganser	1	1	1				1
Red-breasted Merganser	14	6	3			2	12
Unidentified duck	489	6	260		265	5	219
California Quail	917	73	42	154	417	275	71
Horned Grebe	3	2	2			1	2
Red-necked Grebe	35	18	8		3	9	23
Western Grebe	14	7	6			7	7
Rock Pigeon	4	2	3		4		
Band-tailed Pigeon	8200	85	449	57	2121	5257	765
Eurasian Collared-Dove	97	32	37	8	36	49	4
Mourning Dove	2	2	1		2		
Common Nighthawk	12	11	2	3	9		
Black Swift	15	4	7			15	
Vaux's Swift	1244	37	250	1	98	1082	63
Anna's Hummingbird	163	77	5	18	53	60	32
Rufous Hummingbird	94	28	11	42	50	2	
Virginia Rail	36	30	2	2	18	9	7
Sora	4	4	1	1	1	2	
Sandhill Crane	71	8	19			64	7
Black Oystercatcher	810	88	31	60	248	276	226
Black-bellied Plover	3	3	1		2	1	
Killdeer	229	79	16	21	87	66	55
Semipalmated Plover	38	19	5	8	26	4	
Upland Sandpiper	1	1	1		1		
Whimbrel	14	5	9		11	3	
Marbled Godwit	1	1	1	1			



Species	Total detections 2023	Days detected	Max count	Total detections by month			
				Jul.	Aug.	Sep.	Oct.
Short-billed Dowitcher	23	14	3	1	8	14	
Long-billed Dowitcher	8	5	3	1	1		6
Short-billed/Long-billed Dowitcher	27	2	26	1	26		
Wilson's Snipe	21	11	8		1	8	12
Red Phalarope	1	1	1			1	
Red-necked Phalarope	21,590	30	15,000		20,984	579	27
Red/Red-necked Phalarope	40	2	25		25	15	
Spotted Sandpiper	6	5	2	2	2	2	
Solitary Sandpiper	6	6	1		5	1	
Wandering Tattler	1	1	1		1		
Lesser Yellowlegs	13	10	3	1	8	4	
Greater Yellowlegs	82	52	6	10	44	20	8
Black Turnstone	105	27	13	7	39	18	41
<b>Red Knot</b>	1	1	1				1
Surfbird	58	11	30		8	2	48
Dunlin	10	3	7		1		9
Baird's Sandpiper	3	3	1		3		
Least Sandpiper	499	55	41	89	348	62	
Pectoral Sandpiper	2	2	1			1	1
Western Sandpiper	578	50	107	39	354	184	1
Semipalmated Sandpiper	2	1	2			2	
Unidentified small sandpiper ('peep')	235	21	60	4	139	89	3
Unidentified shorebird	12	1	12			12	
Long-tailed Jaeger	5	4	2			4	1
Parasitic Jaeger	20	9	7		5	12	3
Pomarine Jaeger	3	3	1			2	1
Rhinoceros Auklet	2101	78	600	85	1006	627	383
Cassin's Auklet	1	1	1				1
Marbled Murrelet	100	31	10	23	24	29	24
Pigeon Guillemot	953	68	75	294	537	73	49
Common Murre	28,487	86	2850	209	3905	12,511	11,862
Ancient Murrelet	7	4	2				7
Unidentified alcid	447	8	200		144		303
Black-legged Kittiwake	1	1	1				1
Sabine's Gull	64	3	62		63	1	
Bonaparte's Gull	2577	21	1165		13	17	2547
Heermann's Gull	2342	78	326	16	221	754	1351
Short-billed Gull	4594	72	525	3	409	1402	2780
Ring-billed Gull	7	7	1		2	2	3
Western Gull	17	11	4		3	3	11
Herring Gull	2	2	1				2
California Gull	44,368	89	5490	2318	7267	27,438	7345
Glaucous-winged Gull	32,896	89	4500	1255	5103	16,229	10,309
Iceland Gull	68	11	22			5	63
Hybrid gull	488	11	201		71		417
Unidentified gull	72,502	88	4500	1938	13,224	29,280	28,060
Caspian Tern	2	2	1		1	1	
Red-throated Loon	14	7	7			1	13
Pacific Loon	173	23	69		1	26	146
Common Loon	68	36	7	1	10	31	26
Fork-tailed Storm-Petrel	1	1	1		1		
Northern Fulmar	1	1	1				1
Pink-footed Shearwater	3	2	2			3	
Sooty Shearwater	53	6	37		1	15	37
Brandt's Cormorant	7089	65	1280	10	53	1360	5666

Species	Total detections 2023	Days detected	Max count	Total detections by month			
				Jul.	Aug.	Sep.	Oct.
Pelagic Cormorant	540	56	68	12	19	134	375
Double-crested Cormorant	1485	57	130	1	33	525	926
Unidentified cormorant	473	8	250	1	2	10	460
Brown Pelican	11	6	4	1		3	7
Great Blue Heron	401	89	9	60	133	125	83
Turkey Vulture	12,732	86	1700	66	231	6856	5579
Osprey	6	6	1		1	4	1
Northern Harrier	41	31	3	1	16	18	6
Sharp-shinned Hawk	396	59	51		20	245	131
Cooper's Hawk	278	60	29		20	148	110
American Goshawk	3	3	1			2	1
Bald Eagle	161	74	7	39	54	22	46
Broad-winged Hawk	40	16	8			35	5
Red-tailed Hawk	296	77	36	10	38	150	98
Great Horned Owl	99	57	4	9	46	36	8
Northern Pygmy-Owl	1	1	1		1		
Barred Owl	52	38	4	2	15	19	16
Northern Saw-whet Owl	16	10	3			7	9
Unidentified owl	1	1	1				1
Belted Kingfisher	213	89	5	26	92	64	31
Red-breasted Sapsucker	36	31	2	6	7	14	9
Lewis's Woodpecker	5	5	1			5	
Downy Woodpecker	522	89	20	77	205	144	96
Hairy Woodpecker	278	85	7	31	96	90	61
Pileated Woodpecker	123	72	4	8	39	58	18
Northern Flicker	1099	89	41	88	276	377	358
American Kestrel	27	19	3		3	17	7
Merlin	61	48	4	5	14	22	20
Peregrine Falcon	47	35	3		7	30	10
Olive-sided Flycatcher	297	41	16	152	142	3	
Western Wood-Pewee	128	35	8	48	78	2	
Willow Flycatcher	228	52	23	11	173	44	
Hammond's Flycatcher	129	49	11	3	44	80	2
Western Flycatcher	875	68	44	286	441	148	
Say's Phoebe	1	1	1			1	
Eastern Kingbird	1	1	1		1		
Hutton's Vireo	98	65	4	6	41	37	14
Cassin's Vireo	27	22	2	1	15	11	
Warbling Vireo	268	50	17	43	193	32	
Steller's Jay	4087	64	182		72	2829	1186
<b>Clark's Nutcracker</b>	1	1	1			1	
American Crow	102	26	49	8	60	19	15
Common Raven	1224	89	92	36	284	608	296
Chestnut-backed Chickadee	4212	89	82	527	1569	1429	687
Horned Lark	135	14	51			131	4
Tree Swallow	11	3	9	1	10		
Violet-green Swallow	1426	62	250	181	643	530	72
Purple Martin	329	51	21	39	213	77	
Northern Rough-winged Swallow	243	33	38	53	187	3	
Barn Swallow	833	57	65	144	594	95	
Cliff Swallow	74	21	14	10	64		
Unidentified swallow	5	2	4	4	1		
Bushtit	1630	82	51	315	614	458	243
Ruby-crowned Kinglet	1268	44	164			546	722
Golden-crowned Kinglet	2215	86	120	38	165	1068	944

Species	Total detections 2023	Days detected	Max count	Total detections by month			
				Jul.	Aug.	Sep.	Oct.
Red-breasted Nuthatch	815	88	30	102	347	279	87
Brown Creeper	1079	88	29	142	456	350	131
Blue-gray Gnatcatcher	1	1	1			1	
House Wren	211	57	13	69	108	34	
Pacific Wren	748	61	67	7	17	339	385
Marsh Wren	22	18	2	4	4	9	5
Bewick's Wren	976	89	24	139	349	338	150
European Starling	2487	89	180	177	1106	831	373
Gray Catbird	16	16	1	3	7	6	
Varied Thrush	594	42	85	2	1	299	292
Swainson's Thrush	752	81	38	75	340	312	25
Hermit Thrush	217	39	35			159	58
American Robin	4052	89	436	216	337	1962	1537
Cedar Waxwing	2685	85	95	310	1363	823	189
Red-throated Pipit	1	1	1			1	
American Pipit	1254	53	306		29	930	295
Evening Grosbeak	426	71	26	41	109	236	40
<b>Pine Grosbeak</b>	1	1	1				1
House Finch	172	51	26	19	33	34	86
Purple Finch	1965	88	110	122	440	1026	377
Red Crossbill	779	77	53	159	382	194	44
White-winged Crossbill	1	1	1		1		
Pine Siskin	5212	64	560	12	63	807	4330
American Goldfinch	3928	87	207	480	2458	791	199
Lapland Longspur	177	13	151			9	168
Snow Bunting	1	1	1				1
Chipping Sparrow	215	36	22	113	95	7	
Clay-colored Sparrow	9	8	2		1	5	3
<b>Lark Sparrow</b>	1	1	1			1	
Fox Sparrow	1015	48	106		12	518	485
Dark-eyed Junco (Slate-colored)	1	1	1				1
Dark-eyed Junco (Oregon)	1890	85	213	42	118	822	908
White-crowned Sparrow	4428	88	173	530	1802	1817	279
Golden-crowned Sparrow	4197	50	820		3	2242	1952
White-throated Sparrow	63	30	7			40	23
<b>Vesper Sparrow</b>	1	1	1			1	
Savannah Sparrow	3093	70	397	2	219	2601	271
Song Sparrow	1822	89	90	124	421	784	493
Lincoln's Sparrow	1582	58	286		178	1234	170
Swamp Sparrow	1	1	1			1	
Spotted Towhee	2525	89	132	94	404	1143	884
Yellow-headed Blackbird	1	1	1				1
Bobolink	2	2	1		1	1	
Western Meadowlark	9	3	6			9	
Red-winged Blackbird	1955	70	484	103	176	525	1151
Brown-headed Cowbird	133	29	11	85	43	3	2
Rusty Blackbird	2	1	2				2
Brewer's Blackbird	68	9	18		1	14	53
Unidentified blackbird	23	1	23			23	
Northern Waterthrush	2	2	1		1	1	
Tennessee Warbler	1	1	1			1	
Orange-crowned Warbler	585	82	30	78	258	221	28
Nashville Warbler	1	1	1				1
MacGillivray's Warbler	107	48	7	21	73	13	
Common Yellowthroat	831	85	28	76	423	299	33

Species	Total detections 2023	Days detected	Max count	Total detections by month			
				Jul.	Aug.	Sep.	Oct.
Northern Parula	17	17	1	7	9	1	
Yellow Warbler	836	79	57	39	439	335	23
Chestnut-sided Warbler	1	1	1			1	
Palm Warbler (Western)	1	1	1				1
Yellow-rumped Warbler (unk. ssp.)	685	45	106	8	16	474	187
Yellow-rumped Warbler (Myrtle)	238	27	38			92	146
Yellow-rumped Warbler (Audubon's)	831	79	132	31	85	552	163
Black-throated Gray Warbler	110	41	11	7	62	41	
Townsend's Warbler	247	66	17	36	116	91	4
Wilson's Warbler	824	71	42	240	472	110	2
Unidentified warbler	2	1	2			2	
Western Tanager	396	62	63	36	271	89	
Black-headed Grosbeak	92	40	9	29	52	10	1
Lazuli Bunting	3	3	1	2		1	
Hybrid passerine	1	1	1			1	
Unidentified passerine	1	1	1			1	

## Appendix 2: Daily Estimated Totals for Pedder Bay

Totals are in taxonomic order; total detections do not necessarily equate total individuals. Species in bold represent first site records.

Species	Total detections	Days detected	Max count	Total detections by month			
				Jul.	Aug.	Sep.	Oct.
	<b>2023</b>						
Snow Goose	37	5	17			13	24
Greater White-fronted Goose	10	4	6			3	7
Cackling Goose	346	7	115			155	191
Canada Goose	584	70	47	146	155	202	81
Blue-winged Teal	3	1	3			3	
Northern Shoveler	2	2	1			1	1
Gadwall	2	1	2				2
American Wigeon	3	1	3			3	
Mallard	66	23	20	2	13	18	33
Northern Pintail	232	5	121		121	35	76
Green-winged Teal	56	8	22			30	26
Greater Scaup	7	1	7				7
Lesser Scaup	4	1	4			4	
Hooded Merganser	1	1	1		1		
Common Merganser	25	4	15			10	15
Unidentified duck	20	5	7		8	12	
California Quail	2154	90	77	167	637	815	535
Rock Pigeon	10	5	4	1	6		3
Band-tailed Pigeon	1806	69	193	12	398	1350	46
Eurasian Collared-Dove	1476	90	50	145	526	575	230
Mourning Dove	3	3	1		3		
Common Nighthawk	87	40	5	24	62	1	
Black Swift	10	5	3			10	
Vaux's Swift	521	26	188	2	6	483	30
Anna's Hummingbird	627	90	23	55	190	249	133
Rufous Hummingbird	97	32	8	41	55	1	
Sandhill Crane	32	4	27			32	
Black-bellied Plover	4	1	4		4		
Killdeer	10	10	1	2	1	6	1
Semipalmated Plover	10	5	6		10		
Marbled Godwit	1	1	1	1			
Short-billed Dowitcher	12	5	4			12	
Long-billed Dowitcher	5	1	5				5
Wilson's Snipe	3	3	1			2	1
Spotted Sandpiper	14	12	2		8	4	2
Solitary Sandpiper	2	2	1		1	1	
Lesser Yellowlegs	1	1	1		1		
Greater Yellowlegs	15	14	2	1	8	5	1
Black Turnstone	2	1	2			2	
Least Sandpiper	532	32	85	9	497	26	
Western Sandpiper	448	22	80		383	65	
Semipalmated Sandpiper	5	5	1		5		
Unidentified small sandpiper ('peep')	25	4	10		22	3	
Pigeon Guillemot	3	2	2		3		
Common Murre	2	1	2			2	
Bonaparte's Gull	14	1	14				14
Heermann's Gull	1	1	1			1	
Short-billed Gull	32	12	6		3	7	22

Species	Total detections 2023	Days detected	Max count	Total detections by month			
				Jul.	Aug.	Sep.	Oct.
Ring-billed Gull	2	2	1		2		
California Gull	54	13	20		2	23	29
Glaucous-winged Gull	1368	90	74	85	395	483	405
Hybrid Gull	22	8	5		17	2	3
Unidentified gull	169	29	31	10	20	48	91
Pacific Loon	2	1	2			2	
Common Loon	10	6	4		1	7	2
Brandt's Cormorant	11	3	9			1	10
Double-crested Cormorant	254	29	36		4	165	85
Great Blue Heron	153	84	4	22	54	56	21
Turkey Vulture	2513	85	253	59	233	902	1319
Osprey	7	6	2	1	1	4	1
Northern Harrier	1	1	1			1	
Sharp-shinned Hawk	95	48	6		10	56	29
Cooper's Hawk	95	55	4	7	19	53	16
Unidentified accipiter	1	1	1			1	
Bald Eagle	112	62	4	24	39	16	33
Broad-winged Hawk	3	3	1			3	
Red-tailed Hawk	149	73	9	23	31	50	45
<b>Western Screech-Owl</b>	1	1	1		1		
Great Horned Owl	48	36	3	1	7	25	15
Northern Pygmy-Owl	26	20	3		7	11	8
Barred Owl	13	13	1	4	1	6	2
Northern Saw-whet Owl	20	12	3			13	7
Belted Kingfisher	284	90	5	37	114	87	46
Red-breasted Sapsucker	84	56	6	8	24	39	13
Lewis's Woodpecker	7	7	1			7	
Downy Woodpecker	393	90	9	53	127	143	70
Hairy Woodpecker	193	79	7	7	66	81	39
Pileated Woodpecker	130	71	4	10	38	55	27
Northern Flicker	934	90	21	93	251	352	238
American Kestrel	2	2	1			1	1
Merlin	15	14	2	1	7	5	2
Peregrine Falcon	5	4	2		1	3	1
Olive-sided Flycatcher	173	28	12	100	72	1	
Western Wood-Pewee	7	5	2	3	4		
Willow Flycatcher	154	48	15	59	79	16	
Hammond's Flycatcher	61	28	9		15	46	
Western Flycatcher	370	57	24	125	199	46	
Unidentified <i>Empidonax</i>	1	1	1			1	
Hutton's Vireo	77	53	4	2	26	28	21
Cassin's Vireo	41	26	5	6	23	11	1
Warbling Vireo	148	51	10	23	94	31	
Steller's Jay	2105	71	104	6	101	1308	690
American Crow	667	83	54	129	262	203	73
Common Raven	815	90	36	81	188	313	233
Chestnut-backed Chickadee	2934	90	63	271	1101	997	565
Horned Lark	1	1	1			1	
Tree Swallow	7	3	5		7		
Violet-green Swallow	731	53	53	325	279	120	7
Purple Martin	1131	51	84	103	744	284	
Northern Rough-winged Swallow	77	21	15	6	69	2	
Barn Swallow	758	48	53	178	515	65	
Cliff Swallow	6	4	2	4	1	1	
Unidentified swallow	4	1	4			4	

Species	Total detections 2023	Days detected	Max count	Total detections by month			
				Jul.	Aug.	Sep.	Oct.
Bushtit	1667	88	52	266	582	521	298
Ruby-crowned Kinglet	776	40	70			358	418
Golden-crowned Kinglet	1894	79	118	30	110	776	978
Red-breasted Nuthatch	682	90	17	70	248	224	140
Brown Creeper	603	90	18	51	225	219	108
House Wren	178	53	11	35	122	21	
Pacific Wren	464	65	31	10	22	146	286
Bewick's Wren	958	90	24	129	364	308	157
European Starling	2940	89	147	217	1008	1095	620
Varied Thrush	576	50	44		6	292	278
Swainson's Thrush	1330	84	85	132	459	673	66
Hermit Thrush	541	47	42		1	359	181
American Robin	5994	90	310	351	596	3066	1981
Cedar Waxwing	1900	83	80	260	793	803	44
House Sparrow	320	49	25	106	126	43	45
American Pipit	183	30	33		2	112	69
Evening Grosbeak	291	68	29	99	61	89	42
House Finch	1974	90	56	175	542	773	484
Purple Finch	1451	90	70	109	247	697	398
Red Crossbill	382	67	30	68	157	118	39
Pine Siskin	1179	45	150	3	19	213	944
American Goldfinch	2197	84	77	505	1279	363	50
Lapland Longspur	2	2	1			1	1
Chipping Sparrow	139	32	15	83	50	6	
Fox Sparrow	1758	51	100		6	937	815
Dark-eyed Junco (Slate-colored)	1	1	1			1	
Dark-eyed Junco (Oregon)	2284	90	130	55	216	1082	931
White-crowned Sparrow	2522	89	82	240	1037	1137	108
Golden-crowned Sparrow	3585	47	264			1488	2097
White-throated Sparrow	48	25	6			38	10
Savannah Sparrow	243	51	26		34	183	26
Song Sparrow	1693	90	48	133	389	733	438
Lincoln's Sparrow	757	59	67		134	543	80
Spotted Towhee	2465	90	84	150	568	1036	711
Bobolink	1	1	1			1	
Red-winged Blackbird	1224	79	121	72	514	338	300
Brown-headed Cowbird	185	45	14	49	129	7	
Brewer's Blackbird	1221	80	52	196	623	283	119
Unidentified blackbird	2	1	2			2	
Orange-crowned Warbler	465	81	40	76	238	135	16
Nashville Warbler	1	1	1			1	
MacGillivray's Warbler	98	43	7	22	66	9	1
Common Yellowthroat	339	69	17	26	140	163	10
Yellow Warbler	385	61	38	2	212	163	8
Palm Warbler	1	1	1				1
Yellow-rumped Warbler (unk. ssp.)	189	38	22	1	7	105	76
Yellow-rumped Warbler (Myrtle)	106	20	17			61	45
Yellow-rumped Warbler (Audubon's)	329	49	49	4	32	265	28
Black-throated Gray Warbler	70	34	10	1	37	32	
Townsend's Warbler	206	60	17	5	96	91	14
Wilson's Warbler	435	66	16	107	252	73	3
Unidentified warbler	7	2	6	6		1	
Western Tanager	353	64	21	45	196	112	
<b>Rose-breasted Grosbeak</b>	<b>1</b>	<b>1</b>	<b>1</b>				<b>1</b>
Black-headed Grosbeak	114	45	8	45	52	17	

## Appendix 3. Protocol and notes on switching mist net type at Rocky Point station

### Text by Science Program Manager James Kennerley

Each year, wear and tear from daily use means that mist nets require continuous maintenance to repair holes and fix broken shelf strings and loops. However, mist nets eventually reach a point when they must be replaced due to irreparable damage.

At our Rocky Point station, SpiderTech nets have been used since 2004, but with the company ceasing operations, the decision was made to switch to a different supplier. Avinet was selected as its mist nets are already in use during migration monitoring at Pedder Bay. Furthermore, using the same mist nets at both migration monitoring stations is logistically easier with purchasing and will ensure the most comparable data between the two sites. The specifications of the two net types are similar, with both having a length of 12 m with 30 mm Nylon mesh and four shelves; the differences are that SpiderTech nets are 3.0 m tall with 110-denier threads, while Avinet nets are 2.6 m tall with 70-denier threads, making them slightly smaller and lighter with shallower pockets.

As a Canadian Migration Monitoring Network (CMMN) member station, RPBO follows the standardized Migration Monitoring Protocol used at stations across Canada which includes using the same types of nets year-to-year to minimize variation in capture totals due to changing methodology. Due to the insolvency of our mist net supplier, continuing to use the same types of mist nets is not possible. Because of this, we need to ensure a smooth transition from using SpiderTech mist nets to Avinet mist nets, so that data collected in the future can be compared with previously collected data and form part of a continuous dataset.

Following email discussions with Dr. Erica Dunn (Science Advisory Committee, CMMN), RPBO has established a protocol to transition from using SpiderTech mist nets to Avinet mist nets (Table 15). The three-year process to switch all nets means there will be a two-year period with both types of mist net in operation. This will provide a way to understand how capture rates differ between net types while controlling for year-to-year variables such as migration activity and weather. Once the transition is complete, RPBO will analyze whether capture rates differ between the two types of mist nets and the potential implications this could have on the RPBO migration monitoring dataset.

**Table 15.** Steps for transitioning from using SpiderTech mist nets to Avinet mist nets at Rocky Point.

Step	Year	Even numbered nets	Odd numbered nets
1	2023	SpiderTech	Avinet
2	2024	Avinet	SpiderTech
3	2025	Avinet	Avinet

On 18 August 2023, the process of switching nets began with SpiderTech mist nets taken down from odd numbered net lanes after the standard banding period and replaced with Avinet mist nets. In 2024, Step 2 will be taken at the beginning of the migration monitoring season rather than part way through. Step 3 will commence at the start of the 2025 migration monitoring season.