



BRUCE PENINSULA BIRD OBSERVATORY

THE VOICE OF BIRDS ON THE BRUCE

MIGRATION MONITORING AT CABOT HEAD

FALL 2023

by

Stéphane Menu, Ph.D.
121 Sunset Boulevard
Georgian Bluffs, Ontario N0H 2T0
stefmenu@gmail.com

*prepared
for*

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Citation:

Menu, S. September 2023. Migration Monitoring at Cabot Head, Fall 2023. Unpublished report for Bruce Peninsula Bird Observatory

Preface

Cabot Head is a promontory of the northeast headland of the upper Bruce Peninsula in south-central Ontario. Cabot Head Research Station (CHRS) is situated on the western side of Wingfield Basin (at 45°15'N, 81°18'W) near the community of Dyer's Bay. In 2001, Cabot Head was designated as an Important Bird Area (IBA) by Birdlife International for its significant concentrations of migratory bird species. Both Ontario Parks and Bruce Peninsula Bird Observatory (BPBO) manage the CHRS.

The Breeding Bird Survey (BBS) is the principle method for monitoring bird populations in the United States and southern Canada. However, breeding ranges of many species in northern Canada are inaccessible to roadside surveys and are therefore poorly monitored by the BBS method. The Canadian Migration Monitoring Network (CMMN) is a nation-wide, Bird Canada-led initiative intended to assess changes in bird populations during migration. There are about 25 stations across Canada where data are collected for each bird species during the spring and fall migrations, typically through a standardized capture and observation protocol. Through continuous data collection since 2002, BPBO has demonstrated that Cabot Head is a significant site for monitoring migratory landbirds. In recognition of its importance and established migration monitoring effort, BPBO became a member of the CMMN in fall 2003.

Migration monitoring has been the primary focus of bird research at Cabot Head since 1998. BPBO was incorporated as a non-profit charitable organization in 2001 to initiate and direct ornithological assessments and monitoring at Cabot Head and surrounding areas. This document reports on results of the fall 2023 migration monitoring season at the CHRS.

Executive Summary

In this document are summarized the results of migration monitoring at Cabot Head in fall 2023. Fieldwork began on August 15 and ended on October 31 for a total of 78 consecutive days of coverage. An above-average total of 145 species was detected during the monitoring period this fall (range of 120 to 154 species in 2002 - 2022). A complete list of all species observed, with season estimated totals, days with observation, maximum and minimum daily totals, is provided in Appendix I. For a casual view of the fall 2023 season, an edited version of the blog is reproduced in Appendix II. A total of 2121 birds of 70 species were banded, the fourth highest ever, and 310 birds of 33 species were recaptured. Recapture data suggest that overall stopover rates at Cabot Head are usually low but vary between species and seasons.

Fall 2023 was a very good migration season overall, as reflected both in the total numbers of birds banded and in daily observations. Bad weather, mostly in the form of strong winds sometimes accompanied by rain, completely precluded banding on 10 days during the season (above the 2003-2022 average of 9.3 ± 4.9 days, range 1 - 22 days). Complete daily coverage for banding (i.e., 90 mist net hours, or six hours for all the 15 nets) was 30 days, quite similar to the average, representing 38% of the season (2003-2021 average of 32.2 ± 8.5 days, range 21 - 47). The banding total of 2121 birds in fall 2023 is the fourth highest in 22 years of monitoring, but about 800 birds less than the previous - record - season of 2022. Banding totals for the last three fall seasons, including 2023, have exceeded 2000 birds, as well as in the fall seasons of 2005, 2011, and 2012 (2002 - 2022 average of 1713 ± 458 banded birds). Almost half (47%) of the banding total in fall 2023 was comprised of five species: Golden-crowned Kinglet, (about 15% of the total), Red-eyed Vireo, (14% of the total), Slate-colored Junco, (5%), American Tree Sparrow and Black-throated Green Warbler (about 5% each). There was a total of 12 days with banding counts of over 50 birds per day, including the season record of 103 birds of 11 species on October 23. Banding totals of less than 30 birds occurred on about half the days with full banding coverage (14 of 30 days). On September 4, 50 species were detected, the highest diversity total of the fall and another 13 days had diversity counts between 40 and 49 species, including 41 species on October 12.

The 2023 fall migration monitoring season was a success thanks to the dedication and efforts of the six volunteer field biologists who contributed their time to this project.

1. Methods

The migration monitoring program at Cabot Head, like all CMMN stations, follows a field protocol as it is essential for the production of population indices that data collection be consistent over the long term. At CHRS, 15 mist nets are operated for a maximum of six hours per day starting 30 minutes before sunrise, weather permitting. Personnel also complete a census done for one hour along a fixed route starting an hour after sunrise, when all birds seen or heard are recorded. Supplemental surveys such as visible migration counts and bay watches are completed when circumstances permit, but casual observation occurs throughout the entire count period of seven hours.

2. Season Summary

Coverage

Fieldwork for fall migration monitoring began at CHRS on August 15 and ended on October 31, for a total of 78 consecutive days. Census and casual observation were performed every day. Banding is more affected by weather, such that there was a total of 10 days without any banding. Across the season, 26% of mist netting coverage (in hours) was lost. The number of days with complete coverage (i.e., 15 nets open for six hours) was around average (30 out of 78, i.e., 38%, compared to an average of $42\% \pm 11$; Fig.1).

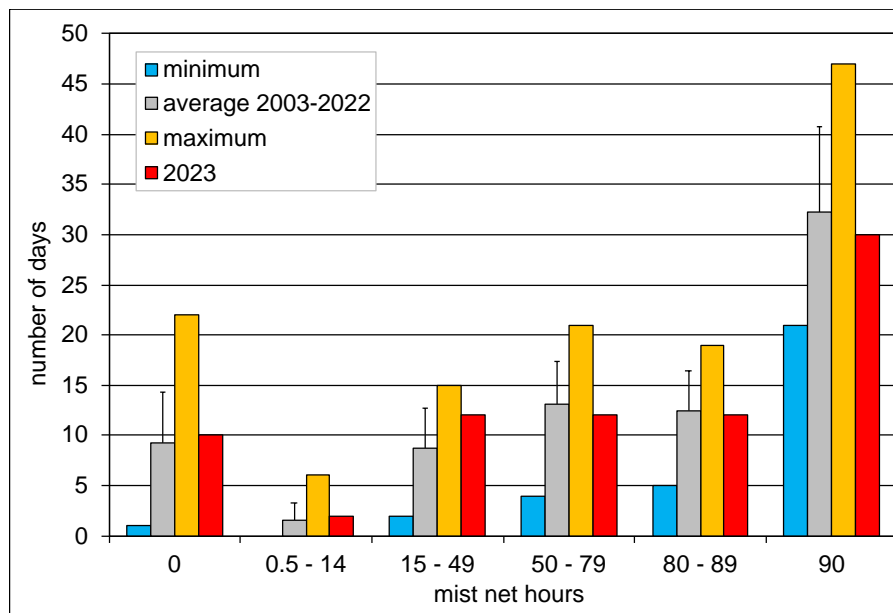


Figure 1. Coverage (in mist net hours) at CHRS, fall 2023.

Weather

Weather in fall 2023 was mostly warm, unseasonably so in late September and early October. The season regularly experienced strong winds and precipitation, which variably impacted mist-netting activities. There were 15 days with precipitation during the monitoring period (i.e., the seven hours from half an hour before sunrise), the vast majority of them in October (notably two periods of four days of rain each; Fig.2), with only one day of short-lasting showers in September and three days with precipitation in August. Rain tremendously affects migration, grounding birds and impacting their foraging abilities. Periods of high wind may have opposite effect on migrating birds: a strong headwind likely stops birds from flying long distances, whereas a tailwind is very favourable to migrating birds.

Along with rain, wind is a major factor that influences migration. It is difficult to accurately quantify such a dynamic component of the weather, especially because wind force and direction are recorded only at the start and end of the count period. To characterize wind force (on the Beaufort scale) and direction, we considered only the highest wind speed attained during the count period of seven hours. Undoubtedly, this method tends to over-estimate wind force. However, the effect of strong winds can probably be felt before they develop into a full windstorm. This fall, strong winds (at least five on the Beaufort scale) occurred on 36 days (46% of the season) and were almost equally from the south and north (43% and 33% of the days with strong wind, respectively). Another 25 days (32%) experienced moderate wind speeds (three to four on the Beaufort scale; Fig.2). As a whole during the season, east winds occurred during 19% of the days, slightly more than west winds (13%) but much less frequently than north (27%) and south (32%) winds. There were large swings of temperature in late October, with a thunderstorm on October 24 and a high of 15°C contrasting with snow squalls all morning on October 31 and temperatures barely above the freezing point.

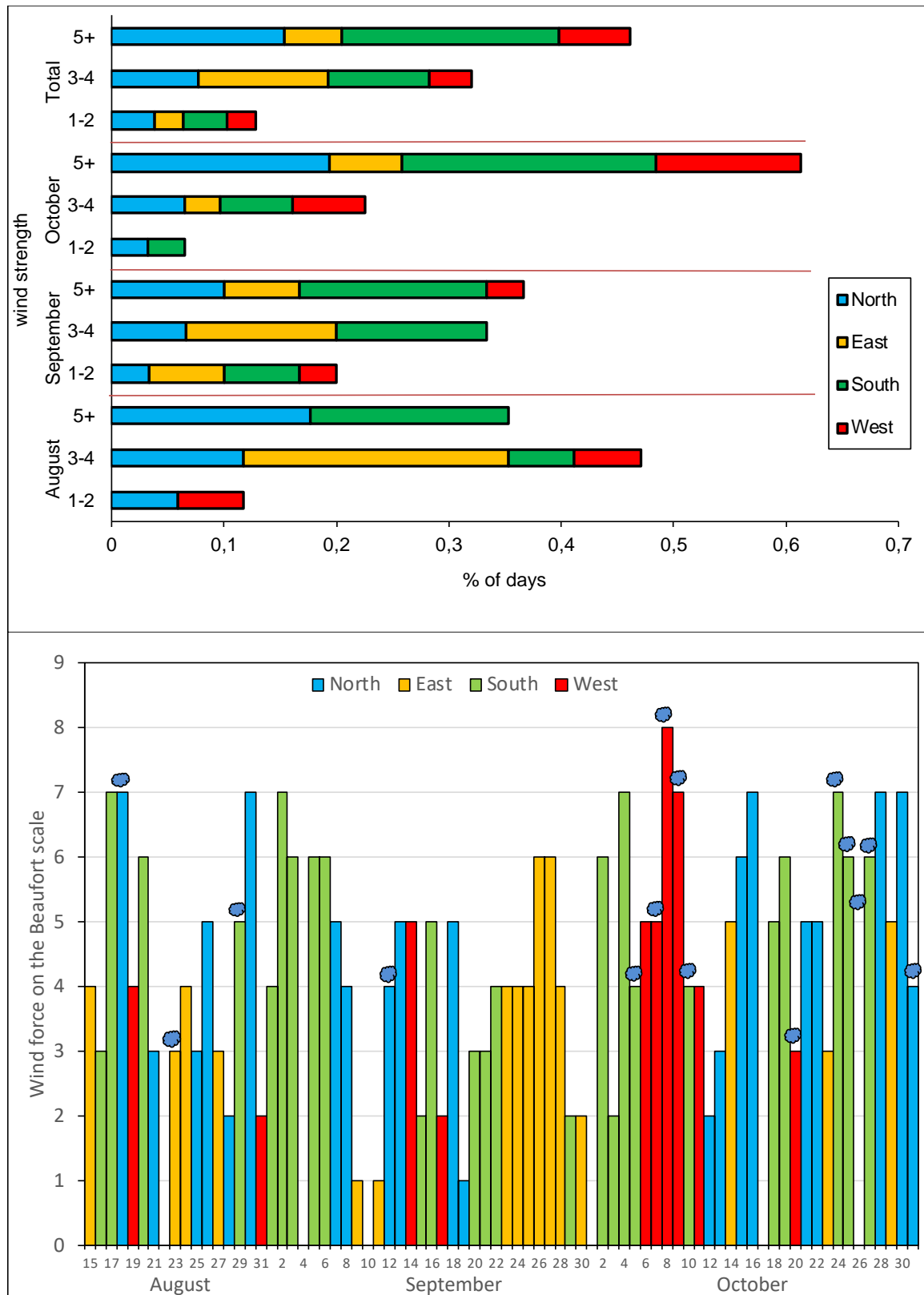


Figure 2. Wind pattern: strength on the Beaufort scale, direction and proportion of time (top) and on a daily basis (bottom; clouds indicate days with precipitation) at CHRS, fall 2023.

Migration Monitoring

Migration Overview

Migration is an inherently dynamic phenomenon, greatly influenced by weather and food availability (both operating at different spatial scales). Fall 2023 at Cabot Head was marked by good diversity and high numbers of birds captured and banded throughout the season. A migration overview can be expressed graphically depicting daily numbers of visibly migrating songbirds and species (Fig.3) and banded birds (Fig.4), with the most numerous species highlighted. Finally, days of bad weather may be, in part, illustrated with counts of daily mist net hours (Fig.5). A closer look at a few special days, the “boom” and “bust” days of migration, reveal the sheer magnitude of bird movement and also its inherent variability. There were 14 days with more than 40 species detected - one in October - with the most diversity on September 4 with 50 species. On that day, 12 species of warblers were detected (about half of the season total of 23 species), as well as five species of sparrows and four of woodpeckers. Banding was also quite successful on that day, with a total of 70 birds of 27 species, notably a record 31 Red-eyed Vireo (in a record season for that species).

From September 1 to 5, 77 species were detected in total, the peak period of diversity for the season. This is the period when the passage of long-distance migrants is in full display, involving a wide range of bird families and groups (flycatchers, vireos, warblers, thrushes, etc.). Notably, a total of 20 species of warblers was observed during this five-day period, including a season high of 26 American Redstart on September 4. The long-distance migrants are rapidly replaced by the short-distance migrants in mid-September, when sparrows, kinglets, finches, and a few warblers (notably Yellow-rumped - or Myrtle - Warbler) become dominant (Fig.3). A first influx of Pine Siskin was evident in the second half of September, with daily totals above 100 and a high of 125 birds on September 23, but this species dominates even more at the end of October, with large flocks present during several days (and a season high of 420 birds on October 22).

Nonetheless, the last 12 days of monitoring (October 20 onwards) are usually the least diverse, with species daily total ranging from 18 to 26 this fall. There were tremendous variations between days in species observed, with only six species seen on each of the 12 days, while 21 species were detected only once, resulting in 62 species overall during this 12-day period.

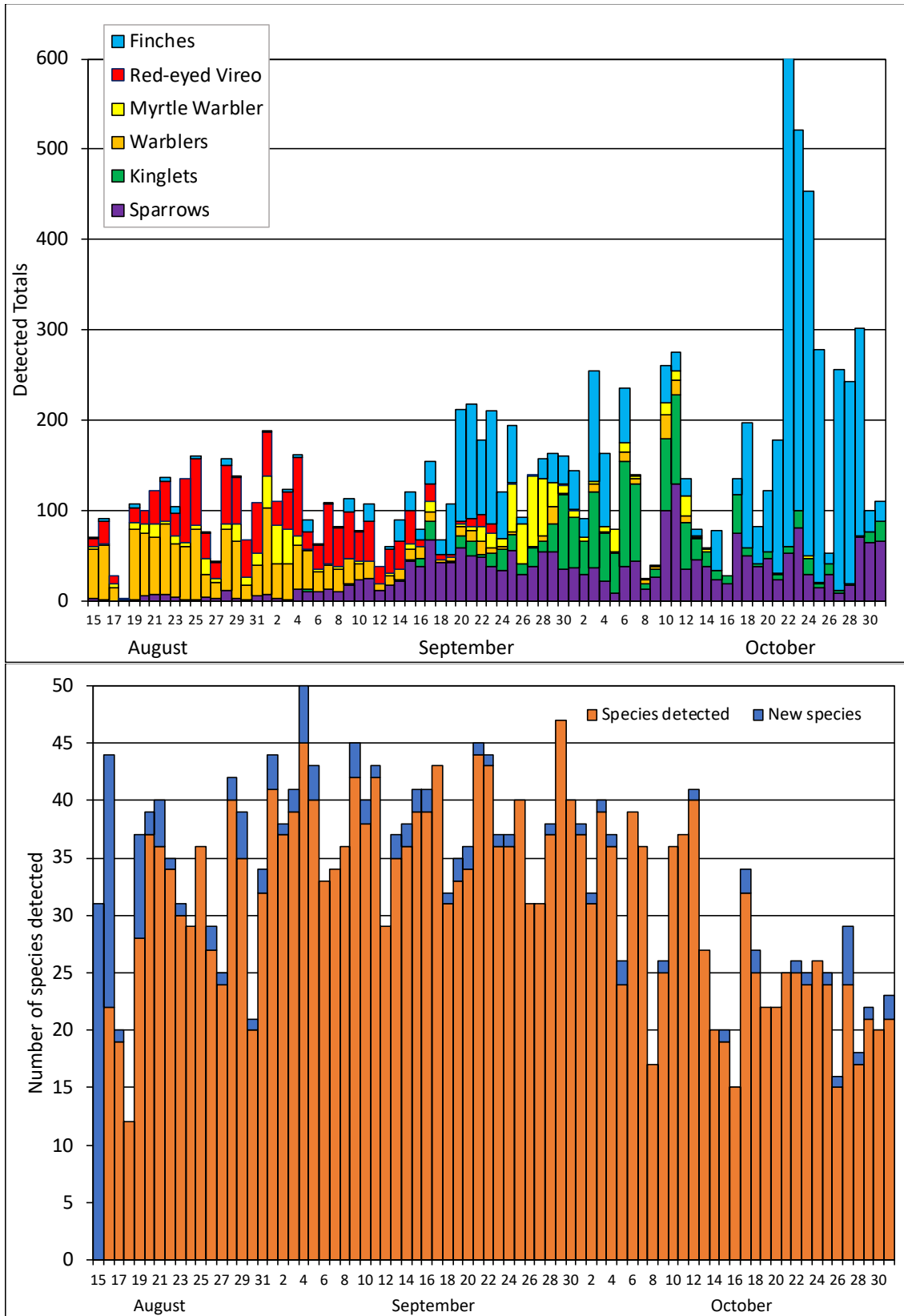


Figure 3: Detected totals (top) and diversity (bottom) at CHRS, fall 2023.

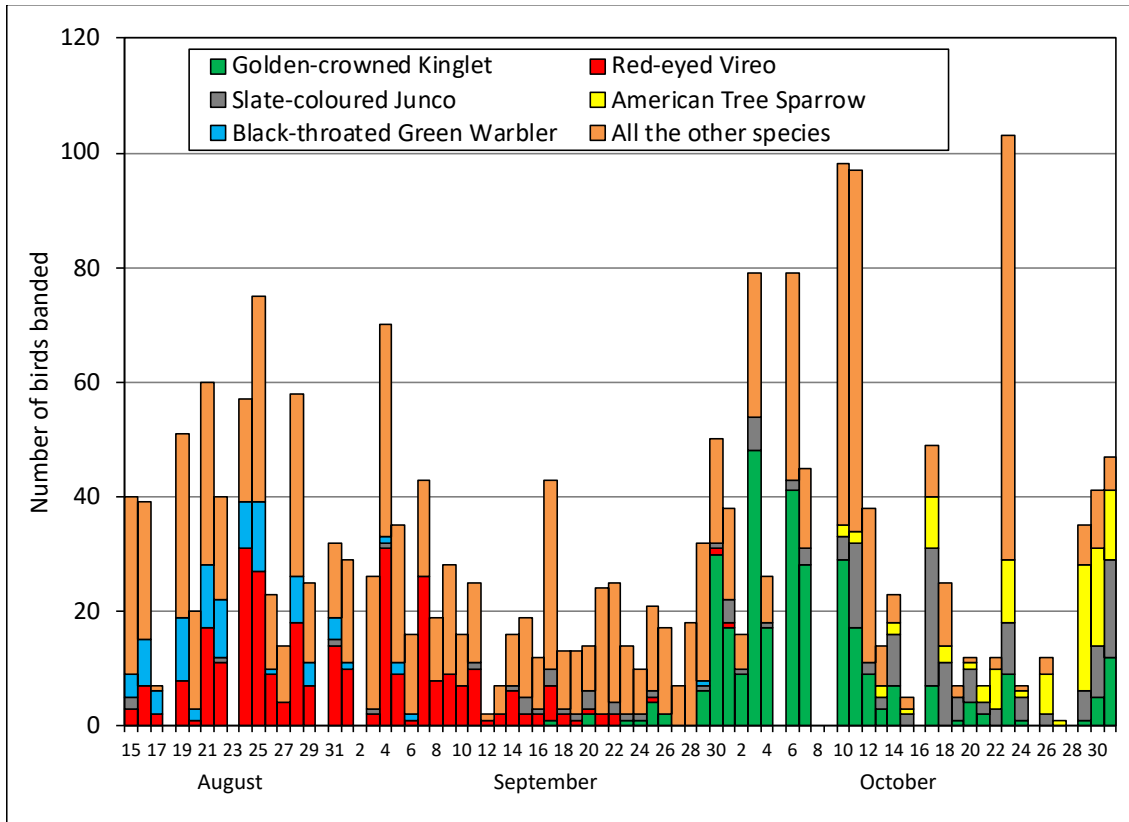


Figure 4: Daily banding totals at CHRS, fall 2023, with selected species.

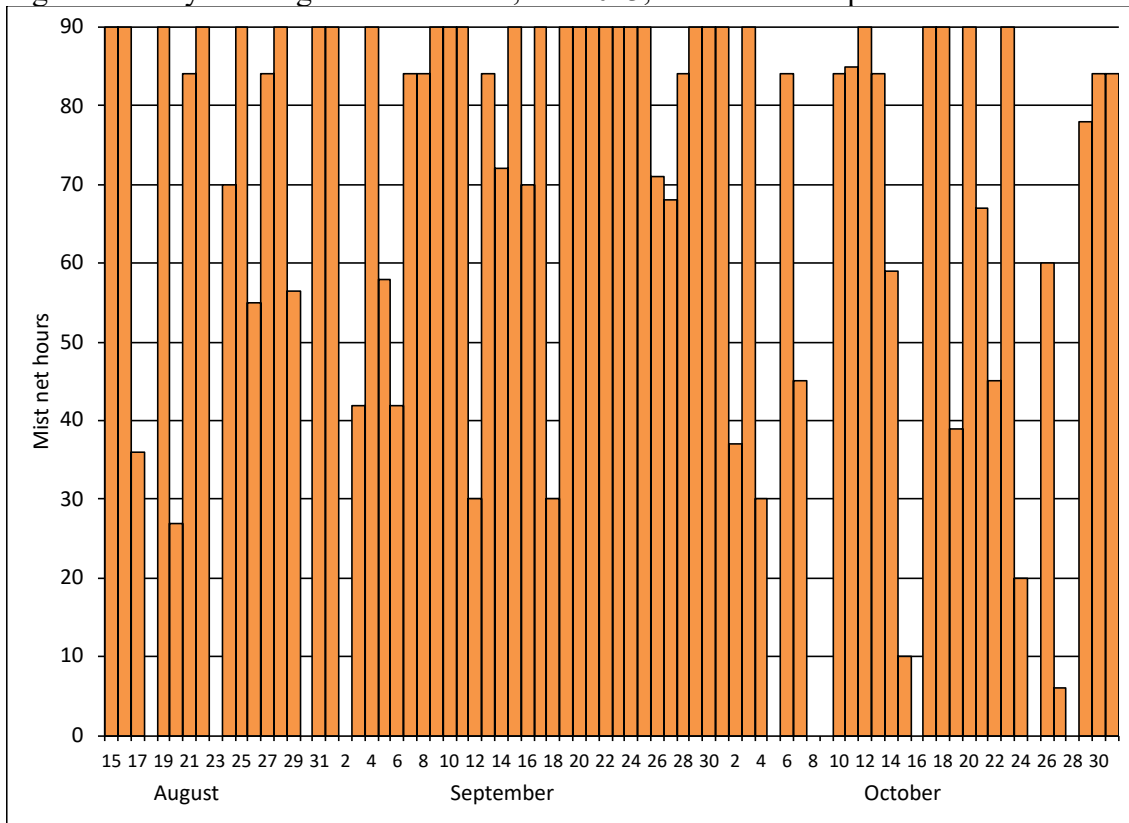


Figure 5: Daily numbers of mist net hours realized at CHRS, fall 2023.

Passerines and Near-Passerines

Long-distance migrants

Long-distance migrants include a wide variety of birds, from hummingbirds to flycatchers to vireos to warblers. The main characteristic involves the long distances flown between their breeding and wintering grounds, which are usually separated by thousands of kilometers. At Cabot Head, this diverse group is already on the move in mid-August when fall monitoring begins, with migration usually peaking in early- to mid-September. Stragglers are always a possibility later in the season.

Tyrant Flycatchers are early migrants (with the exception of Eastern Phoebe); among the first species to depart south in the fall, as early as August, they are never detected in large numbers at Cabot Head. Least Flycatcher was the most detected Tyrant Flycatcher this fall, with 15 birds (including four banded) in 11 days from August 16 to September 13. A total of eight Traill's Flycatchers (combined Alder and Willow Flycatchers, which can only be distinguished by voice) were detected, with four through banding, from September 2 to 8. This species is never numerous; banding totals are usually single-digit numbers, reaching a high of 16 in fall 2007. Detections of Yellow-bellied Flycatcher (on seven days from August 26 to September 9) occurred mostly through banding, with a record total of eight birds banded (same as in fall 2022) compared to only one bird observed. This species is never banded in large numbers; the previous record was seven birds in fall 2014, with none in three fall seasons. On August 29, one Eastern Wood-Pewee was banded, the only bird caught this season. One bird was detected through its characteristic song a few days later (August 31) and a late one observed on October 7, the third detection in October across the years (one bird each on October 4, 2021 and 12, 2004). This species is quite rare in the fall at Cabot Head, as reflected notably in captures in only five previous fall seasons. Great Crested Flycatchers were detected on three days between August 22 and 28, possibly the same bird. One Eastern Kingbird was seen on September 10 this fall. This species is usually present at Cabot Head around the marshy margins of the shallow lakes at the base of West and Middle Bluffs but is not frequently seen in the monitoring area. Very few Eastern Phoebes were detected this fall: one bird on September 5 and one bird on October 7.

Ruby-throated Hummingbirds were seen every day from August 15 to September 17 (except on August 18), with a daily maximum of seven birds.

Red-eyed Vireo is a local, and vocal, abundant breeder on the Bruce Peninsula, making it difficult to determine a clear pattern of migration. Nonetheless, most of them move through Cabot Head in late August and early September. This fall, numbers of Red-eyed Vireos observed and banded were at record highs from August 15 to September 23 (Fig.6), with five more detections of one bird each day on September 24, 25, 27 & 30 and October 1. Daily observations reached peak numbers in late August and early September, notably on September 4 with 87 Red-eyed Vireos (including a record 31 birds banded) and August 24 and 25 with 71 and 74 Vireos, respectively (including 31 and 27 birds banded). Consequently, the 302 Red-eyed Vireos banded this fall constitutes the highest total ever. There is a tremendous range in numbers banded in the fall, from a low of 24 birds in 2009 and a previous high of 239 birds in 2005 (See “Banding Data Analysis”). Conforming with the typical fall banding pattern for Red-eyed Vireos at Cabot Head, most birds banded this year were young born this summer (97% of total).

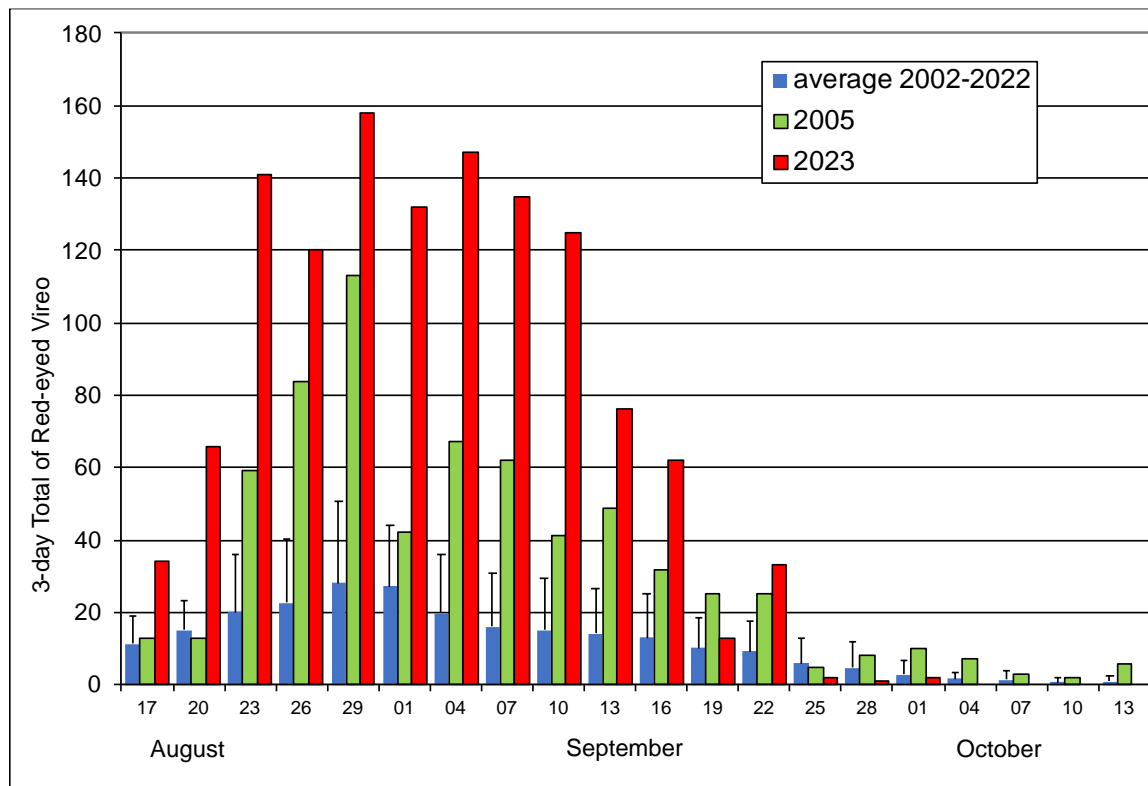


Figure 6: 3-day totals of Red-eyed Vireos detected at CHRS in the fall seasons, in 2005, 2023, and on average for the years 2002-2022.

In fall 2023, there was no observation of Warbling Vireo, as was the case in 11 of the previous 21 fall seasons. On the other hand, Philadelphia Vireo were seen on 14 days, spread out from August 17 to September 9. In the previous 21 fall seasons, this species was missed in three seasons and detected on less than 10 days per season in the other seasons, except in 2014 and 2022 when detections occurred on 13 and 17 days, respectively. A total of six Philadelphia Vireos were banded in fall 2023, similar to previous totals (range of 1 to 6 birds, except 11 in 2022 and none in four fall seasons). Both of these species of Vireos are always more uncommon at Cabot Head than Red-eyed Vireos.

Of the four species of Catharus thrushes seen at Cabot Head, three - Veery, Swainson's and Gray-cheeked Thrushes - are long-distance migrants with wintering ranges mostly in South America. All Thrushes are very secretive, most often detected through banding or singing. Three Veeries were banded, on August 29 and September 9 and 10, one of which recaptured on September 12. This species is never banded in large numbers in the fall, ranging from one (in 2010, 2019, & 2020) to 10 (in 2015) and three seasons without captures. The number of Swainson's Thrushes banded this fall, 76 birds, is only three birds lower than the record high in fall 2015. Swainson's Thrush is a species showing large yearly variations in banding totals (Fig 7). Captures this fall occurred regularly from August 21 to October 10, although about 50% happened on the first 10 days of September (a high of seven birds on September 6), and nine birds banded in October. This species seems to have become more common in October but with no clear trend of increase over the years after 2012 (Fig.8). A total of 17 Gray-cheeked Thrushes were banded this fall from September 3 to 27, a species always less numerous than Swainson's Thrush but showing important yearly variations as well (Fig.7).

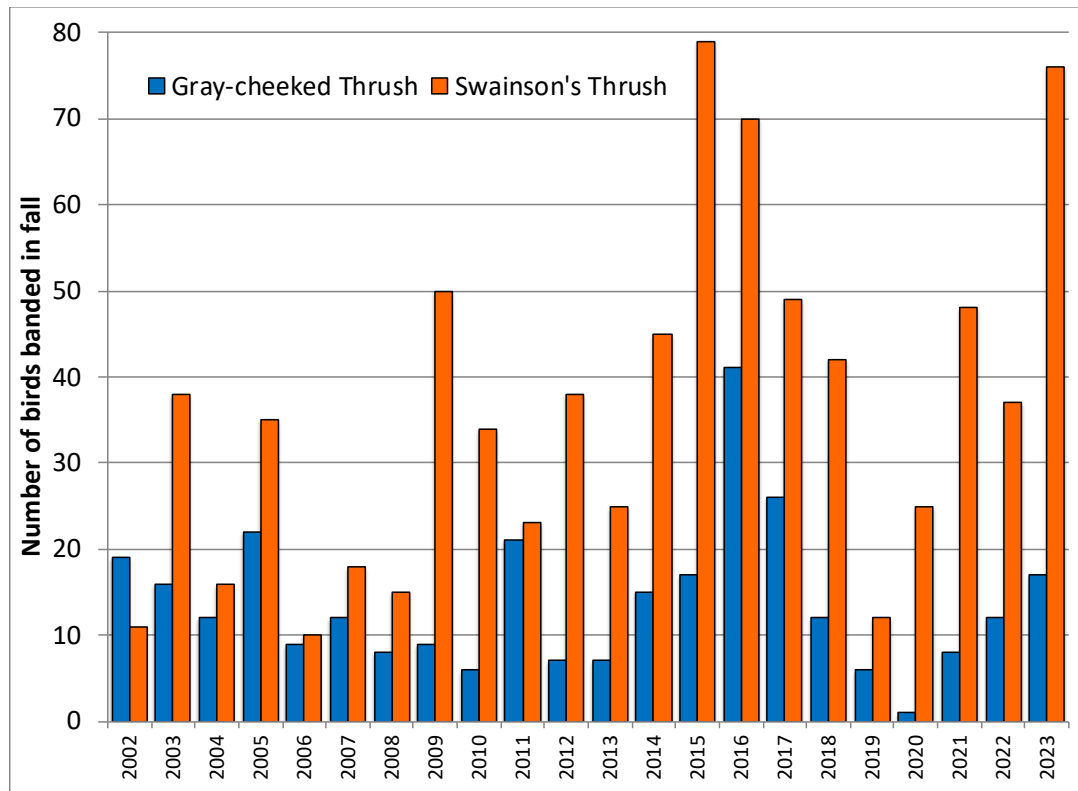


Figure 7. Banding totals of Gray-cheeked and Swainson's Thrushes at CHRS -fall 2002 - 2023.

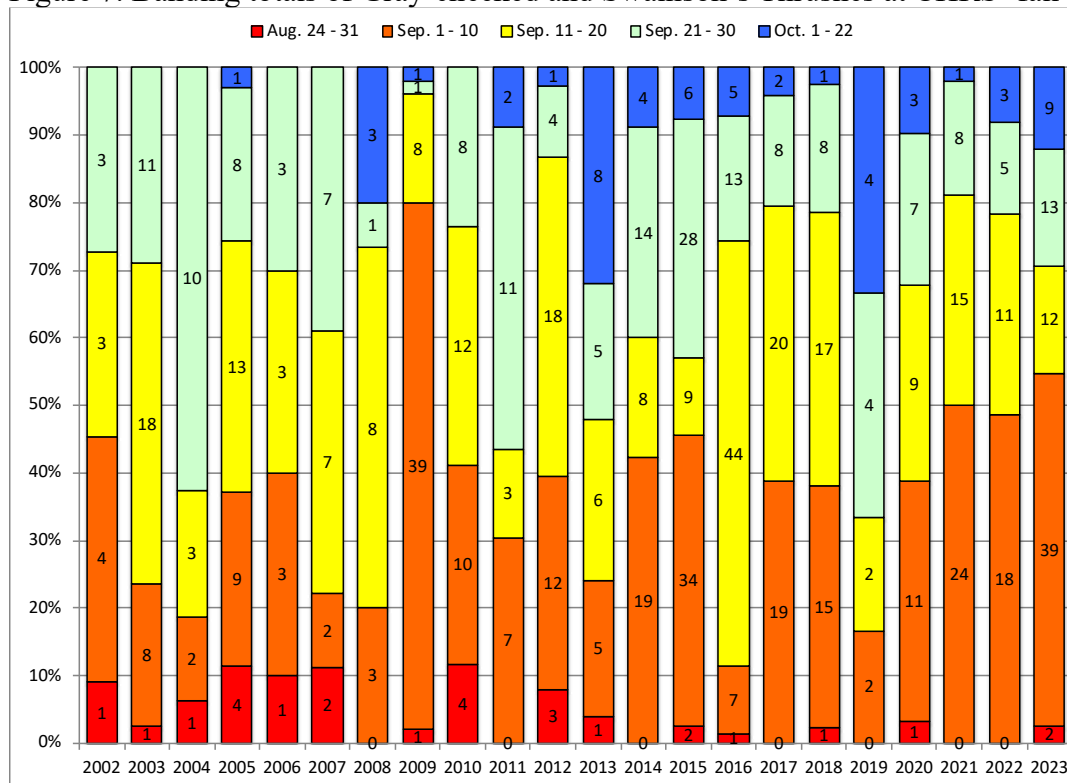


Figure 8. Proportions of banding totals of Swainson's Thrushes at CHRS in fall 2002 - 2023 by 10-day periods. Banding totals by period are indicated in the bars. The last period is 22 days long with only 4 birds in the last 12 days (one each in 2008, 2016, 2019, and 2020).

Diversity and abundance of warblers were at their highest in August and into early September this fall, showing a steady decline afterwards (Fig.9). There were 23 species of warblers detected in fall 2023, with the highest daily diversity reached on September 1 with 15 species of warblers; the highest five-day diversity occurred between August 31 and September 4, when a total of 21 species of warblers were detected: Yellow-rumped Warbler and American Redstart were the most abundant, with high numbers also for Black-throated Green, Common Yellowthroat, and, quite surprisingly, Blackpoll Warbler. Abundance remained high until early September but dropped sharply after September 5. Subsequently, the strong migration of Yellow-rumped Warblers brought the overall number of birds up, mostly at the end of September, while diversity slowly declined as expected. A cumulative total of 20 species of warblers were already observed by August 31, with only three species not yet detected: Palm Warbler was detected first on September 1, Mourning Warbler on September 4 and the first Orange-crowned Warblers on September 19. The latter species is usually among the last species of warbler to be detected but also the one with regular passage in October; the last Orange-crowned Warbler was detected on October 21 this fall. No Pine Warbler was seen or banded this fall, the first fall season without detection. This species breeds at Cabot Head, notably in the Jack Pines around the alvar, and has been observed in every previous fall season, from August 17 to October 30 across the years, albeit in small numbers. Days with observations range from one (in 2019) to nine (in 2006) and between 10 and 13 days in four fall seasons (2004, 2004, 2008, and 2014). It is thus somewhat surprising to not have detected Pine Warbler this fall.

Throughout the season, Myrtle Warbler, American Redstart, Black-throated Green Warbler, Common Yellowthroat, and, to a lesser extent, Black-and-white Warbler and Nashville Warbler, were the species most often detected and in the highest numbers (in decreasing order). After last year's record numbers (93 banded birds), Bay-breasted Warblers were seen and banded in more average numbers this fall, with birds detected on nine days from August 19 to September 23 and a total of 10 birds banded. The first individual(s) of Cape May and Tennessee Warblers were detected on August 15 and 16, respectively, whereas the first Blackpoll Warbler was detected on August 26. The first detections of these spruce budworm specialists, including Bay-breasted Warbler, were among the earliest over the 22 years of monitoring. However, their banding totals were far from the record-breaking numbers of last fall, with some species at or below average. The

exception is Cape May Warbler, with a record 15 birds banded this fall, slightly above the previous record of 12 birds in 2017 and 2022. Caution is required in interpreting such small absolute numbers (e.g., the total of eight Blackburnian Warblers banded this fall is well above the average of 3.7 ± 2.7) but it appears that these budworm specialists may have reached a peak population in the few years past and are slowly declining again following a decrease in spruce budworm infestations.

American Redstart, alongside Myrtle Warbler, is the species of warbler most commonly captured and banded in the fall, albeit with large variations across the years (Fig.10) and despite the fact that the earliest part of its migration is not covered (see Menu 2022). The banding total in fall 2023 was below average and the eighth lowest of the 22 seasons of monitoring.

Yellow Warblers were detected on four occasions, one bird early on August 16 and the other observations grouped in early September. A few other species of warblers were also detected only a few times: one Mourning Warbler on September 4 (through banding); two Northern Waterthrushes on August 16 and 22 (through banding as well); and Wilson's Warbler, detected on three days from August 23 to September 1.

In contrast, several other warbler species were detected quite frequently and notably banded in high numbers. There were eight species with their second-highest or record banding totals this fall (see "Banding Data Analysis"). For example, 15 Canada Warblers were detected on a record number of 12 days (range of one to eight days in the previous 21 years) from August 15 to September 21, with seven of them banded (record high tied with 2002, 2010, and 2022).

An average of nine (± 3) species of warblers have been detected every October between 2002 and 2022, ranging from a low of five species (in 2005, 2007, and 2011) to a high of 15 in 2014, for an overall total of 21 species of warblers. This fall, 11 species of warblers were detected in October; the highest diversity was on October 6 and 10 with seven species each. Orange-crowned, Nashville, Myrtle, and Palm Warblers were the species most commonly detected (both in frequency and abundance), with Myrtle Warbler by far the most abundant. Observations ended sharply after October 14, with late detections involving one Orange-crowned Warbler on October 21 and two and one Myrtle Warblers on October 24 and 25, respectively. A Cape May Warbler on October 6 was the third observation in October for this species. Other species detected were (in increasing order of frequency for observations in October): Northern Parula; Magnolia Warbler; American Redstart; Common Yellowthroat; Black-throated Blue Warbler; Tennessee Warbler.

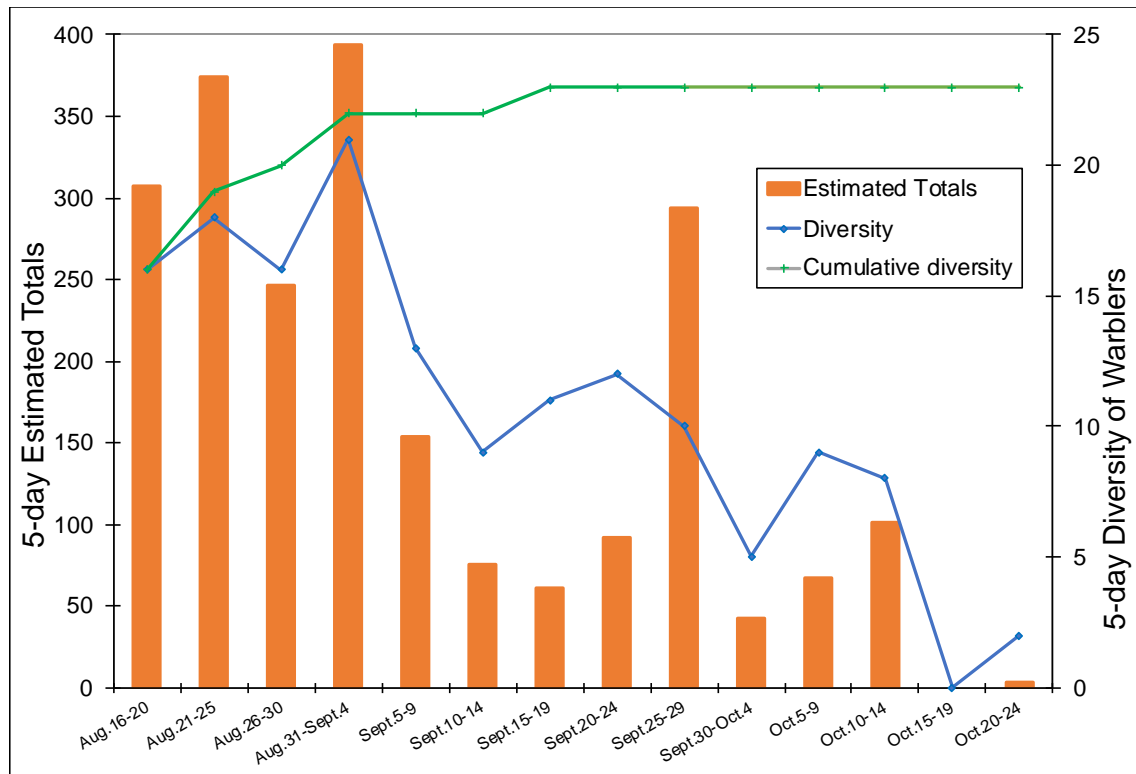


Figure 9. 5-day total numbers of warbler species (right Y-axis) and 5-day estimated totals of warblers (all species combined; left Y-axis) at CHRS in fall 2023.

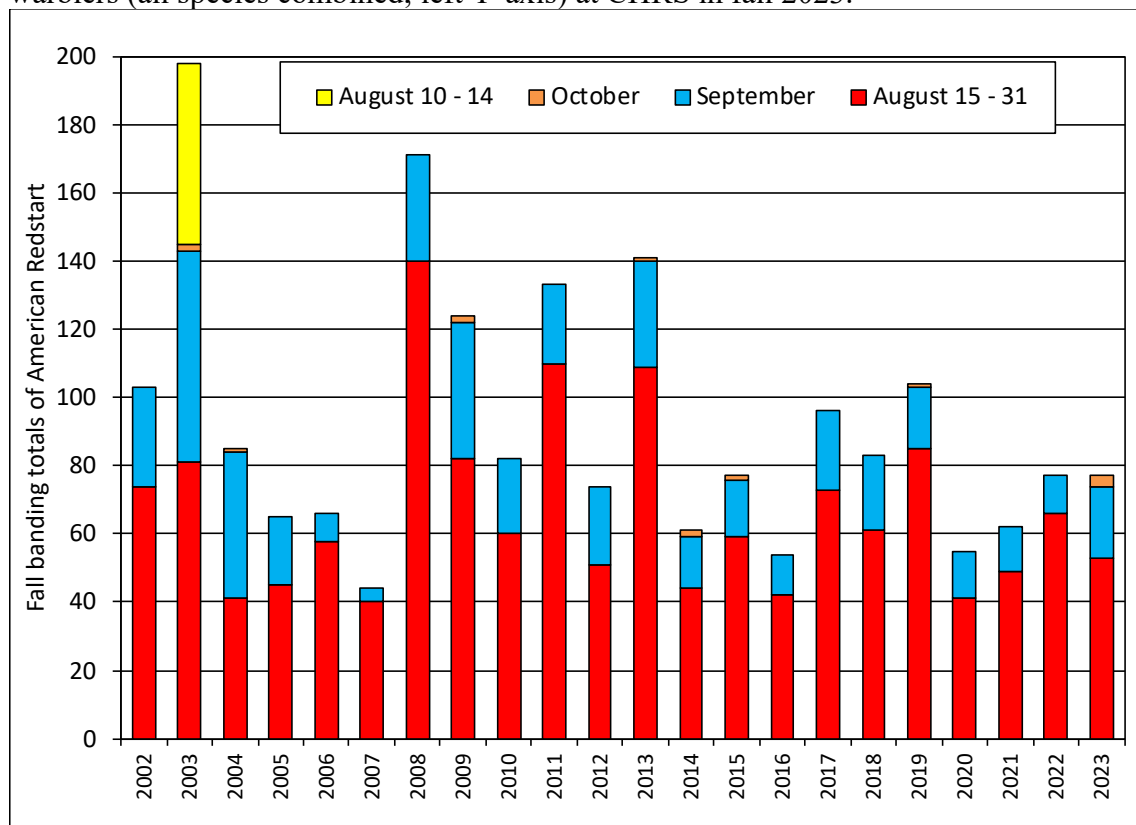


Figure 10. Banding total of American Redstart by month at CHRS in fall 2002 - 2023.

Short-distance migrants

Among passerines, the short-distance migrants are the latest birds in the fall to arrive and pass through Cabot Head, with some species infrequently detected in late fall before the end of monitoring. For example, Northern Shrikes were seen on October 23 and 25 (one bird each) this year but was missed in seven of the previous 21 fall seasons.

Movements of Brown Creepers at Cabot Head start in mid-September, with a few local birds potentially seen and captured as early as mid-August. This year, the first detection was on August 15, with seven more detections from August 20 to September 16. From September 20 to October 21, Brown Creepers were detected almost daily, largely through banding (47% of all detections), resulting in 51 birds banded (average of 43 ± 19 birds; range: 19 in 2009 to 83 in 2021).

With a migration pattern similar to that of Brown Creeper, Golden-crowned Kinglets are, however, much more abundant and vocal. They are always the most numerous species banded in fall (except in three seasons when Black-capped Chickadees had higher banding totals). In fall 2023, Golden-crowned Kinglet was again the most banded species, although with a banding total of 314 birds, below the 2002 - 2022 average of 354 ± 189 birds. This species shows extreme variations in banded numbers: from a low of 113 birds in 2005 to a high of 758 and 754 birds in 2013 and 2022. In fall 2023, the first Golden-crowned Kinglets were detected early in the season on September 5 (first detections range from September 10 and 24, in 2008 and 2009, respectively; with outliers of August 31 in 2003, and September 5 in 2020). The next detections were on September 9 and 15, with detections almost every day afterward, steadily increasing to a well-marked peak in early October, and rapidly declining after October 11 (Fig.11). This is reflected in captures: 48 and 41 Golden-crowned Kinglets were banded on October 3 and 6, respectively, the highest one-day totals for the season. The movement of Golden-crowned Kinglets this fall was concentrated between September 27 and October 11, with 66% of all detections and 70% of banding counts recorded during that period (Fig.11). Migration patterns for this species are very variable in the fall, with passage peaks potentially very different in timing and intensity across years (Fig.11). The fall of 2023 represents an instance of early movement, with 57% of detections attained by October 6, the highest level across the years for that date (over 50% reached in 2008, 2012, 2016 and 2017). Proportions at that date have been as low as 5 and 14% in 2019 and 2009, respectively.

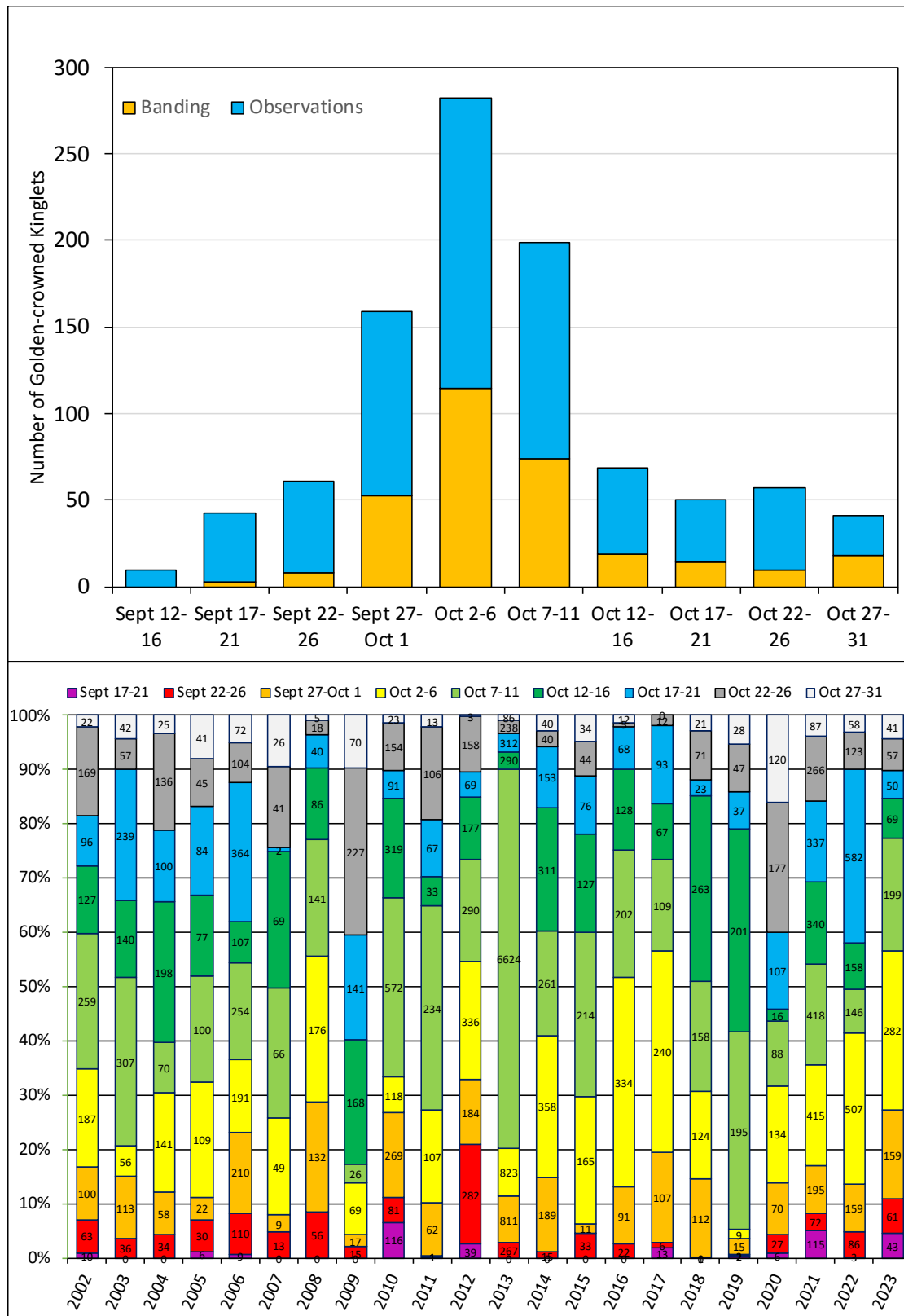


Figure 11. Banding and observation totals of Golden-crowned Kinglets in fall 2023 (top) and observations in % at CHRS in fall 2002 - 2023 (bottom) by 5-day periods. Detection totals by period are indicated in the bars.

Fall migration of Ruby-crowned Kinglet is quite similar to that of Golden-crowned Kinglet, although with possible temporal and numerical differences. Numbers of Ruby-crowned Kinglets are usually lower than Golden-crowned Kinglets, as is the case again this fall. A total of 258 Ruby-crowned Kinglets (including 87 birds banded, the sixth-highest total across the years) were detected from September 7 to October 31. Movements through Cabot Head of Ruby-crowned Kinglets were slightly later than Golden-crowned Kinglets, but differences were small. By October 6, 45% of the season total of Ruby-crowned Kinglet was detected, compared to 57% of Golden-crowns. A week later, the proportions were very similar, at 75% and 78%, respectively.

Red-breasted Nuthatches at Cabot Head are a mix of local and migrant birds, a situation that obscures movement patterns. Furthermore, it is an irruptive species (i.e., at times moving out of its typical range due to fluctuating food sources), although seemingly less nomadic than other irruptive species. As a consequence, it is recorded in either low or high numbers in a somewhat cyclical fashion south of its core breeding range in the boreal forest (Dunn, 2019). Based on banding data, movements at Cabot Head do not seem to follow a clear cycle: after a record high of 166 Nuthatches banded in fall 2022 (and high numbers in six of seven fall seasons prior to 2022), only 13 birds were banded in fall 2023 (Fig.12). Despite the small numbers of Red-breasted Nuthatches banded, this species was observed very frequently from August 15 to October 23, in 52 of 78 days of monitoring (67%), with daily highs of 16 birds on September 1 and 12 the following day. This likely reflects the presence of a local breeding population and the relative ease of detection of this species (through its loud call).

Black-capped Chickadee is another potentially irruptive species, albeit in a more irregular pattern than Red-breasted Nuthatch. The presence of mostly sedentary local birds makes it challenging to precisely determine movements through Cabot Head. The frequency of recaptures of some banded birds certainly indicates a strong fidelity in this species. Based on banding data, it seems that irruption occurred only in fall 2005 and that 2003 and 2007 were very successful breeding years (see Menu 2022). The other fall seasons seem to alternate between very few Chickadees banded, likely local birds, and totals of around a hundred birds, possibly reflecting dispersal of young birds through the Bruce Peninsula in years of high breeding success (Fig.12). The banding total of 32 chickadees in fall 2023 is among the low years, even though this species was present throughout the whole season with observations on 76 of the 78 days of monitoring. In fall 2023, 10 of the 13 banded Black-capped Chickadees were recaptured once or twice during the

season, except one bird, banded on August 16, recaptured four times from September 6 and 26. The very high proportion of recaptures certainly indicates the local nature of the Chickadees encountered during the fall of 2023.

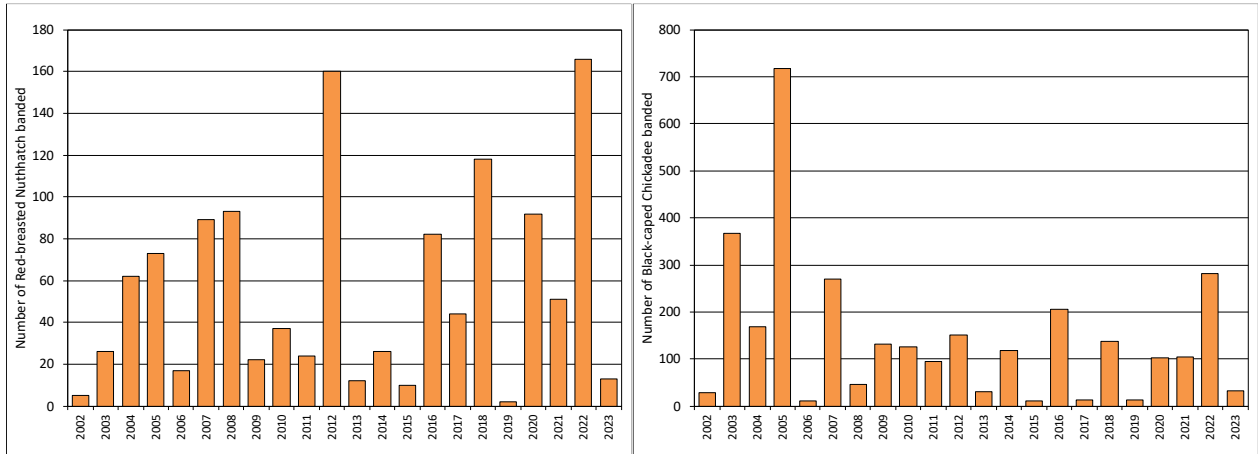


Figure 11. Banding totals of Red-breasted Nuthatches (left) and Black-capped Chickadees (right) in fall 2002 - 2023 at CHRS.

Blue-headed Vireos were detected on 11 days from September 1 to October 17, with only four individuals banded.

At Cabot Head, Blackbirds (Common Grackles, Red-winged and Rusty Blackbirds) are observed in very small numbers in fall, as opposed to spring when large flocks are counted. Rusty Blackbirds have been detected in every fall season, sometimes with only one bird, most often in single-digit numbers, and with significant numbers only in six fall seasons (reaching a high of 91 birds in 2016). In fall 2023, Rusty Blackbirds were observed on five occasions (with a bird each), during the span of September 20 to October 29. Only one Red-winged Blackbird was seen on September 1, while no Common Grackles were detected this fall. Observations during the summer of 2020 seem to indicate an early movement of Common Grackles in mid- to late July at Cabot Head.

American Robins are commonly detected birds at Cabot Head, both as local and migrant birds, albeit not always in large numbers. This fall, there were numerous days with observations of a few American Robins (from one to 19 birds) spread throughout the whole season, with 69% of the season total counted in September and 21% in October. Over the years, daily highs have ranged

from less than 10 American Robins (in 2007, 2017, & 2018) to more than 100 birds (100 in 2002, 114 in 2013, and 217 in 2006).

The overwhelming majority of Blue Jays and Yellow-shafted Flickers usually migrates at Cabot Head in September, albeit with quite different phenology (Fig.13). In fall 2023, Yellow-shafted Flickers were detected in record numbers, with 451 birds (2002-2022 average of 150 ± 100 ; low of 72 in 2007 and high of 394 in 2014). There were many more flickers than average observed throughout the season, notably in mid-September. Likewise, 10 Flickers were banded this fall, the highest total ever. The highest one-day total of the season was on September 23 with 48 Flickers. Blue Jays' movement this fall was average in number, with 821 birds, compared to an average of 1017 ± 525 (low of 362 in 2022 and high of 2825 in 2014). There were more jays observed in the first half of September than average, but numbers declined sharply after September 23.

Myrtle and Pine Warblers, and to a lesser extent, Orange-crowned and Palm Warblers, can be considered short-distance migrants, with a large part of their wintering grounds in the southern USA. Pine Warblers were not detected at all in fall 2023. In contrast, Myrtle Warblers were seen regularly, with detections on most days (73% of the 78 days of monitoring), from August 15 to October 25. The main passage of Myrtle Warblers was from mid-September to early October, with 36% of the season total counted in five days from September 25 to 29, including the highest daily count of 78 birds on September 27. This species, like Pine Warbler, breeds on the Bruce Peninsula: most detections in August and early September were likely of local birds. In contrast, Orange-crowned and Palm Warblers are boreal breeders and do not breed on the Peninsula. The first Palm Warbler was detected on September 1, followed by 16 other days with detections up to October 12 and a season high of 13 birds on October 10. Orange-crowned Warbler is a late migrant: the first bird was detected on September 19, with relatively regular observations afterward until the final bird detected on October 21.

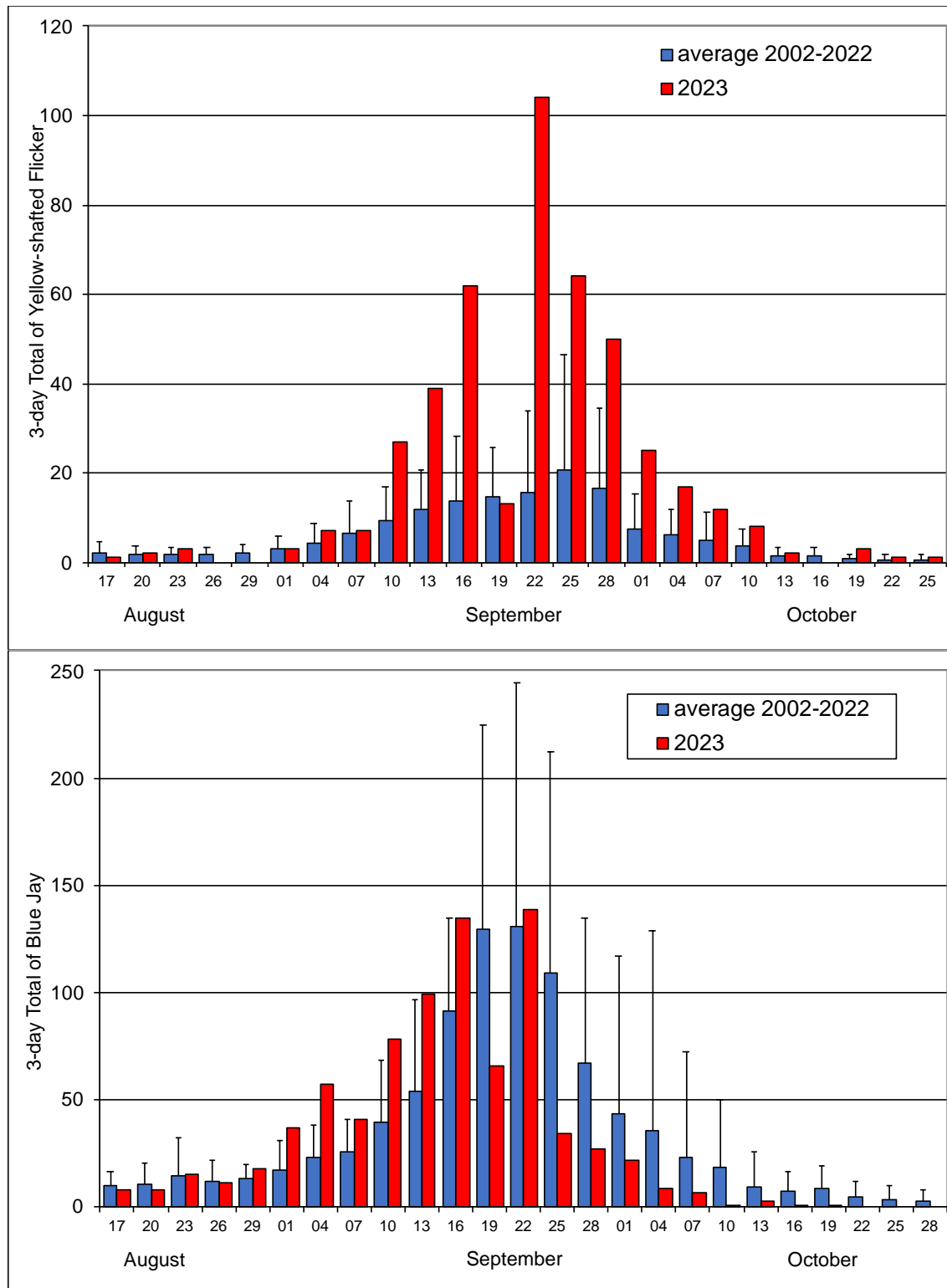


Figure 13. 3-day totals of Yellow-shafted Flickers (top) and Blue Jays (bottom) for 2023 and the combined years of 2002 to 2022 at CHRS.

The 11 sparrow species observed at Cabot Head are short-distance migrants, with wintering ranges confined mostly to southern Canada and the eastern USA. At Cabot Head, Song Sparrow is a local breeder, a fact that tends to obscure migration patterns for that species. It was observed this fall in small numbers (from one to 14 birds per day) frequently from August 19 to October 29 (on 74% of monitoring days). It was also banded in high numbers this fall, with 21 birds (average of 13 ± 5 birds). A total of six Savannah Sparrows was detected this fall from September 9 to October 9, including three birds banded. This species is never captured in high numbers in the fall (one to eight birds, with 11 in 2020) with no captures in eight seasons.

Fox Sparrow is a rather secretive species, foraging on the ground for food usually under thick cover. It is mostly silent during migration, especially in the fall, making its detection even more difficult. As a consequence, it is observed in very small numbers at Cabot Head during the fall, with one to eight detections (mostly through banding) per season from September 28 (in 2012) to October 31 (missed only in fall 2017). This fall, a record seven Fox Sparrows were banded from October 3 to 30, with three birds on that later date, and one bird seen on October 28.

The most abundant sparrows monitored in the fall are White-crowned and White-throated Sparrows and Dark-eyed Juncos, the latter two species also breeding in very low densities on the Bruce Peninsula. Very few birds, if any, of these two species are detected in August and early September at Cabot Head. This fall, two young Dark-eyed Juncos (in very juvenile plumage) were captured on the first day of banding, August 15, likely hatched locally. Five more young birds were banded from August 22 to September 14. From September 15 to the end of monitoring, Dark-eyed Juncos were observed almost every day, in good numbers, notably in October with 10 days during that month having totals of more than 20 birds and a high of 55 birds on October 17. As a consequence, the season total of 726 birds detected is the highest in the 22 years of monitoring (average of 353 ± 166 ; range: 53 in 2019 - 666 in 2014) and the banding total of 174 birds is the second-highest, about double the average of 91 ± 39 (range: 24 in 2019 - 184 in 2021). Dark-eyed Juncos were banded almost daily from September 14 to October 31, with a high of 24 birds on October 17 and 17 birds on the last day of banding, October 31. This fall, there was an early and strong movement of Dark-eyed Juncos, with 23% of the season total counted between September 13 and 26 (Fig.14; numbers before September 13 account for 6% of the season total). However, the bulk of the passage (64%) was in the last three weeks of October. There were still good numbers of Dark-eyed Juncos in the first few days of November (*pers. obs.*). As with other species, the

phenology of Junco migration is very variable across years: in some fall seasons, more than 70% of the seasonal total is already counted by October 11, whereas in other years the proportion is between 10 and 20%. In the last week of monitoring (October 25 - 31), numbers of Juncos detected can range from less than 10% of the seasonal total to 30% or more (with an extreme of 58% in 2019, a year of very low overall numbers). In fall 2023, it was 16%. Migration can thus be “early” with 50 to 70% of the total passage happening before October 11 or “late” with 60 to 80% of counts coming after October 18 (Fig.14). In fall 2023, these numbers were 36 and 42%, respectively, indicating a rather spread-out passage through Cabot Head.

The first White-throated Sparrow was detected on August 31, involving the capture of a young bird likely from the small local breeding population, which was recaptured the following day. From September 4 to October 17, White-throated Sparrows were observed and/or banded almost daily, with the last detections of one bird each on October 30 and 31. The highest daily totals this fall were 23 and 22 birds on September 17 and 18, respectively. A total of 58 White-throated Sparrows were banded this fall, quite below the average of 73 ± 41 (range: 27 in 2019 - 199 in 2005; see the section “Comparison between falls of 2005 and 2023”).

The migration of White-crowned Sparrows generally happens slightly later than that of White-throated Sparrows. This fall, the first detection of White-crowned Sparrows was on September 11 with high numbers arriving shortly afterward and observations thereafter occurring daily up to October 30 (only four days with no observations during that 50-day period). Highest daily totals occurred on October 10 and 11, with 66 and 64 birds counted, respectively. Numbers dropped sharply a few days later (Fig.15). The season banding total of 84 White-crowned Sparrows is the second highest in 22 fall seasons and well above the average of 45 ± 27 . As with White-throated Sparrows, banding totals fluctuate wildly over the years (from a low of 17 in 2019 to a high of 126 in 2007; Fig.15).

In fall 2023, there was an obvious arrival of these three species of sparrows on September 15 and 16 (see Fig.14&15) when numbers went from a few birds to double-digit totals for the three species. On September 14 and 15, strong winds blew, first from the north, then the west, likely providing good migrating conditions. Then the wind shifted, but stayed strong, coming from the south, potentially blocking migration, as birds tend to avoid flying against a headwind. It is possible that these conditions were conducive to a stopover of Juncos and Sparrows at Cabot Head, resulting in higher numbers than usual at this time of year.

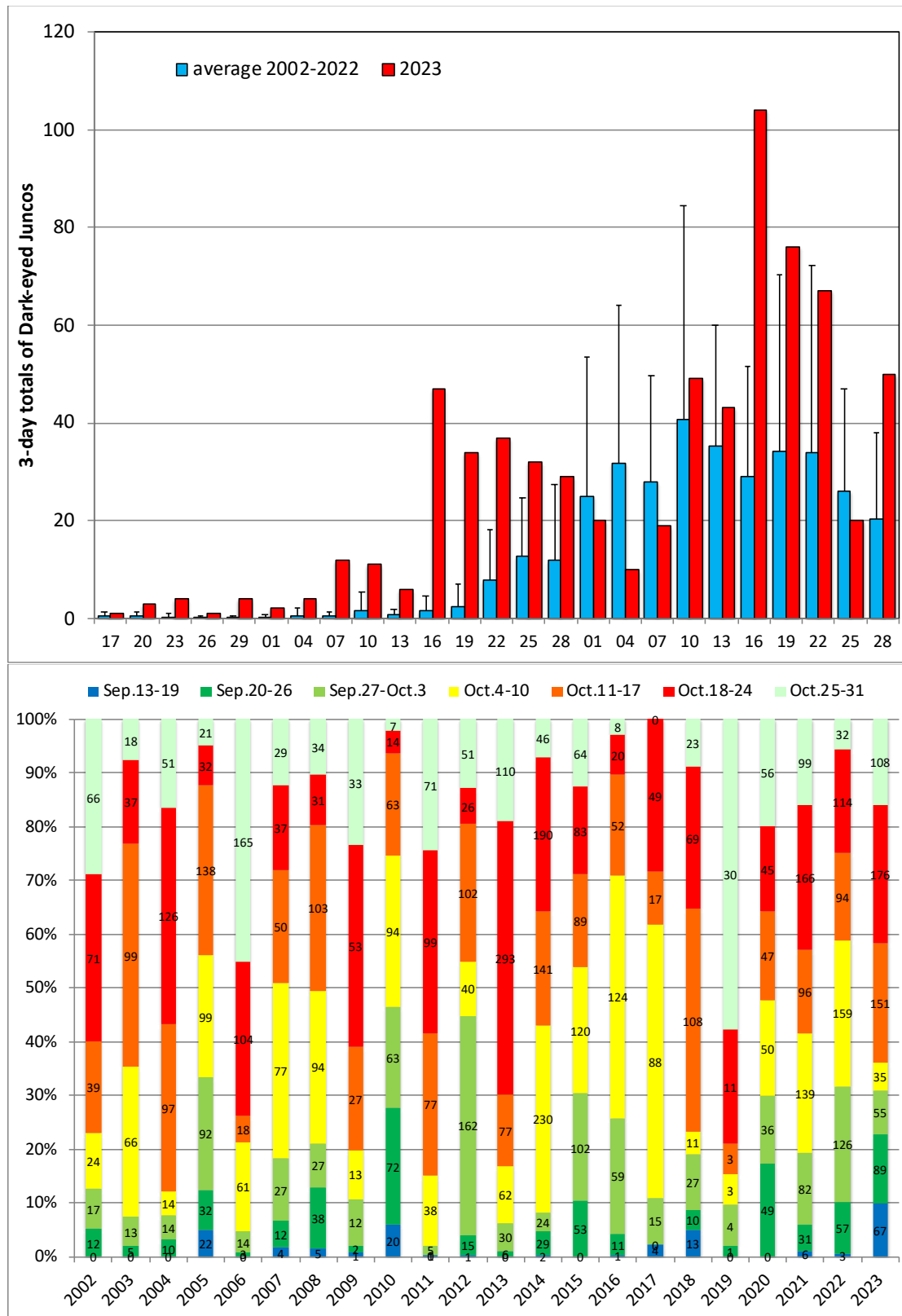


Figure 14. 7-day totals of Dark-eyed Juncos in 2023 and average 2002 - 2022 (top) and proportions of detected totals in fall 2002 - 2023 by 7-day periods (bottom) at CHRS. Detected totals by period are indicated in the bars.

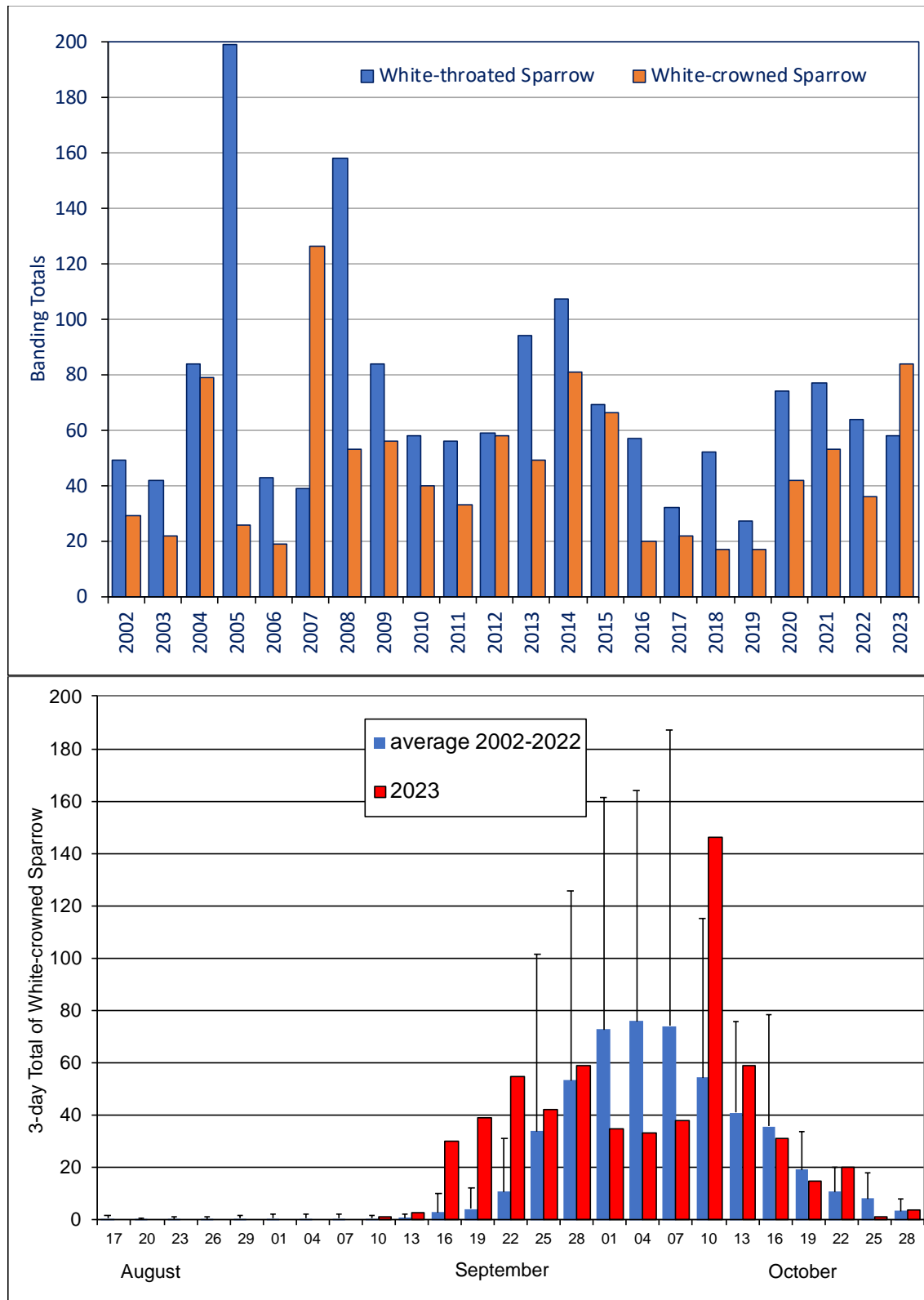


Figure 15. Banding totals of White-throated and White-crowned Sparrows (top) and 3-day totals of White-crowned Sparrows in 2023 and average 2002 - 2022 (bottom) at CHRS.

Lincoln's and Swamp Sparrows are always detected in small numbers in the fall, very often through banding, as they are quite secretive. This fall, a record total of 28 Lincoln's Sparrows (range from one in 2009 to 24 in 2021) were detected sporadically from September 4 to October 13, with six detections through banding, for nine birds banded (around average). The migration of Swamp Sparrows was similar, with 21 birds (range from one in 2015 to 28 in 2003) detected during the exact same period as Lincoln's Sparrow, including 10 banded in eight days.

American Tree Sparrow is a late migrant, with movements through Cabot Head starting in mid-October and likely continuing into November after the end of the migration monitoring period. In fall 2023, the first detection - of two birds - was on October 9, among the earliest dates over the years (earliest date in the past six years was September 13). In 2023, American Tree Sparrows were detected daily from the date of first detection to the end of the monitoring period, with one to 55 birds observed per day. A record total of 103 American Tree Sparrows were banded, about half of them during the last three days (51 birds, more than the entire totals of 18 past seasons). Indeed, this species shows extreme variations in banded numbers, from a low of four birds in 2018 to a high of 94 birds in 2015. Daily banding totals are usually single-digit, as was the case in 2023, except on four days, with a high of 22 birds on October 29. Occasionally, impressive numbers can be banded in one day: 38 birds on October 26, 2004, 41 on October 28, 2010, and 37 on October 26, 2015.

This fall, five species of Finches were detected, with very large numerical differences between them, from one Pine Grosbeak seen on October 29 to several hundred Pine Siskins observed from mid-September to the end of monitoring. No Common Redpoll or Red Crossbill were noted this fall. Except for American Goldfinch and Purple Finch, finches spend most of their time in the boreal forest, depending on seed and cone crops of various specific trees and shrubs for food. When these resources fail, as they tend to in some years, it provokes a southward movement of finches, an irruption of variable amplitude. Predicting irruptions is as much science as art and is greatly awaited every year (see the Finch Network www.finchnetwork.org). This fall, a strong southerly movement was predicted only for Pine Siskin, which was certainly confirmed at Cabot Head, when large flocks were seen throughout the second half of fall. The first detection was 12 birds on September 5, with one to 20 birds seen regularly for two weeks afterward. Numbers surged rapidly on September 19 (55 Pine Siskins counted) and afterwards (125 birds on September 23). From then on, numbers fluctuated wildly, reaching highs of several hundred in late October (420

birds on the 22nd). A total of 67 Pine Siskins were banded in only four days with captures, including October 23 when 59 siskins got banded, 51 of them captured all at once in one net!

Unlike the massive movement in fall 2021, White-winged Crossbills were detected only on five days, albeit with totals of 163 and 62 birds on October 22 and 13, respectively. American Goldfinches were detected throughout the entire season: there were 47 days with observations, most of them of just a few birds, except for a high count of 42 birds on October 23. In contrast to American Goldfinch, Purple Finches are never observed in such large numbers, even though it is also a relatively common bird. There were only 10 days with observations of Purple Finch in fall 2023, scattered from August 16 to October 31.

Arctic songbird migrants

A few songbird species breed in the Arctic in the summer and spend the rest of the year in mid-latitude areas (southern Canada and northern USA): they do migrate long distances but without going into tropical areas as do more typical long-distance migrants. At Cabot Head, the most commonly observed of the Arctic songbird migrants are Horned Lark, Snow Bunting, and American Pipit. These three species prefer open habitats and are usually detected at Cabot Head either flying overhead or along the shoreline and the open, shrubby tip.

In fall 2023, Horned Lark was first seen on September 9 with one bird. This species was detected - often by their calls without seeing the birds - during four other days from September 18 to October 17. American Pipits, more often heard than seen, were detected on a record of 42 days from September 8, the third earliest detection date, to October 23 (high of 23 birds on September 18). In previous seasons, the number of days with detections have ranged from three (in 2018) to 38 (in 2002), with a median of 10 days. Snow Buntings were the last ones to arrive at Cabot Head, with the first bird on October 17, the second earliest date ever (October 14 in 2007) and observations of one to 24 birds five days in a row starting on October 23. A Lapland Longspur was heard and then briefly seen flying on September 14. It is the seventh fall season with detection of this uncommon species at Cabot Head: one in 2013 also detected on September 14, while all the other ones were seen in October, from the 2nd to the 29th.

Raptors

In contrast to spring, no substantial migration of soaring raptors occurs over the Bruce Peninsula in the fall: with no thermals forming above it, Georgian Bay presents a formidable barrier to cross. As a consequence, the most commonly seen species are the local breeding residents, notably, Bald Eagle and Merlin. Bald Eagles were seen frequently from August 15 to October 31 (68% of the 78 days of monitoring), often the local breeding pair and their fledged young, but also very regularly other eagles, as indicated by the high of eight birds on August 16.

Merlins breed every year at Cabot Head, exhibiting strong territorial behaviour and aggression against potential nest predators, making this species quite visible. This fall, it was detected on 42 days, or 54% of the time, from August 15 to October 30. Sharp-shinned Hawks were seen on 20 days this fall, with a high of 10 birds on September 23 and two birds banded. Between one and five Sharp-shinned Hawks are typically banded in the fall (and none in five seasons), compared to 10 to 34 in the spring, a clear indication of the strong seasonal difference in their migration pattern.

Other notable observations of raptors include: 10 Broad-winged Hawks on August 23 and, most remarkably, two young banded on September 3 and 5; Northern Goshawk on September 21 and 22, and October 21; 18 days with observations of Peregrine Falcons, from August 20 to October 29 with one or two birds a day, except on September 26 and 27 when three birds were observed; one Red-shouldered Hawk observed on August 16 and 19; one dark morph Rough-legged Hawk observed on October 25 and 27. While Rough-legged Hawks are relatively frequent on the Bruce Peninsula during the winter, they have been detected at Cabot Head in the fall in only five previous seasons from October 12 to 31 with one or two birds at the most; an adult Swainson's Hawk was seen soaring and gliding south on September 13, the second bird of this western species ever seen at Cabot Head (and the Bruce Peninsula); Cooper's Hawks were seen from August 15 to October 20, on a record number of 11 occasions. (range of one to five days in the 14 previous fall seasons with observation); a young bird, notably, was seen perched a few times very close to the station (including on the Motus tower).

On September 3 this year, a young Broad-winged Hawk was captured and banded, the second one ever banded at Cabot Head, after a bird in fall 2021 (Photo1). Incredibly, a second young Broad-winged Hawk was captured two days later this fall, in the same area (net C14 instead of C15).

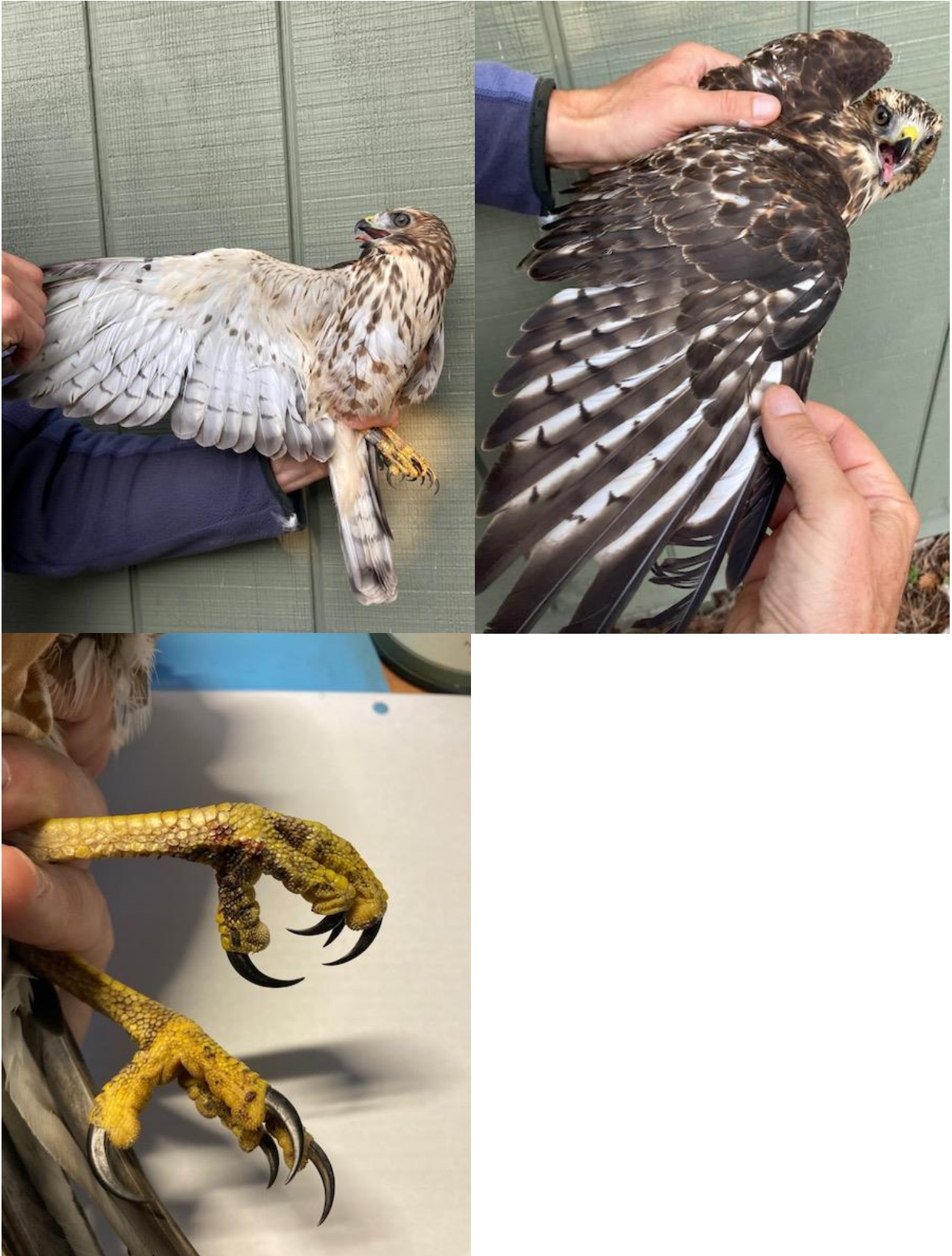


Photo 1: Broad-winged Hawk banded at Cabot Head

Waterfowl

Canada Geese usually migrate in early September but with large variations across the years (Fig.17). Large movements are strongly influenced by weather: north winds tend to bring numerous flocks flying through. This fall, limited movements in September were noted early in the month (429 and 135 birds on the 8th and 9th, respectively) and on September 18 with the season high of 738 birds. A strong north wind and an overcast sky on September 8 and 18 provided ideal conditions for both migration and observation (easier to detect distant flocks of Canada Goose in a cloudy sky). Few Canada Geese were counted in October, except for 43 birds on October 16.

A few Double-crested Cormorants were seen daily from the start of monitoring period until September 26 (except for one day) with a few more observations afterwards until October 24. This species is typically observed roosting or fishing in Wingfield Basin and in Georgian Bay waters near shore. It is, however, rarely seen in active migration. Daily totals were usually in single-digits, with a high of 20 birds on August 16. The season total for fall 2023 was also quite low (Fig.18). Water levels, fish availability (or lack thereof), potential harassment and predation by Bald Eagles, and likely other factors (e.g., observation effort over the bay) influence the numbers of Double-crested Cormorants detected at Cabot Head.

Common Loons were seen throughout the entire season from August 16 to October 30 for a total of 55 days with detection (71% of the fall monitoring period). Most daily totals were single-digits but four days had totals ranging from 11 to 16 in late September. There was no strong movement this fall, as opposed to the 72 Common Loons counted on September 12, 2021. The season total of 208 Common Loons in fall 2023 is relatively similar to totals since fall 2010 (with the exception of 2014 and 2021; Fig.19). This species is a strong flyer and moves through the area rapidly, making detection difficult.

One Surf Scoter was seen flying over Georgian Bay on October 15. Two and five Black Scoters were observed on October 17 and 27 respectively. White-winged Scoters are much more common in general, with observations this fall from October 12 to 29, for a season total of 69 birds and a large one-day total of 20 birds on October 20 (season totals range from nine in 2011 to 310 in 2014, with the highest one-day count of 152 birds on October 19, 2014). Scoters tend to be seen flying low and fast over the water of Georgian Bay and often quite some distance from shore, making them easily missed. Long-tailed Duck is another waterfowl species with extreme fluctuations in numbers detected, from a low of five and six birds (in 2016 and 2017, respectively)

to a high of 268 birds in 2022. Its migration happens mostly after mid-October and, very likely, extends into November. In fall 2023, a second-highest season total of 201 Long-tailed Ducks was counted; detections occurred on eight days from October 18 to 29, with one-day highs of 87 and 94 birds on October 27 and 29, respectively. Another late-migrant species, one Bufflehead was seen on October 28, the only observation of the fall. Likewise, Common Goldeneyes were observed on the last days of monitoring, with a season total of eight birds.

Common Mergansers were observed on 36 days from August 29 to October 31, with a few large flocks fishing in Wingfield Basin (e.g., 33 birds on September 28 and 24 on October 31). Observations of Red-breasted Mergansers were concentrated in the second half of October this fall, with only two detections before October 15. Birds were mostly seen on active migration over the bay, with a daily high of 55 birds on October 27. No Hooded Mergansers were detected this fall, despite this species being present in the nearby shallow lakes and wetlands.

There were very few observations of Horned and Red-necked Grebes this fall: two Horned Grebes on October 2 and one or two Red-necked Grebes on four days from September 15 to October 19.

A few unusual species of waterfowl were noted. A family of four Tundra Swans flew over Wingfield basin on the last day of monitoring. This is only the third time that Tundra Swans have been detected in the fall, with a family of four observed both previous times (October 4, 2014 & October 27, 2022). A mixed flock of ducks was seen over Georgian Bay on October 26, with one Gadwall (the fifth fall season with observation of this species), five American Black Ducks, and eight American Wigeons. Two flocks of Northern Pintails were seen (24 birds on September 22 and seven on October 21). Previously, this species was detected only in 2005 and 2021, with five and three birds, respectively. Two Redheads (a male and a female) were detected on September 15 (the third fall with observation, after 2014 and 2021, with one bird each in mid-October) followed by two Green-winged Teals on September 16.

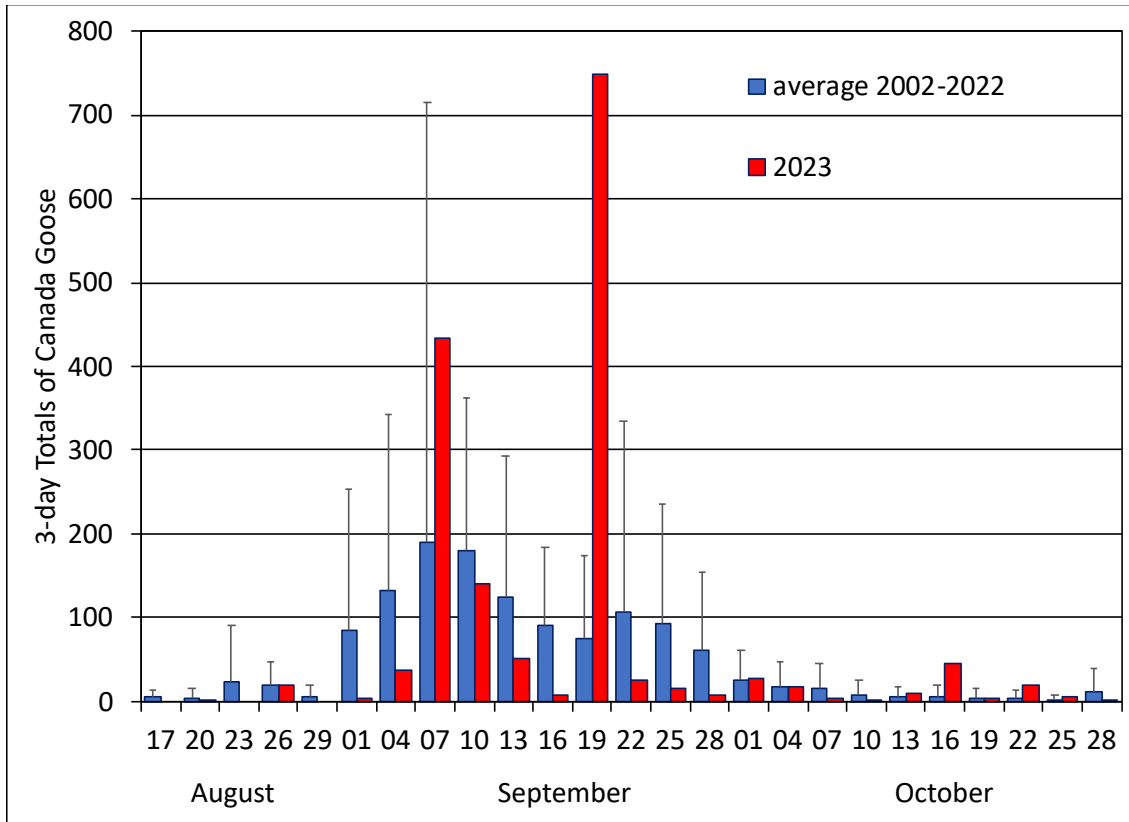


Figure 17. 3-day totals of Canada Goose for falls 2023 and average 2002 to 2022 at CHRS.

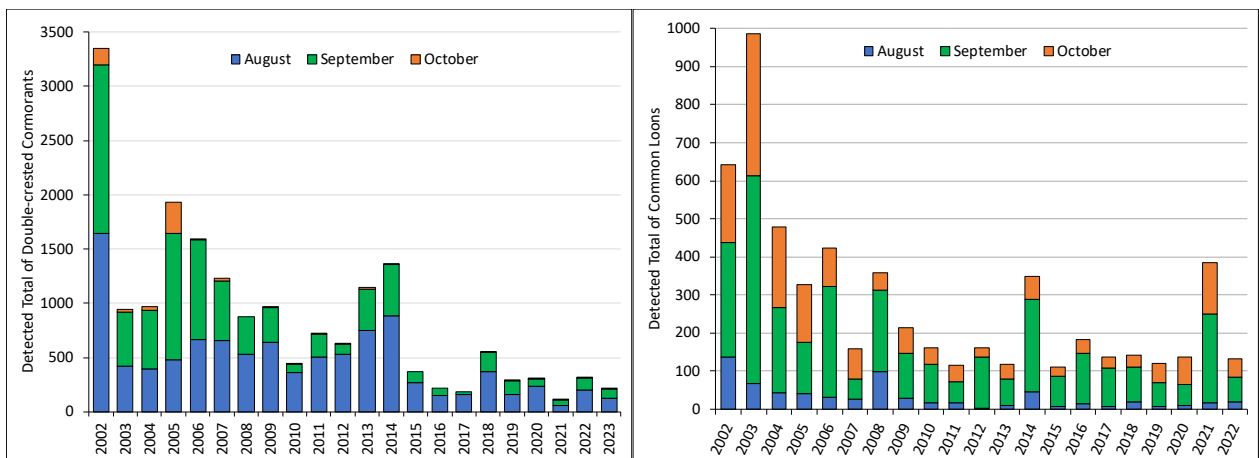


Figure 18. Detected totals of Double-crested Cormorants (left) and Common Loons (right) at CHRS, 2002 - 2023, in relation to year and month of monitoring.

3. Unusual Records

An unusual record at Cabot Head can involve a bird: outside of range (either spatial, temporal, or numerical); whose species constitutes an overall low population on the Northern Bruce Peninsula; whose preferred habitats are not present at Cabot Head; whose species is rare overall, either at a provincial or continental level. Other included species are either not easily detected or in an unusual pattern of detection compared to other seasons. Below in chronological order is the list of the fall 2023 unusual records (unless stated elsewhere in the document).

One Caspian Tern on August 16. A Great Horned Owl seen (or, occasionally, heard) on 16 days from August 16 to September 21, often detected through the alarm calls of American Crows. One Black-billed Cuckoo on August 27. One Great Egret on August 28, the fifth fall season with detection (after 2005, 2008, 2016 and 2021). One Blue-gray Gnatcatcher on August 30. A Solitary Sandpiper on September 14. Sandhill Cranes heard on October 5, the only detection of the season. This species is usually observed throughout the season, notably in August, making these likely local birds. It is possible that the breeding pair(s) around Cabot Head was not successful this year and that they departed the area earlier. A Short-eared Owl on October 12. One Northern Shrike on October 23 and 25. Red-throated Loons on October 27 and 30 with one bird each. Eastern Bluebirds seen on four days from August 19 to October 20, with one bird each day. This species was detected in ten of the previous 21 fall seasons. A Townsend's Solitaire seen briefly on October 22, the sixth record of this western species.

As noted previously, a Swainson's Hawk was observed on September 13 as it flew high over Cabot Head. As with the observation of the Townsend's Solitaire, this rare sighting is a perfect illustration of the amount of luck involved and the necessity of remaining alert. The hawk was first spotted with the naked eye as it was soaring, looking (almost) like the usual and very common Red-tailed Hawk. Only the more tapered wings seemed anomalous, which prompted a closer look. Despite the poor lightning and the fact that the bird was rapidly gaining altitude, it was quickly evident that it was not a more common *Buteo*. Unfortunately, the Swainson's Hawk kept soaring higher, eventually gliding south where it disappeared, never giving a great view despite the observer switching from naked eye to binocular to spotting scope. The bird could have been easily missed or - even worse - dismissed after a casual glance and a shrug as a common Red-tailed Hawk.

4. Banding Data Analysis

Fall 2023 Overview

Fall 2023, with 2121 birds of 70 species banded, is the fourth highest banding total of the 22 fall seasons. With an average of 1713 ± 458 birds, banding totals in the fall have been quite variable over the years, with lows of 1018 and 1037 banded birds (in 2019 and 2017, respectively) and highs over 2000 banded birds in five previous fall seasons, notably, 2475 birds in 2005 and 2925 birds in 2022. In fall 2023, about half of the days with banding produced totals from 11 to 30 birds, while 16 days had totals from 31 to 50 birds. Only 11 days of banding yielded more than 50 birds per day, including the highest total of the season, 103 birds on October 23.

This fall, nine species were banded in record high numbers (two of them tied with the previous record). Most notable was Red-eyed Vireo with 302 birds banded, finally surpassing the 2005 total of 239 birds after 18 years. For another ten species, fall 2023 was the second-highest banding total overall, with numbers sometimes very close to the record high (Table 2 and Fig.19). For example, 174 Dark-eyed Juncos were banded this fall compared to 184 in fall 2021. In contrast, no species was banded at record low levels this fall. However, six species that have usually been banded (in 10 or more of the previous 21 seasons) were not captured at all, notably, Eastern Phoebe and Scarlet Tanager (both banded in 12 fall seasons) and Yellow-billed Cuckoo and Rose-breasted Grosbeak (both banded in 10 fall seasons).

Golden-crowned Kinglet, with 314 birds banded, and Red-eyed Vireo, with 302 birds banded, both represent about 15% of the seasonal total for all birds. Dark-eyed Junco, American Tree Sparrow, and Black-throated Green Warbler, the top five most banded species, account for 47% of the banding total this fall. A total of 11 species had banding totals between 50 and 100 individuals. On the other end of the spectrum, seven species each had only one individual banded and another 41 had banding totals between two and five birds (Table 1).

Numerous variables affect capture rates, including population dynamics, weather conditions during migration, vegetation changes at the site, food availability, etc. Capture rates varied greatly on a weekly basis (Fig.20). The capture rate is determined by dividing the number of birds caught by the number of hours for which the nets were operated. Thus, variations in capture rate reflect fluctuations in those two parameters, which are themselves dependent upon various

changing conditions (weather being the major one). Mist net hours are primarily lost when weather conditions (i.e., rain or strong wind) render it unsafe to capture birds, thus forcing net closure. In fall 2023, weekly capture rates were at record highs (for four weeks) or well above average most of the season, except for three weeks, notably during September 20 – 26, when the rate was well below average. This fall, mist net hours per week were a mix of well below, around, or above average; the highest weekly percentage occurred between September 20 and October 3, while the following week (October 4 - 10) reached the lowest level of mist net hours realized of all fall seasons (Fig.21).

Weekly numbers of banded birds partially reflect variation in daily capture rates (Fig.20). Banded numbers were above average every week, except September 20 - 26 and October 4 – 10 as previously described. Numbers of birds banded were particularly impressive during the first two weeks, notably August 23 – 29, when a record 252 birds were banded, finally breaking the 18-year-old record of 243 birds in fall 2005. Of course, a week is a rather arbitrary temporal division, mostly useful to smooth the extreme daily variations in banding (see Fig.22) and to allow comparisons between years. For example, the above-average banding total for the last week is mostly due to the last three days, for which daily totals were either the highest or second-highest.

In fall 2023, 70% of the potential mist net hours were realized; the range is from 54% in fall 2007 to 85% in fall 2008, with an average of $72\% \pm 9$. Poor weather conditions precluded opening any mist nets for a total of 10 days this fall. Conditions allowed for a complete daily banding operation (all 15 mist nets opened for six hours; i.e., 90 mist-net hours a day) during 38% of the monitoring period (that is, 30 days). Coverage of 80 mist-net hours or more per day was realized during 54% of the monitoring period.

Table 1. Number of species banded in fall 2023 at CHRS according to their banding total.

Banding total	1 - 10	11 – 50	51 – 100	>101
Number of species	44	11	11	4

Table 2. Banding totals at CHRS in fall 2023, with 2002 - 2022 average (and Standard Deviation), maximum and minimum totals for 2002 - 2022, and number of previous falls with captures.

Group	Species	2022	Av.	StDev.	Max.	Min.	#
Hawks, Kites & Eagles	Sharp-shinned Hawk	2	3	1	5	1	16
	Broad-winged Hawk	2	1		1	1	1
Kingfishers	Belted Kingfisher	1	1	1	3	1	13
Woodpeckers	Red-bellied Woodpecker	1	1	1	3	1	6
	Yellow-bellied Sapsucker	4	2	1	3	1	13
	Downy Woodpecker	10	11	8	31	1	21
	Hairy Woodpecker	6	5	3	12	1	18
	Yellow-Shafted Flicker	10	4	2	8	1	20
	Pileated Woodpecker	2	1	1	3	1	12
Tyrant Flycatchers	Eastern Wood-pewee	1	1	1	2	1	5
	Yellow-bellied Flycatcher	8	3	2	8	1	18
	Traill's Flycatcher	4	6	4	16	1	21
	Least Flycatcher	4	5	2	9	3	20
Vireos	Blue-headed Vireo	4	8	6	28	1	21
	Philadelphia Vireo	6	3	3	11	1	17
	Red-eyed Vireo	302	81	49	239	24	21
Crows & Jays	Blue Jay	14	6	4	17	1	20
Chickadees	Black-capped Chickadee	32	149	162	717	11	21
Nuthatches	Red-breasted Nuthatch	13	58	49	166	2	21
Creepers	Brown Creeper	51	44	19	83	19	21
Wrens	House Wren	2	1	0	2	1	10
	Winter Wren	7	5	2	8	1	20
Kinglets	Golden-crowned Kinglet	314	351	189	758	113	21
	Ruby-crowned Kinglet	87	68	37	171	20	21
Thrushes	Veery	3	4	3	10	1	18
	Gray-cheeked Thrush	17	14	9	41	1	21
	Swainson's Thrush	76	34	19	79	10	21
	Hermit Thrush	34	38	18	87	15	21
	American Robin	10	16	9	36	1	21
Mockingbirds & Thrashers	Gray Catbird	4	5	3	12	1	21
	Brown Thrasher	2	1	1	2	1	6
Waxwings	Cedar Waxwing	7	26	33	117	1	20
Finches	Purple Finch	1	4	4	17	1	19
	Pine Siskin	67	22	44	170	2	14
	American Goldfinch	5	9	10	30	1	14
New World Warblers	Tennessee Warbler	5	11	11	44	2	20
	Orange-crowned Warbler	10	15	8	28	3	21
	Nashville Warbler	70	35	17	78	14	21
	Northern Parula	4	2	1	2	1	8

Group	Species	2022	Av.	StDev.	Max.	Min.	#
New World Warblers	Yellow Warbler	2	4	3	13	1	18
	Chestnut-sided Warbler	7	2	2	8	1	19
	Magnolia Warbler	21	21	7	35	11	21
	Cape May Warbler	15	4	4	12	1	16
	Black-throated Blue Warbler	17	13	4	21	2	21
	Myrtle Warbler	64	85	42	204	34	21
	Black-throated Green Warbler	93	59	32	116	14	21
	Blackburnian Warbler	8	4	3	10	1	16
	Palm Warbler	8	7	5	22	1	21
	Bay-breasted Warbler	10	13	21	93	1	19
	Blackpoll Warbler	8	12	9	32	3	21
	Black and White Warbler	52	27	17	91	9	21
	American Redstart	77	93	40	198	44	21
	Ovenbird	11	17	5	31	10	21
	Northern Waterthrush	2	6	4	15	1	21
	Mourning Warbler	1	3	1	4	1	16
	Common Yellowthroat	40	27	8	47	17	21
	Wilson's Warbler	3	6	3	12	1	21
	Canada Warbler	7	4	2	7	1	21
New World Sparrows	Eastern Towhee	1	2	2	4	1	3
	American Tree Sparrow	103	27	24	94	2	21
	Chipping Sparrow	1	2	2	6	1	17
	Savannah Sparrow	3	3	3	11	1	13
	Fox Sparrow	7	3	2	7	1	19
	Song Sparrow	21	14	5	23	5	21
	Lincoln's Sparrow	9	6	3	13	1	20
	Swamp Sparrow	10	5	2	11	1	20
	White-throated Sparrow	58	73	41	199	27	21
	White-crowned Sparrow	84	45	27	126	17	21
	Slate-coloured Junco	174	91	39	184	24	21
Cardinals & allies	Indigo Bunting	2	2	2	5	1	14

For 2023, record high captures in red, second-highest total in orange.

Av.: Average; StDev: Standard Deviation; Max: Maximum; Min: Minimum; #: Number of previous fall seasons with captures.

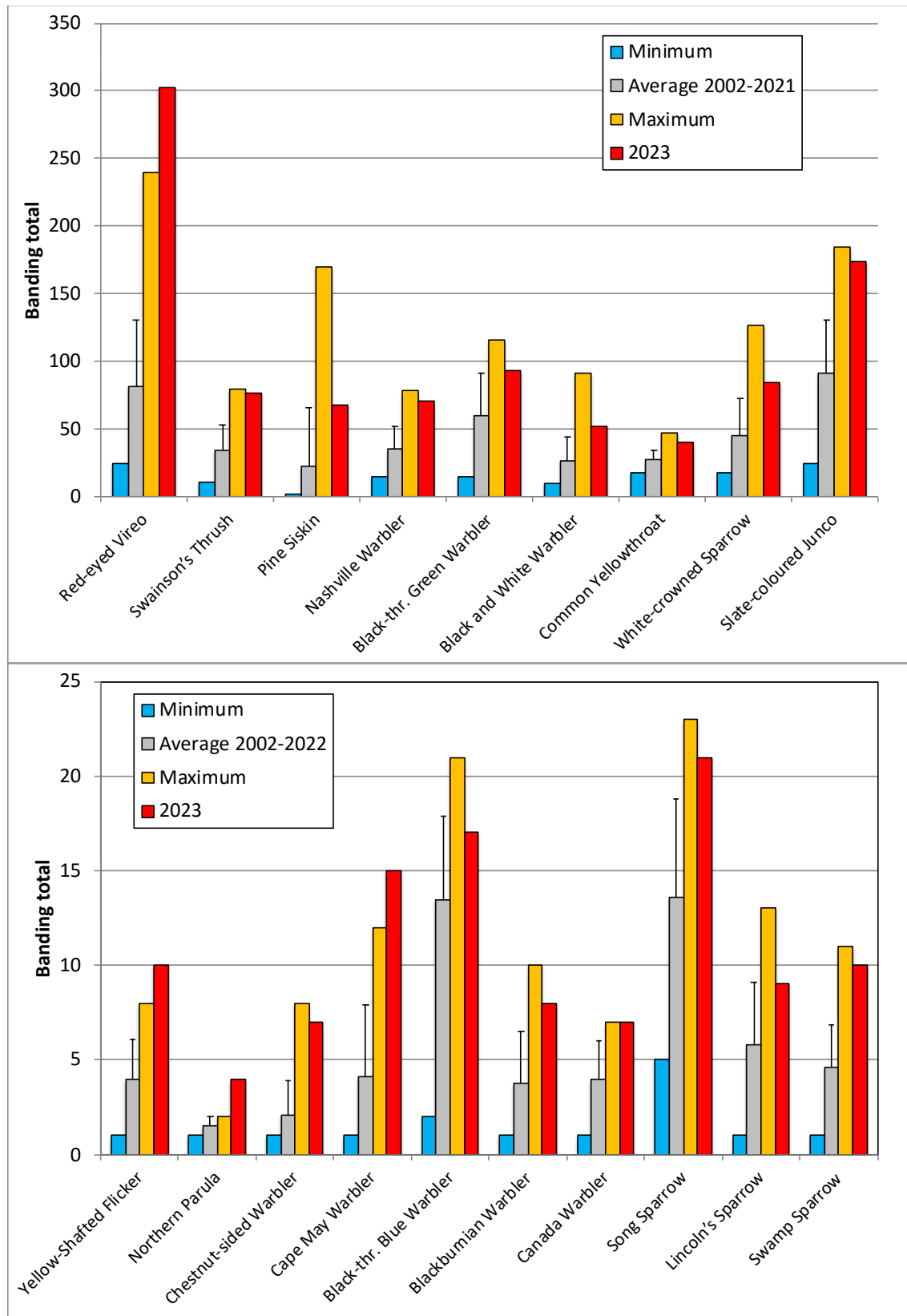


Figure 19. Banding totals of selected species at CHRS during the fall season (average 2002-2022, minimum and maximum and 2023). Error bars show Standard Deviation.

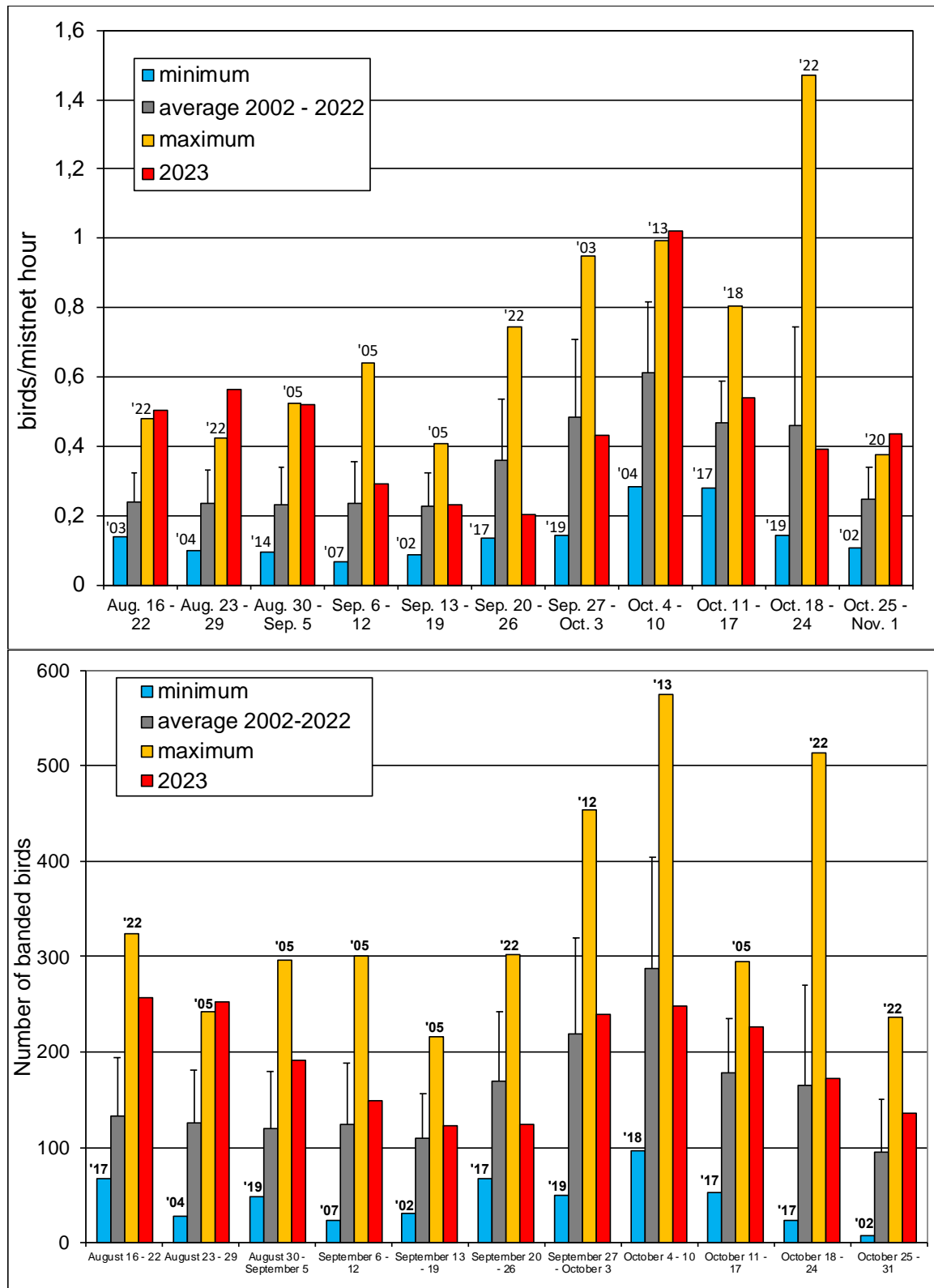


Figure 20. Weekly capture rates (top) and number of banded birds (bottom) at CHRS during the fall season (average 2002-2022, minimum and maximum with corresponding year and 2023). Error bars show Standard Deviation.

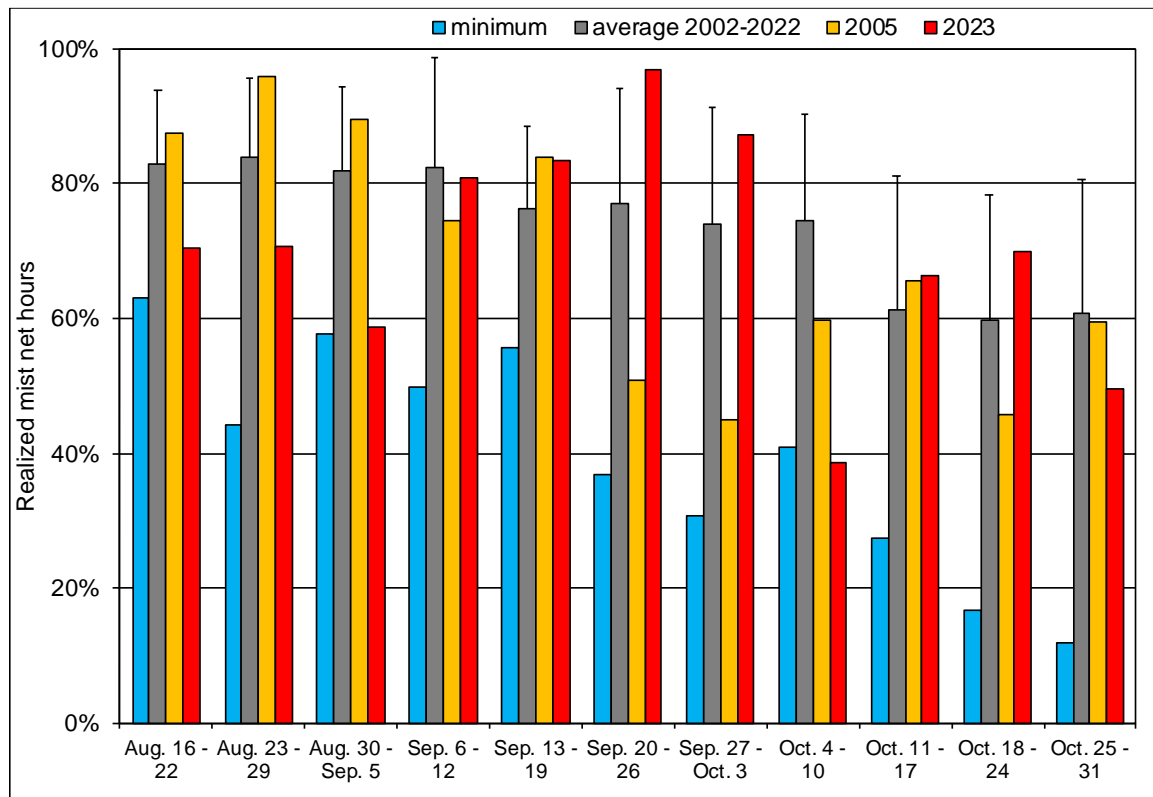


Figure 21. Weekly proportion of realized mist net hours at CHRS during the fall season (minimum, average 2002-2022 and 2023). Error bars show Standard Deviation.

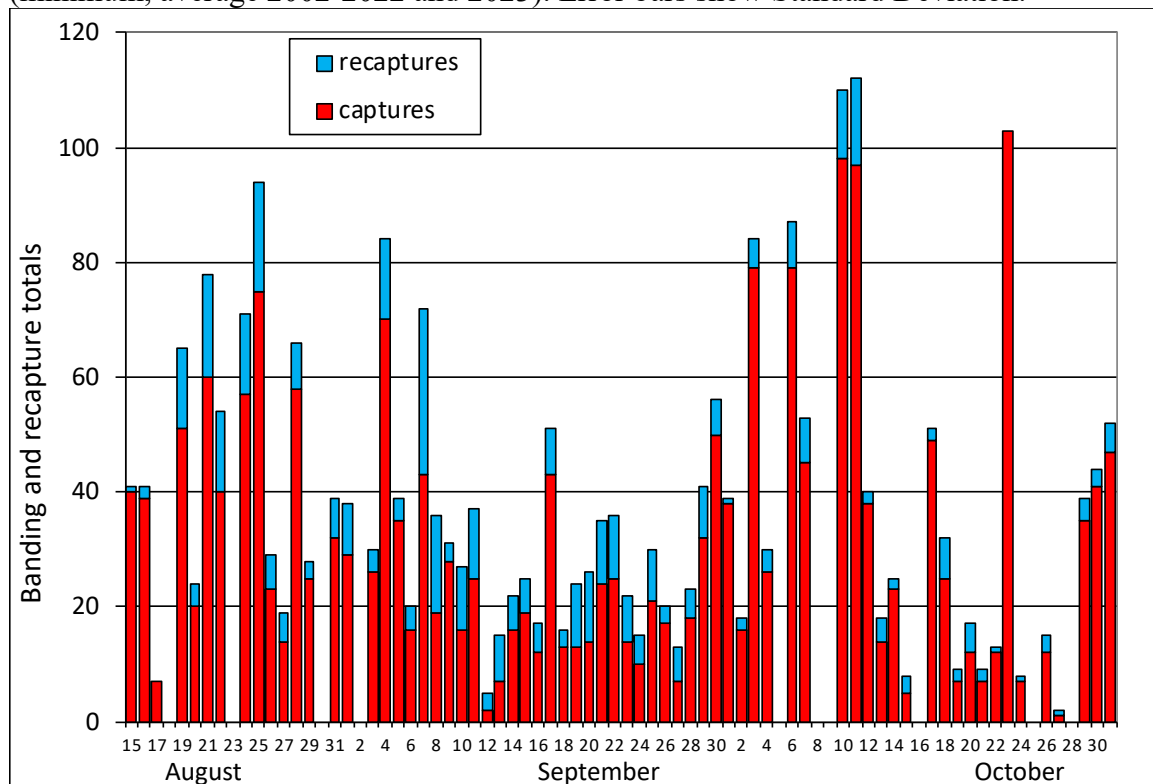


Figure 22. Daily number of captured and recaptured birds at CHRS, fall 2023.

Comparison between Falls of 2005 and 2023

As previously noted, the banding total of fall 2023 is the fourth highest and one of six fall seasons with over 2000 birds banded ((2003, 2005, 2013, 2021 and 2022)). A review of the preceding five seasons indicates that the top five species banded (accounting for over 50% of a season total) very often fluctuate from year to year. For example, in fall 2023, Black-throated Green Warbler and American Tree Sparrow are among the top five species banded whereas they are absent from the top-five list for the other five fall seasons with high banding totals. Even when the top five species banded remain the same across multiple years, their numbers show large variations (see Menu 2022 for more).

Fall 2005 was remarkable for the record numbers of berry-eating species banded: Red-eyed Vireo, Cedar Waxwing, Myrtle Warbler, and White-throated Sparrow. Only in 2023, 18 years later, was one of these records finally broken: as indicated throughout the report, 302 Red-eyed Vireos were banded in fall 2023, compared to 239 in fall 2005 (Fig.23). In fall 2023, Red-eyed Vireos were seen feeding on serviceberries because most of the chokecherries that were intensively consumed in fall 2005 had been cut down by the local beavers. It remains to be seen if the unique conditions of fall 2005, during which the four species mentioned were captured in record numbers simultaneously, will ever be replicated.

Based on 3-day totals (to smooth stochastic daily events), there were more captures of Red-eyed Vireos in 2023 than 2005 from August 15 to mid-September (Fig.24), except for one 3-day period (in late August). From mid-September onward, 3-day totals in 2005 were consistently higher than in 2023, although both declined rapidly, with very few birds after September 22. Average weights of captured Red-eyed Vireos were very similar between the two fall seasons ($17.3 \pm 1.4\text{g}$ in fall 2023; $17.2 \pm 1.3\text{g}$ in fall 2023; average 2002-2023: $17.2 \pm 1.3\text{g}$; range: $16.1 \pm 1.2\text{g}$ in 2021 - $17.8 \pm 1.9\text{g}$ in 2020), with no significant differences on a weekly basis. Despite the relatively similar weight values, Red-eyed Vireos had less fat on average per week in 2023 than 2005 (Fig.25), which might have led to birds in fall 2023 to stay longer at Cabot Head, potentially explaining the different proportions of recaptures during these two seasons: in fall 2005, 16% of birds were recaptured (i.e., 38 birds), whereas in fall 2023 the figure was 25% (or 74 Red-eyed Vireos; Fig.26). Nonetheless, the heaviest Red-eyed Vireo ever captured at Cabot Head was this fall, on September 30, with a weight of 24.8g (and a fat score of 7), being 43% heavier than the

average Red-eyed Vireo of the season. In the previous fall seasons (2002 - 2022), the heaviest vireo was captured on September 26, 2019 and weighed 23.8g.

The apparent lengths of stay (i.e., numbers of days between first and last captures) of recaptured Red-eyed Vireos were relatively similar between falls 2005 and 2023 (average of 5.2 ± 3.8 days in 2005 vs. 5.4 ± 3.3 days in 2005). However, in fall 2023, recaptured Red-eyed Vireos gained on average more weight than in fall 2005 (average of 1.1 ± 1.5 grams in 2005 vs. 0.7 ± 1.2 days in 2005; Fig.27). Weight gain varies on a weekly basis, although interpretation is difficult because of small samples sizes (notably in fall 2005). For both falls, but more pronounced in fall 2023 when sample sizes are larger, there is a decreasing length of stay as the season progresses, which mirrors the migration pattern: in mid-August, Red-eyed Vireos are not fully in migration mode compared to September, especially later in that month, so they potentially can linger more. Weight gain does not seem to be correlated with the apparent length of stay, with relatively greater gains in mid-September, likely again mirroring migration activity. The decline in average weight gain in the second half of September could be due to a decline in food availability, combined with variation in physiology and fitness of recaptured birds. Individual differences, both in length of stay and weight change, are evident and possibly very important. In fall 2023 (all the following examples are from fall 2023), the last Red-eyed Vireo to be recaptured was originally banded on September 22 and was recaptured six days later weighing 2.5g more. A Red-eyed Vireo banded early in the season, August 21, exhibited the longest apparent stay (23 days) but on its third and last recapture on September 13, its weight was slightly lower than at first capture (by 0.3g). Two birds first captured one day apart (September 4 and 5) and last recaptured one day apart as well (September 13 and 14) had thus the same apparent length of stay (10 days) but very different weight trajectories: a gain of 3.5g for one, a loss of 0.6g for the other. While these birds experienced the same conditions, being at Cabot Head at the same time, their respective outcomes were quite different. Extremes in weight change are illustrated by two birds with the same apparent length of stay (seven days), one banded on August 19 losing 0.9g (a 5% decrease), and the other one banded on August 27 gaining 4.2g (a 28% increase). However, the biggest weight increase (29%) occurred for a Red-eyed Vireo banded on September 1, weighing 15.5g, and recaptured three days later on September 4 with a weight of 20.0g. These examples are a clear illustration of the large variations between individuals in physiology, fitness, and behaviour.

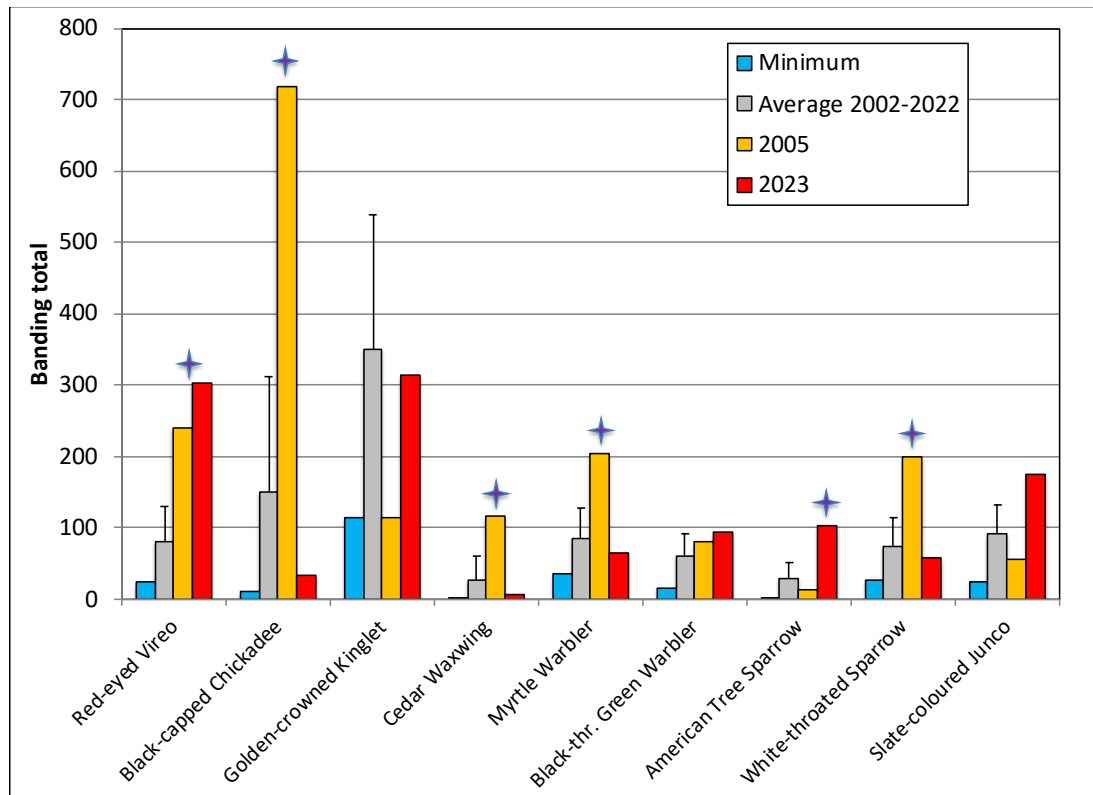


Figure 23. Banding totals of the five most banded species in falls of 2005 and 2023. The stars indicate record banding totals for the 2002 - 2023 period.

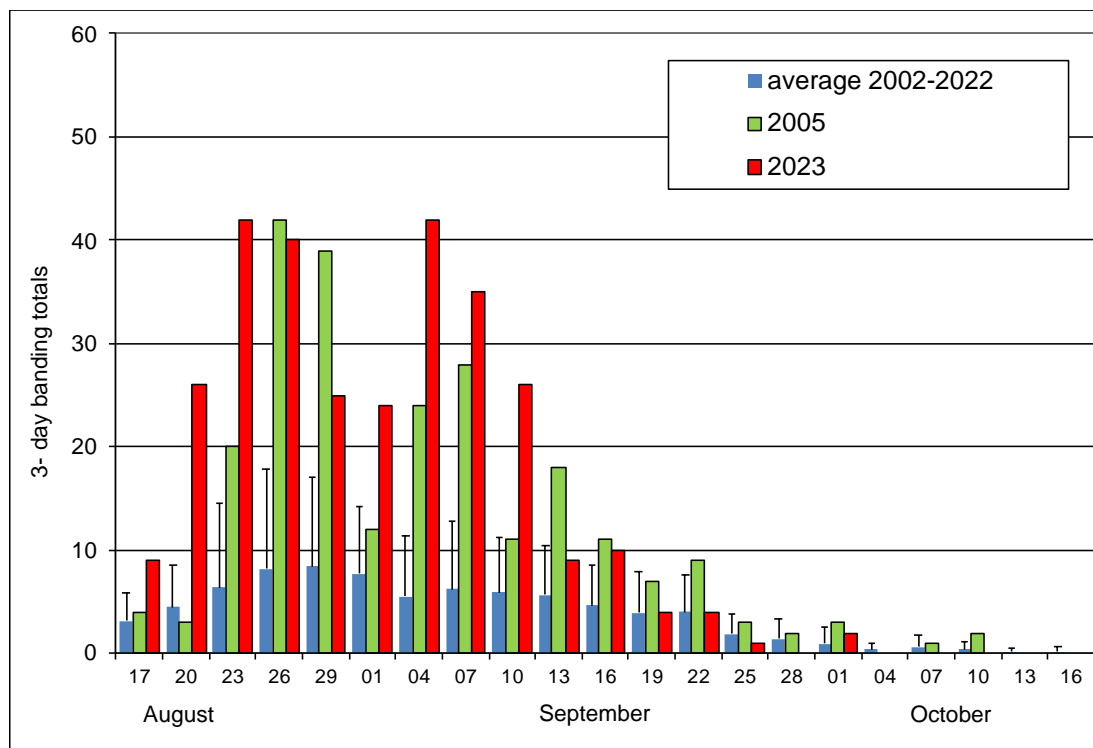


Figure 24. 3-day banding totals of Red-eyed Vireos in falls of 2005 and 2023 and average 2002 - 2022.

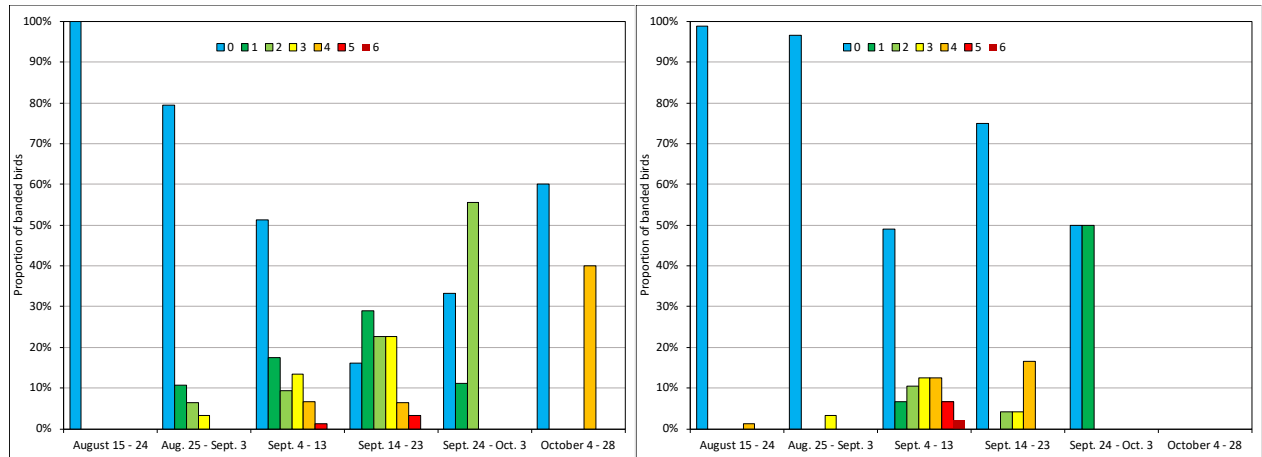


Figure 25. Fat content of red-eyed Vireo in relation to time at CHRS, falls 2005 (left) and 2023 (right) at CHRS.

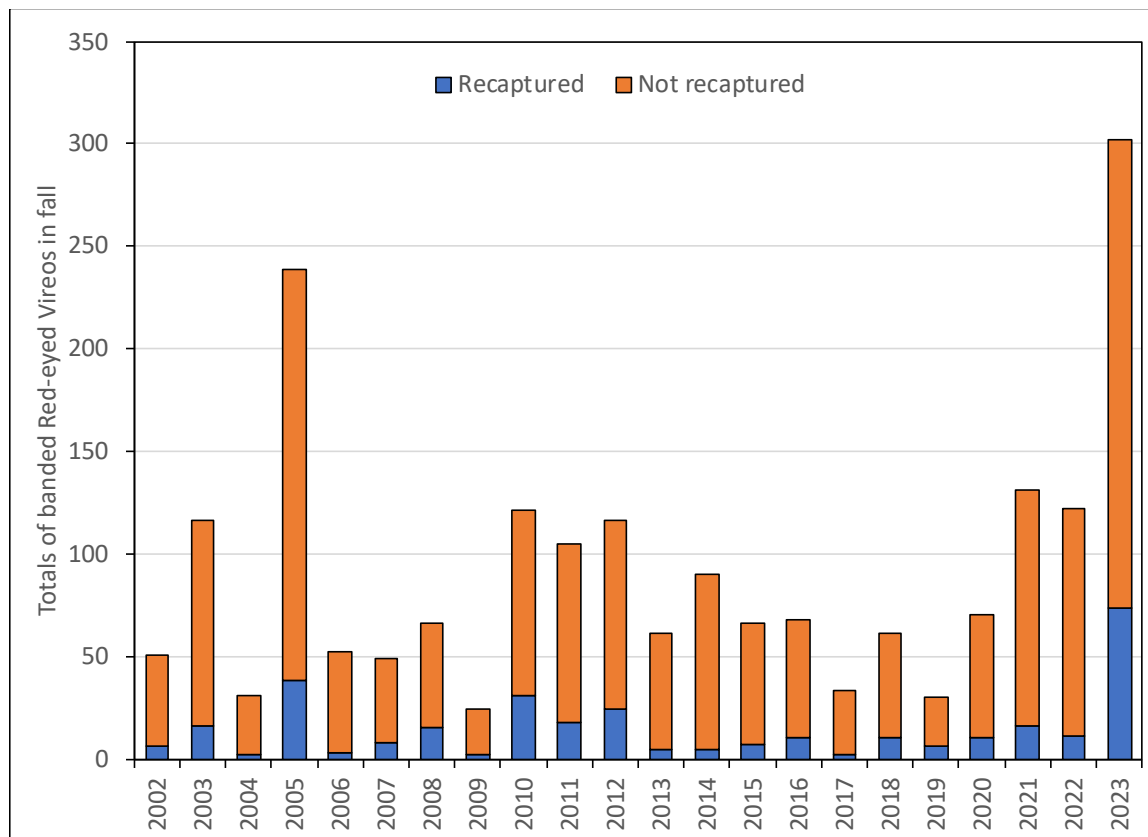


Figure 26. Banding totals (with birds recaptured highlighted) of Red-eyed Vireos in fall seasons across the years at CHRS.

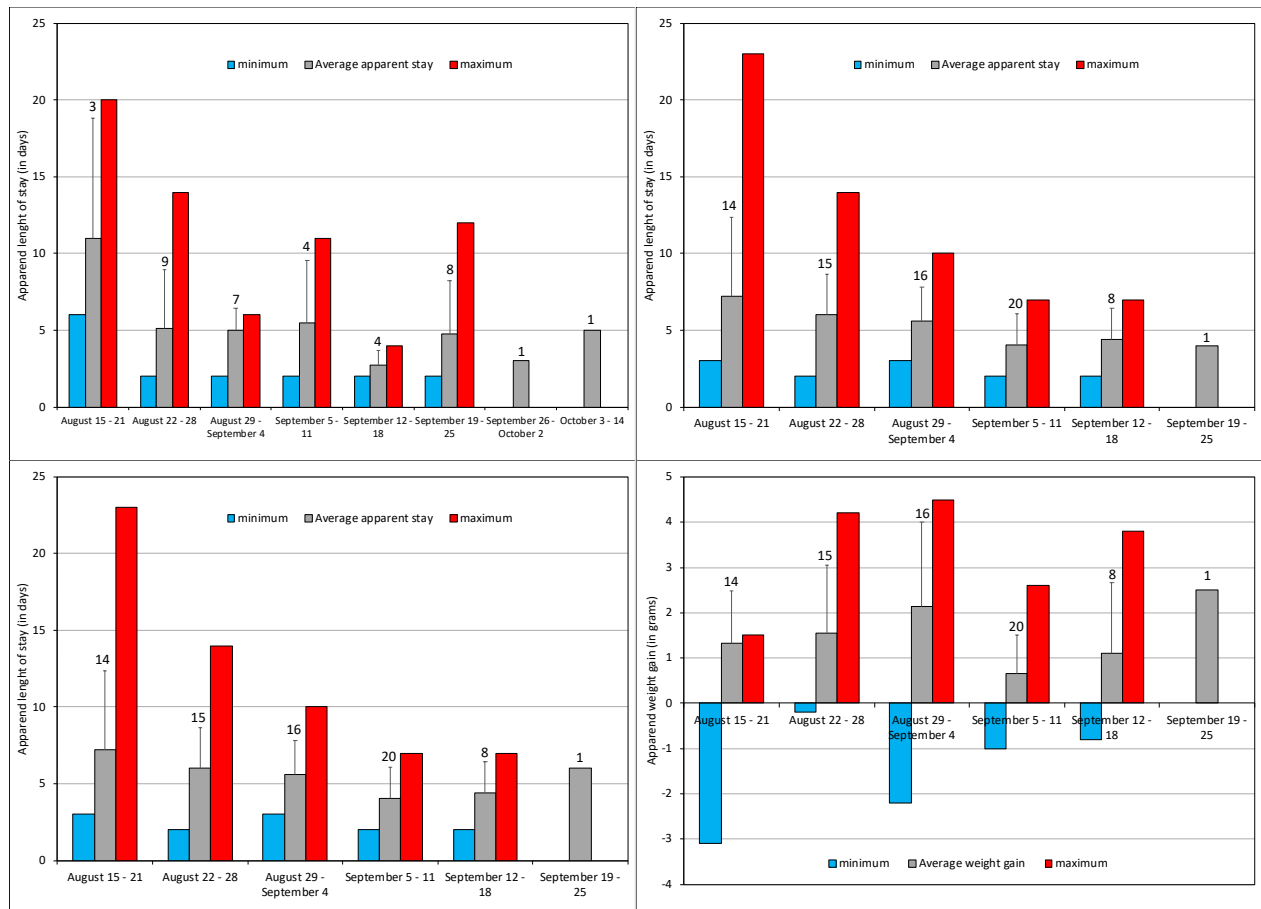


Figure 27. Weekly apparent length of stay (top) and weight change (bottom) for Red-eyed Vireos recaptured in fall 2005 (left) and 2023 (right) at CHRS.

5. Recaptures

There was a total of 459 recaptures from August 15 to October 31 of 310 individuals of 33 species (Table 4). Almost all recaptures (96%) came from birds banded this fall. In total, 89% of the recaptured birds were recaptured once or twice during the fall (69% and 20%, respectively). One Downy Woodpecker, one Common Yellowthroat, and one Dark-eyed Junco, all banded this fall, were recaptured five times, with another Dark-eyed Junco recaptured seven times. Both these two Juncos were banded in August, likely as local fledged young, which could explain their long stay at Cabot Head.

The 13 birds of five species banded in previous seasons and recaptured this fall are most likely local breeders, with 10 of them American Redstarts, the most common local breeder bird at Cabot Head. Among the recaptured species, two Red-eyed Vireos, two American Redstarts, and

one Common Yellowthroat were banded in the spring of 2023, indicating that Cabot Head likely was the terminal destination of their migration. The other eight birds, all American Redstarts, were variously banded from spring 2019 to fall 2022, with all but two having a previous history of recaptures at Cabot Head (Table 3). For example, a female American Redstart banded as a one-year-old in summer 2020 and recaptured this fall had also been previously recaptured in spring 2022. Nonetheless, from the time of original banding to fall 2023, there were six occasions of recaptures (from fall 2020 to spring 2023). Because this bird was banded in summer, it is undoubtedly a local bird, which should increase its likelihood of recaptures. It was recaptured twice in spring 2022 but never in the other five seasons, a small but telling point of the rarity of recaptures. In contrast, the Redstart banded in spring 2019 was recaptured in four subsequent seasons (out of a potential eight) before being recaptured again in fall 2023 (Table 3).

Among 1880 birds banded (of 33 species), 297 birds were recaptured, i.e., 14%, albeit with considerable variations between species. For species with more than 30 individuals banded, the within-season recapture rates varied from 1% (Ruby-crowned Kinglet) to 48% (Common Yellowthroat; Table 4). Many factors may influence recapture rates: local weather (e.g., extended periods of fog or rain could ground birds for longer); food availability (which likely varies depending on species); physiological conditions (the need to replenish fat reserves or not); behaviour (e.g., foraging low or on the ground may increase the chance of being captured). This fall, seven of the 17 species with more than 30 individuals had a recapture rate above 20%, notably, Red-eyed Vireo, White-crowned and White-throated Sparrows, Swainson's and Hermit Thrushes. Food availability was possibly the reason for birds staying longer and being recaptured for these species this fall, as these species show large variations between years in their recapture rates. In contrast, Common Yellowthroat tends to have recapture rates high to very high every fall, likely a consequence of their foraging behaviour low in shrubs. Locally abundant breeding species tend also to be recaptured in high proportions: 25% of the 302 Red-eyed Vireos were recaptured, as well as 16% of American Redstarts. A remarkable 35% of the 52 Black-and-white Warblers banded this fall were recaptured. Despite being captured in high numbers, only 3 to 11% of Golden-crowned Kinglets (6% this fall) are ever recaptured during the same season, indicating a quick movement through Cabot Head.

One young Slate-coloured Junco, after its initial banding on August 15, was recaptured seven times from August 16 to October 4, for an apparent stay of 51 days (there is no way to know

if this bird was present before its first or after its last capture). After an original measure of 17.4g, its weight fluctuated slightly, reaching a high of 18.8g on September 22 and a final weight of 18.5g, an 8% increase overall. Another Junco, also banded as a young bird on the first day of banding, was recaptured five times from August 24 to September 26 (an apparent stay of 43 days). It gained weight rapidly, reaching a high of 18.7g on September 7, a 15% increase. It was recaptured on September 8 and 10 with barely any change (18.5g and 18.6g, respectively). However, the final recapture later in the seasons, September 26, showed a decline to 17.8g. One Swainson's Thrush, recaptured four times through the season, was originally banded on September 7 with a weight of 32.1g, much higher than the average of 29.7 ± 2.7 (of the 67 Swainson's Thrushes banded). Recaptured ten days after initial banding, its weight had dropped to 29.2g. The next three recaptures, from September 18 to 21, showed a remarkable increase in gain to a final 32.6g, a 11.6% increase in five days. These examples illustrate both the importance of high-quality stopover habitats and variation among species and individuals.

Table 3: History of recaptures of American Redstarts banded before and recaptured in fall 2023. (Colour indicates recaptures with number of recaptures per individual)

B_year	B_season	n	2019	2021			2022		2023	
			Fall	Spr.	Sum.	Fall	Spr.	Fall	Spr.	Fall
2019	spring	1	2	2	1		1			1
2020	summer	1					2			1
	fall	1				1				1
2021	fall	1						1		2
		1							6	1
		1								1
2023	spring	5								1

B: Banding; Spr.: spring; Sum.: summer *n*: numbers of individuals with the same history of recapture

Table 4. Total recaptures by species in relation to year and season of banding (only one recapture per individual is included) at CHRS, fall 2023.

Group	Species	'19	2020		'21	2022		2023		%
		S.	Su.	F.	F.	S.	F.	S.	F.	
Woodpeckers	Downy Woodpecker								2	20%
	Hairy Woodpecker								1	17%
	Yellow-Shafted Flicker								2	20%
Vireos	Philadelphia Vireo								2	33%
	Red-eyed Vireo							2	74	25%
Crows & Jays	Blue Jay								3	21%
Chickadees	Black-capped Chickadee								10	31%
Creepers	Brown Creeper								9	18%
Wrens	Winter Wren								1	14%
Kinglets	Golden-crowned Kinglet								19	6%
	Ruby-crowned Kinglet								1	1%
Thrushes	Veery								1	33%
	Gray-cheeked Thrush								4	24%
	Swainson's Thrush								16	21%
	Hermit Thrush								5	15%
Mimids	Gray Catbird								1	25%
New World Warblers	Nashville Warbler								7	10%
	Chestnut-sided Warbler								1	14%
	Magnolia Warbler								1	5%
	Black-throated Blue Warbler								2	12%
	Myrtle Warbler								8	13%
	Black-thr. Green Warbler								7	8%
	Palm Warbler								1	13%
	Black-and-White Warbler								18	35%
	American Redstart	1	1	1	3	1	1	2	12	16%
	Ovenbird								2	18%
	Common Yellowthroat							1	19	48%
	Canada Warbler								1	14%
New World Sparrows	American Tree Sparrow								8	8%
	Song Sparrow								4	19%
	White-throated Sparrow								15	26%
	White-crowned Sparrow								21	25%
	Slate-coloured Junco								19	11%
	Total général	1	1	1	3	1	1	5	297	16%

%. Proportion of birds banded in fall 2023 recaptured

thr.: throated

6. Personnel

Catherine Lee-Zuck (from Quebec) was present during the entire season, except the final three days (75 days), diligently and seriously doing census every day, except on weather-affected days when the station scientist could relieve her. Acacia Jennins, BPBO's first volunteer from Australia, was at the station from September 29 to October 28, delighting us all with her sweet accent and youthful enthusiasm (Sorry that you didn't get to see a bear, Acacia). Megan Berg, from Florida, gave 16 days of her time. Miriam Oudejans and Tania Havelka (both BPBO board members) helped five and eight days, respectively. Once again, Al Woodhouse, a BPBO friend from the earliest days, spent a few days at Cabot Head in August. In total, the six volunteers contributed 135 person-days to the fall migration monitoring season. Big thanks to them!

7. Conclusion

Now firmly in its third decade, bird migration monitoring at Cabot Head was done daily from August 15 to October 31, thanks, notably, to a dedicated team of volunteers. The continuing monitoring effort throughout the years adds details and refines and extends our knowledge the natural history of bird migration on the Bruce Peninsula.

This fall, the banding total was the fourth-highest ever, surpassing the 2000-bird mark, with some record numbers for a few species, notably, Red-eyed Vireo and American Tree Sparrow. The former finally broke an 18-year-old record from the exceptional fall 2005; the latter is a perfect example of the stochastic nature of migration, with the last three days accounting for half the season banding total for this species. Quite a few other species were banded in record (or near-record) numbers this fall, notably, six of the 11 species of sparrows banded.

There was an irruption of Pine Siskin, with very high numbers in late October, the only "winter finch" showing strong movements this fall. Irruptions of this species appear to have happened during 10 fall seasons, notably, 2011 and 2014. Despite observations being limited sometimes by the high volume of banding, 145 species of birds were detected, including rare species (Townsend's Solitaire and Swainson's Hawk), as much a matter of luck as vigilance.

Continuing migration monitoring at CHRS contributes to the efforts of the CMMN and ultimately to our general understanding and monitoring of bird populations as a whole.

Acknowledgements

As a non-profit, volunteer-based initiative, the Bruce Peninsula Bird Observatory would not be operable without the overwhelming support of its membership, financial supporters, and volunteers. BPBO wishes to thank Ontario Park for their continued support.

The author wishes to thank all the members of the Bruce Peninsula Bird Observatory for their support during the field season. I would also like to commend the volunteers who helped make the field season efficient and enjoyable. It is an honour and a privilege to work for BPBO.

Land acknowledgement

“We acknowledge with respect, the history, spirituality and culture of the Anishinaabe peoples on whose traditional territories we gather and whose ancestors signed Treaties 82, 45 ½ and 72 with our ancestors. We recognize also, the Great Lakes Metis whose ancestors shared this land and these waters. May we all, as Treaty People, live with respect on this land, and live in peace and friendship with all of its diverse peoples.”

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Appendix I

Table 5. Season total of species observed in fall 2023 at Cabot Head Research Station, with maximum and minimum daily totals, number of days with observation, and dates of first and last observation.

Group	Species name	Season Total	Daily Max.	Daily Min.	Days with obs.	First date	Last date
Ducks, Geese & Swans	Canada Goose	1629	738	1	42	21 Au.	27 Oc.
	Tundra Swan	4	4		1	31 Oc.	
	Wood Duck	4	4		1	1 Oc.	
	Gadwall	1	1		1	27 Oc.	
	American Wigeon	8	8		1	27 Oc.	
	American Black Duck	5	5		1	27 Oc.	
	Mallard	36	13	1	8	16 Se.	27 Oc.
	Northern Pintail	31	24	7	2	22 Se.	21 Oc.
	Green-winged Teal	2	2		1	16 Se.	
	Redhead	2	2		1	15 Se.	
	Ring-necked Duck	1	1		1	4 Oc.	
	Surf Scoter	1	1		1	15 Oc.	
	White-winged Scoter	69	20	1	13	19 Se.	29 Oc.
	Black Scoter	7	5	2	2	17 Oc.	27 Oc.
	Long-tailed Duck	201	94	1	8	18 Oc.	29 Oc.
	Bufflehead	1	1		1	28 Oc.	
	Common Goldeneye	8	4	1	3	27 Oc.	29 Oc.
	Hooded Merganser	5	5		1	13 Se.	
	Common Merganser	262	33	1	36	29 Au.	31 Oc.
	Red-breasted Merganser	166	55	1	14	24 Se.	30 Oc.
Grouse & Turkeys	Ruffed Grouse	19	3	1	16	23 Se.	31 Oc.
	Wild Turkey	4	2	2	2	15 Au.	23 Au.
Grebes	Horned Grebe	2	2		1	2 Oc.	
	Red-necked Grebe	5	2	1	4	15 Se.	19 Oc.
Pigeons and Doves	Mourning Dove	2	1	1	2	16 Au.	4 Se.
Cuckoos	Black-billed Cuckoo	1	1		1	27 Au.	
Goatsuckers	Common Nighthawk	7	2	1	5	16 Au.	3 Se.
	Eastern Whip-poor-will	2	1	1	2	29 Au.	17 Se.
Hummingbirds	Ruby-throated Hummingbird	130	7	1	33	15 Au.	17 Se.
Cranes	Sandhill Crane	1	1		1	5 Oc.	
Sandpipers & Phalaropes	Greater Yellowlegs	13	3	1	10	4 Se.	31 Oc.
	Solitary Sandpiper	1	1		1	14 Se.	
	Spotted Sandpiper	1	1		1	15 Au.	

Group	Species name	Season Total	Daily Max.	Daily Min.	Days with obs.	First date	Last date
Gulls & Terns	Ring-billed Gull	381	25	1	65	15 Au.	25 Oc.
	Herring Gull	399	44	1	69	15 Au.	31 Oc.
	Caspian Tern	1	1		1	16 Au.	
Loons	Red-throated Loon	2	1	1	2	27 Oc.	30 Oc.
	Common Loon	208	16	1	55	16 Au.	30 Oc.
Cormorants	Double-crested Cormorant	216	20	1	47	15 Au.	24 Oc.
Hérons & Bitterns	Great Blue Heron	8	3	1	5	16 Au.	6 Se.
	Great Egret	1	1		1	28 Au.	
Vultures	Turkey Vulture	48	7	1	17	15 Au.	29 Se.
Hawks, Kites & Eagles	Bald Eagle	164	8	0	69	15 Au.	31 Oc.
	Northern Harrier	1	1		1	5 Oc.	
	Sharp-shinned Hawk	52	10	1	20	16 Au.	29 Oc.
	Cooper's Hawk	12	2	1	11	15 Au.	20 Oc.
	Northern Goshawk	3	1	1	3	21 Se.	22 Oc.
	Red-shouldered Hawk	2	1	1	2	16 Au.	19 Au.
	Broad-winged Hawk	26	7	1	8	15 Au.	8 Se.
	Swainson's Hawk	1	1		1	13 Se.	
	Red-tailed Hawk	8	3	1	6	16 Au.	25 Se.
	Rough-legged Hawk	2	1	1	2	25 Oc.	27 Oc.
Typical Owls	Great Horned Owl	18	2	1	16	16 Au.	21 Se.
	Short-eared Owl	1	1		1	12 Oc.	
Kingfishers	Belted Kingfisher	80	3	1	48	16 Au.	13 Oc.
Woodpeckers	Red-headed Woodpecker	3	1	1	3	26 Oc.	28 Oc.
	Red-bellied Woodpecker	1	1		1	31 Oc.	
	Yellow-bellied Sapsucker	7	2	1	6	28 Se.	13 Oc.
	Downy Woodpecker	123	6	1	56	19 Au.	31 Oc.
	Hairy Woodpecker	71	7	1	43	16 Au.	31 Oc.
	Northern Flicker	451	48	1	49	16 Au.	24 Oc.
	Pileated Woodpecker	88	4	1	41	16 Au.	31 Oc.
Falcons	American Kestrel	4	1	1	4	16 Au.	18 Se.
	Merlin	60	4	1	42	15 Au.	30 Oc.
	Peregrine Falcon	24	3	1	18	20 Au.	29 Oc.
Tyrant Flycatchers	Eastern Wood-Pewee	3	1	1	3	29 Au.	7 Oc.
	Yellow-bellied Flycatcher	9	1	1	9	26 Au.	9 Se.
	Traill's Flycatcher	6	2	1	5	3 Se.	8 Se.
	Least Flycatcher	15	2	1	11	16 Au.	13 Se.
	Eastern Phoebe	2	1	1	2	5 Se.	7 Oc.
	Great Crested Flycatcher	3	1	1	3	22 Au.	28 Au.
	Eastern Kingbird	1	1		1	10 Se.	

Group	Species name	Season Total	Daily Max.	Daily Min.	Days with obs.	First date	Last date
Shrikes	Northern Shrike	2	1	1	2	23 Oc.	25 Oc.
Vireos	Blue-headed Vireo	13	2	1	11	1 Se.	17 Oc.
	Philadelphia Vireo	18	2	1	14	17 Au.	10 Se.
	Red-eyed Vireo	1255	87	1	45	15 Au.	1 Oc.
Crows & Jays	Blue Jay	821	67	1	56	15 Au.	30 Oc.
	American Crow	168	9	1	55	15 Au.	26 Oc.
	Common Raven	188	12	1	64	19 Au.	31 Oc.
Larks	Horned Lark	5	1	1	5	9 Se.	17 Oc.
Chickadees	Black-capped Chickadee	835	38	1	76	15 Au.	31 Oc.
Nuthatches	Red-breasted Nuthatch	275	16	1	52	15 Au.	23 Oc.
Creepers	Brown Creeper	109	14	1	39	15 Au.	31 Oc.
Wrens	House Wren	5	1	1	5	31 Au.	25 Se.
	Winter Wren	32	5	1	17	4 Se.	11 Oc.
Gnatcatchers	Blue-gray Gnatcatcher	1	1		1	30 Au.	
Kinglets	Golden-crowned Kinglet	975	96	1	47	5 Se.	31 Oc.
	Ruby-crowned Kinglet	258	37	1	34	9 Se.	23 Oc.
Thrushes	Eastern Bluebird	4	1	1	4	19 Au.	20 Oc.
	Townsend's Solitaire	1	1		1	22 Oc.	
	Veery	4	1	1	4	29 Au.	12 Se.
	Gray-cheeked Thrush	24	5	1	18	3 Se.	2 Oc.
	Swainson's Thrush	126	11	1	35	21 Au.	11 Oc.
	Hermit Thrush	60	11	1	16	18 Se.	31 Oc.
	American Robin	177	19	1	46	16 Au.	31 Oc.
Mockingbirds & Thrashers	Gray Catbird	14	2	1	11	10 Se.	11 Oc.
	Brown Thrasher	24	4	1	17	15 Au.	12 Oc.
Waxwings	Cedar Waxwing	668	80	1	34	15 Au.	12 Oc.
Pipits	American Pipit	201	23	1	42	2 Se.	23 Oc.
Finches	Pine Grosbeak	1	1		1	29 Oc.	
	Purple Finch	16	3	1	10	16 Au.	31 Oc.
	White-winged Crossbill	234	163	2	5	18 Oc.	25 Oc.
	Pine Siskin	3698	420	1	47	5 Se.	31 Oc.
	American Goldfinch	263	42	1	47	15 Au.	31 Oc.
Longspurs & Snow Buntings	Lapland Longspur	1	1		1	14 Se.	
	Snow Bunting	39	24	1	7	17 Oc.	31 Oc.
New World Warblers	Tennessee Warbler	21	4	1	11	16 Au.	11 Oc.
	Orange-crowned Warbler	18	4	1	12	19 Se.	21 Oc.
	Nashville Warbler	122	12	1	29	15 Au.	12 Oc.
	Northern Parula	8	1	1	8	23 Au.	11 Oc.
	Yellow Warbler	5	2	1	4	16 Au.	5 Se.

Group	Species name	Season Total	Daily Max.	Daily Min.	Days with obs.	First date	Last date
New World Warblers	Chestnut-sided Warbler	13	4	1	9	19 Au.	17 Se.
	Magnolia Warbler	42	7	1	19	15 Au.	6 Oc.
	Cape May Warbler	54	9	1	17	15 Au.	6 Oc.
	Black-throated Blue Warbler	25	4	1	18	15 Au.	10 Oc.
	Myrtle Warbler	729	78	1	57	15 Au.	25 Oc.
	Black-throated Green Warbler	255	29	1	28	15 Au.	29 Se.
	Blackburnian Warbler	24	4	1	11	16 Au.	5 Se.
	Western Palm Warbler	46	13	1	17	1 Se.	12 Oc.
	Bay-breasted Warbler	17	5	1	9	19 Au.	22 Se.
	Blackpoll Warbler	33	13	1	9	26 Au.	28 Se.
	Black-and-white Warbler	150	15	1	30	15 Au.	17 Se.
	American Redstart	356	26	1	41	15 Au.	10 Oc.
	Ovenbird	15	5	1	11	21 Au.	17 Se.
	Northern Waterthrush	2	1	1	2	16 Au.	22 Au.
	Mourning Warbler	1	1		1	4 Se.	
	Common Yellowthroat	255	14	1	47	15 Au.	9 Oc.
	Wilson's Warbler	5	3	1	3	21 Au.	9 Se.
	Canada Warbler	15	2	1	12	15 Au.	21 Se.
New World Sparrows	Eastern Towhee	22	2	1	19	16 Au.	7 Oc.
	American Tree Sparrow	280	55	1	23	9 Oc.	31 Oc.
	Chipping Sparrow	10	3	1	7	20 Au.	12 Oc.
	Savannah Sparrow	6	2	1	5	9 Se.	9 Oc.
	Fox Sparrow	8	3	1	5	3 Oc.	30 Oc.
	Song Sparrow	261	14	1	58	19 Au.	29 Oc.
	Lincoln's Sparrow	28	6	1	17	4 Se.	13 Oc.
	Swamp Sparrow	21	3	1	14	4 Se.	13 Oc.
	White-throated Sparrow	340	23	1	44	31 Au.	31 Oc.
	White-crowned Sparrow	611	66	1	46	11 Se.	30 Oc.
	Dark-eyed Junco	726	55	1	70	15 Au.	31 Oc.
Cardinals & allies	Rose-breasted Grosbeak	3	1	1	3	19 Au.	13 Se.
	Indigo Bunting	3	1	1	3	19 Au.	10 Oc.
New World Blackbirds	Red-winged Blackbird	1	1		1	1 Se.	
	Rusty Blackbird	5	1	1	5	20 Se.	29 Oc.
	Baltimore Oriole	1	1		1	28 Au.	

Appendix II

An edited (for brevity and clarity) version of the blog published during the fall 2023 monitoring season.

The dog days of summer - August 22

[...], we had a great start to the season, operating the 15 nets for the daily six hours on the first two days and catching approximately 40 birds each day. At this time of year, it could be difficult to distinguish birds who have begun their migration from ones who spent their Spring and Summer in the Cabot Head area. Most of the birds captured were species that are locally abundant, so very likely not quite in migration yet: Red-eyed Vireo, American Redstart, Black-throated Green Warbler, Common Yellowthroat, Black-and-white Warbler...

However, we did get a handful of Cape May Warblers, which do not breed on the Bruce Peninsula: evidence that some birds are indeed on the move even in mid-August!

The following two days were battered by strong winds, first from the South, then the North (accompanied with heavy drizzle), which almost completely shut down the banding. Monitoring continued through the census (the standardized one-hour route) and so-called casual observations, revealing very little bird activities, especially on the colder and rainy August 18.

[...], the rest of this first week was enjoyably busy with many birds flying naively into our nets (Ah! Youth!), notably large numbers of Red-eyed Vireos with brown eyes. [...] For other species, many young at this time of year display very fresh plumage in comparison to adult birds. The latter are in the process of moulting their “old” feathers, notably the wing and tail long feathers that went through a lot of use and abuse during the year (singular) of existence. After raising their broods and before embarking on their long migratory flights, adults have finally a little ‘me time’ for self-care, growing brand new feathers in lieu of the worn and faded plumage.

[...], in an ironic twist of “the early watcher gets the bird”, that day [August 21], we captured eight birds in the first three hours and... 69 in the second three hours! [...] serious banding with a good diversity of 16 species, including the record of the day of 17 Red-eyed Vireos! Of note: the first Wilson’s Warbler of the season, and the first Chestnut-sided Warbler banded, among the 11 species of warblers.

[...] “Our” Bald Eagle pair are the proud parents of a young eaglet, very healthy and capable of flying, but still quite dependent on food provided by Mom and Pop, with persistent teenager whining if they are not fast enough in doing so. A young Cooper’s Hawk is being quite the show-off from time-to-time [...]. Early on August 21, a young Peregrine Falcon was flying back and forth around Wingfield Basin, harassing bigger birds (Bald Eagle and Great Blue Heron)!

A Great Horned Owl often was seen perched on the same branch of the same tree on the shore of Wingfield Basin, a perch it might not have left for the whole day, unless a potential prey enticed it. As such, we watched it take off and fly toward a Kingfisher, who escaped easily with a laughing chatter. Not so lucky was the mink we saw listless in the owl talons another morning. The owl flew off into the woods to consume its meal in peace.

Another crepuscular/nocturnal bird was seen in broad daylight: a Common Nighthawk was flying over Wingfield Basin near noon on August 16; a fun observation! [...]

How was the past week? Very REVI! - August 29, 2023

On August 23, rain precluded banding all morning. Clearing at the very end of the monitoring period (7 hours starting 30 minutes before sunrise) brought birds and birders outside. The latter were rewarded notably with 14 species of warblers, including three Cape May Warblers, one Northern Parula, and one Canada Warbler.

Despite a breezy East wind and overcast conditions, banding resumed on August 24 and brought a spectacular haul of 31 unbanded and 6 recaptured Red-eyed Vireos (aka REVI in the four-letter code used by banders)! Even more remarkable was the net A1 at 7:30am with 18 REVIs in it (and an additional Philadelphia Vireo for good measure). Three of these REVIs were already banded. Daily totals of banded REVIs in the fall seasons from 2002 to 2022 have exceeded 15 birds in only five days (out of 599 days with banding of Red-eyed Vireo), with the highest total reaching 19 birds on two days in fall 2005. So, basically, in one single net in one single net round, we got almost as many REVIs as the highest catch in all the previous fall seasons. The 31 birds banded that day completely smashed the previous record! The following day, August 25, 27 REVIs were banded, 9 recaptured, and many observed without a band. That day was very diverse both for banding and observation, with a final tally of 75 birds of 16 species banded, including 12 Black-throated Green Warblers and 8 American Redstarts (among the 11 species of warblers captured).

On August 26, a strong North wind blew slowly away the blanket of clouds covering our little patch of Earth. It was a quieter day at the nets and in the woods, with only 23 birds of nine species banded and a meagre nine REVIs. The bust of the typical boom-and-bust cycle of migration continued the next day. Under a clear sky and a decreasing East wind, very few birds were seen, heard, or caught (only four REVIs that day).

The first crisp and chilly dawn of the fall arrived on Monday, August 28, under a clear sky and no wind. [...] The REVIs once again stole the show with 18 birds being banded. A Swainson's Thrush in the nets was the vanguard of the long-distance Catharus thrushes (the Swainson's, the Grey-cheeked, and the Veery), who migrate through Cabot Head mostly in September on their way to the northern Andes. On that day, a Great Egret was spotted on census by Catherine: it is the fifth time with observation in the fall (last in 2018), with two more observations in the spring of 2005 and 2022. Sparse!

Warmth returned with the strong South wind on the morning of August 29. The wind required us to furl most of the nets after a few hours, as one does not want to see birds swinging wildly in a billowing net. Rain was also approaching fast and started around 11am, forcing us to close the reminding of the nets an hour earlier than normal. As a consequence, the banding total was modest, with REVI still being the most abundant, albeit with only seven birds. Many more were observed flying high and fast in the trees, with about 40 birds counted in total.

The total for the week of August 23 - 29 is 251 birds, eight birds more than the long-standing record of 2005 for that week. Weekly totals are a good way to smooth the large daily variations in banding and allow quick comparisons between years. Of the 11 weeks of monitoring in a fall season, five have their highest total in fall 2005 and four in 2022, these years - not surprisingly - having the second and highest banding totals overall. [...]

A very windy week! And still very REVI! - September 5, 2023

Over the past week (from August 30 to September 5) we experienced strong and persistent winds for four days; winds that were fierce enough to completely preclude banding on two days and allow

only a subset of the nets to be open on the other two. As a consequence, the number of mist-net hours realized for this week has been the lowest on record, accounting for only 51% of the potential. On August 30, there was a ferocious North wind under an overcast sky that kept the nets closed and most birds safely tucked away in the trees and shrubs. On September 2 and 3, the wind was warm and from the South blowing furiously without respite, slightly less so on the second day, permitting the most sheltered nets to be open. It was another morning of strong and warm South wind on September 5, albeit diminishing enough towards the end of the morning to open all the nets.

Nonetheless, when we could open the nets, we captured good numbers of birds, notably on the perfectly calm day of September 4 we banded 70 birds of 27 species and 14 recaptured of four species. Once again, the stars of the day were REVI (Red-eyed Vireos) with 31 banded and nine recaptured.

[...] a young Red-eyed Vireo was captured for the first time on August 31, where its fat level was noted at 0 (zero; on a scale of 0 to 7) and its weight was 17g. Four days later, on September 4, the same bird was recaptured, this time with a fat level of 6 ('greatly bulging') and a weight of 21g. In this short span of time, it increased its weight by 23.5%, a remarkable physiological feat and a sure proof that this bird is getting ready for the long and sustained effort of migration. [...]

We noted a marked surge in numbers of Swainson's Thrush as well as the first Gray-cheeked Thrush of the season. The first (two) American Pipits were heard and seen flying overhead on September 2, with another one the following day. A Blue-gray Gnatcatcher was briefly seen on the windy day of August 28. This species - rare on the Bruce peninsula - is seen almost every spring but not as regularly in the fall: it was detected in 11 fall seasons from 2002 to 2022.

[...] On Sunday, September 3, and on Tuesday, September 5, in both cases, a young Broad-winged Hawk flew into one of our nets, only to be plucked out by an extremely happy bander in charge. In 22 years of migration monitoring, they are the third and fourth Broad-winged Hawks ever captured. The first one was in the spring of 2007, when we released it unbanded: they take special 'lock-on' bands that we didn't have at the time. The second one was on September 7, 2021, which, this time, was duly banded. [...] For comparison purposes, a large REVI might have a wing chord of 80mm and a heavy one a weight of 21g, a Broad-winged Hawk, on the other hand, has a wing chord of about 270mm and a weight of 330g for one and 321g for the other. [...]

A slow change of characters - September 12, 2023

[...] migratory birds are also changing: we are saying good bye, one by one, to the earliest of the long-distance migrants, the warblers, the flycatchers, the hummingbirds, while the first short-distance migrants are making initial appearances. As such, we captured the first Ruby-crowned Kinglet on September 10, the vanguard of many, many more to come, and an early young White-crowned Sparrow was seen on September 11 and 12. The first birds of this species are usually detected in mid-September with the majority of arrivals at the end of the month. A few Lincoln's and Swamp Sparrows have also been observed and banded, as well as White-throated Sparrows. The gaudiness of warblers is being exchanged with the subtleties of sparrows!

American Pipits were heard and seen a few times, notably a small flock of eight on September 10, tumbling down from the sky to explore the rocky shore of Georgian Bay. The American Pipit is a bird of open land and unbroken horizons, at home in the tundra of the Far North or in the alpine meadows of high mountains. In Ontario, it breeds along the shores of Hudson's Bay. Features of its habitat preferences also apply during migration and winter, with it enjoying beaches and

pastures and plowed fields. With nets in shrubby and treed habitats, only four Pipits have ever been caught in 22 years of banding at Cabot Head, one in spring 2016 and three in as many fall seasons (2002, 2004, and 2015).

[...], we broke the 18-year-old record of fall 2005 this past week (239 banded REVI) and easily galloped past it: the current total stands at 273 REVI banded. Numbers captured this past week were not as significant as in the weeks prior, with the one-day highest of ten birds on September 11. Nonetheless, with captures daily and still about two weeks of passage, it seems now quite possible to reach 300 banded REVI in one season...

In September, it is also peak passage for the long-distance Catharus thrushes, the Veery, Swainson's and Gray-cheeked Thrushes, all on their way to South America. These secretive species are mostly detected through banding rather than observation/vocalization. Among this trio, the Swainson's Thrush is always the most numerous, although with considerable variations across the years (fall banding totals range from 10 in 2006 to 79 in 2015). There are already 44 Swainson's Thrushes banded this fall. In fall 2005, only 36 Swainson's Thrushes were banded.

[...]

Saying goodbye to feathered friends... - September 19, 2023

[...] there are still lots of birds around and moving through: mid- to late-September is peak time for migrating Blue Jays and Northern Flickers, for example. With a little help from a strong North wind, Canada Geese are passing overhead in great iconic and loud Vs, over 700 of them on September 18 (and only two geese the following day when no wind was blowing!).

On September 13, a quiet day of overcast sky and a strong North wind, a soaring raptor caught our attention. Unfortunately, it quickly gained even more altitude and much too soon disappear in a long, smooth glide towards the Southern horizon. It was easy enough to identify it as a *Buteo*; the generic group of Red-tailed, Red-shouldered, Broad-winged Hawks and more, based on its size and general silhouette. But the white body and underwings, the darker flight feathers, the long, slim and pointed wings brought confusion and excitement. After much review and careful consideration, it was decided that it was an adult Swainson's Hawk, a western *Buteo* species! This species is somewhat frequently observed East of the Mississippi but it is only, to the best of our knowledge, the second one ever for Bruce county (and Cabot Head), after the immature of Spring 2022.

On September 14, calls alerted us to a Solitary Sandpiper flying over Cabot Head and, later, to a Lapland Longspur. The latter is a rather rare species at Cabot Head, detected in only seven previous Fall seasons, with the earliest also on September 14, in 2013.

It seems that the last week was a good one for rare birds: a pair of Redhead (diving ducks) was seen on Wingfield Basin on September 15, the third ever observation of that species at Cabot Head. An Eastern Whip-poor-will was heard at dusk on September 17, a much more common occurrence in Fall, as its namesake song can be heard until the end of the month.

There was considerably less excitement at the nets this past week, with banding totals quite low most days, except on September 17, with 43 birds of 18 species, notably five Gray-cheeked Thrushes. Red-eyed Vireos are still being banded every day, albeit in much smaller numbers than at the start of this migration season, sometimes only one bird late in the morning [...]. [...]

Bird nomadism - September 26, 2023

One of the most striking features of bird migration is its regularity. Most populations of birds migrate on approximately the same dates, in the same directions, and for similar distances each year, with many individuals returning year-after-year to the same breeding and wintering localities (such a remarkable feat!). However, to have consistency, one needs predictability. Some bird species exploit habitats or food supplies that are highly variable in distribution and abundance from year-to-year. These so-called irruptive migrants show great flexibility in their movement patterns, leaving their breeding areas in varying proportions and at variable dates from year-to-year, and concentrating wherever resources are plentiful at that time. [...]

At Cabot Head, we have noted the first inkling of a potentially strong flight year for Pine Siskins: large flocks of several dozens and up to 100 birds have been seen for a few days, notably on September 20 and 21. [...]

On September 19, the season total of banded Red-eyed Vireo stood at 294. The following three days of banding inched the total upward to 299... and then, there was no unbanded REVI captured for two days, breaking a continuous streak of 39 days of captures (including in that total of days the four days with no banding at all) and leaving us fearful. [...], one REVI, with beautiful blue legs unadorned by any human-made jewellery, was finally captured early in the day on September 25, the official 300th Red-eyed Vireo of the fall 2023 season! [...] Besides fall 2005, in the other 20 fall seasons, only six have totals above 100 REVI, with 131 birds in fall 2020 being the highest. The current record is thus exceptional and might stay in the record book for a long time. [...]

On September 22, a nice contingent of nine species of warblers were observed and/or banded. Here is the full list [...]: Orange-crowned, Tennessee, Magnolia, Cape May, Yellow-rumped, Palm, Bay-breasted Warblers, American Redstart, and Common Yellowthroat. This list has drastically shrunk in the last few days, with often only two or three species commonly detected now, Yellow-rumped Warbler being the most abundant.

American Pipits were seen during the last week most of the days, calling their name while flying [...] or walking the rocks on the beach with their characteristic gait.

The weather this week has been mostly sunny and warm, maybe even too warm: good weather is likely very good for migrating birds but not so much for expecting birders and banders. It seems that birds can simply keep on going and do not need to shelter and refuel as much, bringing down numbers caught. The weekly total is quite below average despite barely any mist net hours lost. [...]

Fat is good! - October 3, 2023

Fat is fuel for migrating birds. [...] Birds during migration spend the non-travelling hours feeding as much as possible to accumulate fat, which they will burn during their long flights. Of course, there is a trade-off on how much fat one bird can put on: the heaviest one gets, the more energy must be expended to stay aloft. Different strategies can be used: at the extremes, a bird can put on very little fat reserves and do short flights with many stops to “refuel” along the way, or a bird can load on fat as much as possible before a ridiculously non-stop flight with no resupply. The Bar-tailed Godwits breeding in Alaska belong to the latter category: prior to their oceanic flight, they almost double their body weight before embarking on an eight- to nine-day (and night) non-stop flight to New Zealand where they spend the winter.

Most birds, however, fall into a happy middle ground. During banding at Cabot Head, we routinely check fat deposits (visible by gently blowing feathers apart on their bodies where they store fat: under the neck, under the wings, and on the belly) of birds we band. Fat score is documented on

a 0 to 7 scale. Many birds have a 0-fat score, which could mean they are not quite in migratory mode or they have used up all their fat and need to replenish their reserves. Often, birds with fat reserves have a 3- or 4-fat scores. Rarely, very, very rarely, a bird scores a 7-fat: that was the case for eight birds in 20 years of banding and 62,593 birds banded. This fall, on September 30, the 301st Red-eyed Vireo (REVI) banded was such a 7, with a weight of 24.8g. The following day, the 302nd REVI (and so far, last) was only a 1-fat with a weight of 17.5g. The average weight of the 302 banded REVI this fall (to date) is 17.3 ± 1.4 g (range: 14.8 - 24.8), with the second heaviest weight being 21.2g and only 18 birds weighing 20g or more. So, our 301st REVI was 43% heavier than the average REVI this fall. In the previous fall seasons (2002 - 2022), the heaviest REVI was captured on September 26, 2019 and weighed 23.8g.

As forecasted, the weather this past week was unseasonably warm, very warm. Days alternated between being very quiet or relatively busy at the nets. Golden-crowned Kinglets have started to move in good numbers through Cabot Head and are now the most abundant bird being banded on any given day: 30 Golden-crowned Kinglets banded on September 30 and 48 on October 3, for example. On that last day, we banded a total of 78 birds of 17 species, which is the highest number of birds banded in a day for the season so far. The distant second and third species were Dark-eyed Junco (six birds banded) and Common Yellowthroat (five birds). We also captured the first Fox Sparrow of the season, as well as the first Yellow-bellied Sapsucker. The young male Pileated Woodpecker may claim the title of best bird captured for that day though, despite its ear-piercing calls. [...] This species has been captured in 13 of the previous 21 Fall seasons, only one bird in each season, except in 2015 (two birds) and 2019 (three birds).

In visual migration, we are still observing a few Northern Flickers and Blue Jays but the bulk of them are behind us now. Likewise, for Canada Goose. The first Horned Grebes, on the contrary, were seen on October 2. We are keeping an eye over the bay as October is the time when ducks and grebes and loons migrate in numbers.

[...]

Warblers in October. - October 9, 2023

In the past week, we likely experienced the last very warm days of the season with highs over 20°C on October 4 and 5, accompanied by lots of rain on the latter. No banding was possible during that day, of course. The following day, October 6, brought clearing skies and an increasing wind. The banding tally was an impressive 79 birds banded, the highest of the season (by one bird!) and eight recaptures. It is possible that birds knew what was coming. Indeed, the change of weather was quite sudden and brutal for the long Thanksgiving weekend: Saturday was marked by an increasing and shifting wind and an overcast sky bringing lots of rain. A break in late morning allowed us to open the nets for three hours, which produced 45 newly banded birds. It was good to have the chance to have the nets in operation since they stayed safely furled on Sunday and Monday while wind and rain unleashed their fury in a suddenly cold air. It is the first massive cold front of the Fall moving through Lake Huron, though certainly not the last.

Golden-crowned Kinglets were again the most abundant birds in our nets when banding was possible, alongside a few Ruby-crowned Kinglets, Brown Creepers, and the occasional Winter Wren. And of course, various sparrows, Hermit and the last Swainson's Thrushes, and the straggler warblers.

Among the Last of Fall, there are a few forest gems (aka warblers) lingering in October, much to our delight. So far, we have recorded a total of ten species of warbler this month. [...], Orange-

crowned, Nashville, Yellow-rumped, and Palm Warblers. These four species are to some extent late migrants and the only ones always seen in October (except Palm Warbler in October 2004[...]). [...] this Fall, four were noted: American Redstart, Magnolia Warbler, Common Yellowthroat, and Black-throated Blue Warbler. In 2023, Northern Parula were banded on October 6 and 7 (one each), a species seen in October in six previous Fall seasons and as late as October 30 in 2016. Cape May Warbler, the tenth species seen so far this Fall in October was detected on October 6, with one banded and one observed. This species is much more rare at this time of year, with one bird on October 2nd in 2018 and one on the 7th in 2021. In 2023, a total of seven warblers were detected on October 6, the day in between rainy days, likely not a coincidence. When it comes to bird migration, the unexpected is always to be expected, so it is possible that another species of warbler will show up before the end of the banding season on October 31. Stay tuned!

Addendum: Tennessee Warbler, the 11th species of warbler for October was seen on the 11th, with two observed and one banded. The blog post was written on Monday the 9th.

Peak days! - October 18

[...] suffering through three days of rain during the Thanksgiving long weekend, we experienced two days of fun and busy banding on October 10 and 11. These were likely the peak days for the Fall 2023 season, with 98 and 97 birds banded respectively (and 13 and 15 recaptures, also respectively). Diversity of banded birds was high during these two days, with 19 species each day, for a total of 26 species over the two days. The most abundant species were both Kinglets and sparrows, notably White-crowned Sparrows (19 and 13 birds, respectively) and Dark-eyed Junco (15 birds on October 11). We also captured the first American Tree Sparrows of the season on these days (two each day). [...]

Over the years, during the 21 previous Fall seasons, it is interesting to note that days with 100 or more banded birds have not happened that often: a grand total of 18 days (or, 1.2% of days with banding in Fall) in only 12 Fall seasons. In other word, a day over 100 banded birds at Cabot Head in the Fall is a remarkable event, most often not happening (oh! so close when 97 or 98 birds are banded...), or happening only once in a season (in eight previous seasons). There were two days with more than 100 banded birds in three Fall seasons. Last Fall, 2022, was exceptional with four days over 100 banded birds, notably the highest ever, 290 birds banded on October 18, and the third highest (164) on October 3. The second highest was on October 8, 2013, with 260 birds banded.

These busy days are mostly in the first ten days of October, with one on September 29 and a few (as mentioned above) after mid-October (latest on October 24, with 101 birds). It is thus likely that we have experienced our peak days for the season this year at Cabot Head. Numbers caught and banded in the days after October 10 and 11 were under 50 birds. Nonetheless, they included a good number of woodpeckers: Yellow-bellied Sapsucker, Downy and Hairy Woodpeckers, and the second Pileated Woodpecker of the season on October 12. The latter has been banded in 13 previous Fall seasons, usually just one bird, but two in 2015 and 2022, and three in 2019.

[...] A Short-eared Owl was seen flying high on the morning of October 12 (although I would not have objected of having it in the nets)! Duck movement over the bay is picking up with Scoters (mostly White-winged, with the occasional Black and Surf) seen in the last week and the first Long-tailed Ducks on October 18. The first Snow Bunting of the season was on October 17, while the first White-winged Crossbills were on October 18. These birds definitely announce the beginning

of the end of the season, as surely as the leaves starting to fall in numbers and the tamaracks turning to gold. [...]

Expect the unexpected! - October 25

On October 22, a Townsend's Solitaire was seen very briefly at Cabot Head (https://www.allaboutbirds.org/guide/Townsend's_Solitaire). This western species regularly strays into the eastern part of the continent, so it might be qualified as an expected unexpected species. Indeed, this Fall's sighting is the sixth record at Cabot Head: the previous ones have all been in October, except one on April 15, 2016 (which was a nice way to start the Spring season!). The fifth record was a bird in our nets on October 10, 2022. None of these birds ever seem to linger, seen only briefly, sometimes with the fleetest of apparition: see them, blink, and they're gone for good. [...]

The past week was marked by absence, as fewer and fewer birds (and species) are present now: many species have had their sad LOF (Last of Fall) now, notably warblers. However, one never knows for sure until the very end of the season: One Orange-crowned Warbler was detected on October 21 and two Yellow-rumped Warblers on October 24. Blue Jay, Northern Flicker, American Crow are almost completely gone too. Hummingbirds, Vireos, and Flycatchers are long gone. Even Kinglets are being heard, seen, or banded in very small numbers now.

The most abundant bird of the past week is Pine Siskin, as anticipated in the Winter Finch Forecast (<https://finchnetwork.org/winter-finch-forecast-2023-2024>). We are seeing lots and lots of them, with daily totals reaching approximately 400 birds on several days. It is devilishly difficult to have a precise estimate of their numbers: they fly in tight and bouncy flocks, practically disappearing in cedars and other trees when they land to feed, and they move quite erratically all over Cabot Head. Pine Siskins like to fly high and feed on tree tops. But from time to time, they would scoop lower, which is why one net captured 51 of them (around noon on October 23): that was a great scoop! Eight more Pine Siskins were banded earlier on that day, as well as five more on October 12, reaching a season total of 64 birds so far, which is the second highest among Fall seasons. Pine Siskins have been banded in 14 of the previous 21 Fall seasons, usually in single-digit numbers. In Fall 2011, however, 170 Siskins were banded, 106 of them on one day, October 3, and 75 of the 106 in one big scoop in the same net (A1) as our current capture, also late in the morning. Back then, one of the Siskins already had a band on: it was banded only two months earlier at the Mackenzie Nature Observatory, in north-central British Columbia, a continent away (3,132 km, as the siskin flies... if the siskin was flying in a straight line). Remarkable!

On October 23, the day of the great Siskin scoop, we ended up banding 103 birds of 11 species (but no recaptures), finally breaking the 100-bird barrier for the season! (see previous post)

Other northern visitors were also detected this past week: a flock of 24 Snow Buntings and one Northern Shrike on the same day, October 23. Their arrival certainly marks the beginning of the end: another season will end once again on October 31. Let's hope for more treats than tricks before it is finally over.

The end of a Fall season is always bittersweet - November 3

As I'm writing these lines on November 3rd, the nets have been taken down and packed away, the banding lab cleaned and closed, and no one is doing the daily census: The Fall season ended once again on October 31st. [...]

The last week was actually quite fun and busy, making it even harder to end... although the big snow squalls on the very last day, October 31st, made it less enticing to keep going. Not too surprisingly for this time of year, the first four days of the week were marred by bad weather, either rain (sometimes heavy) or wind, or a combination of both, making monitoring difficult, even almost impossible at times (except for the daily census; it happens rain or shine).

A Rough-legged Hawk was seen on the rainy day of October 25, freshly (?) arrived from its northern tundra. [...] While Rough-legged Hawks are relatively frequent on the Bruce Peninsula during the winter, they have been detected at Cabot Head in the fall in only five previous seasons from October 12 to 31 with one or two birds at the most.

A young Red-headed Woodpecker was seen three days in a row in the alvar, from October 26 to 28. It is the latest sightings ever recorded for this Species-at-Risk at Cabot Head, which had been previously detected in 14 previous Fall seasons (usually one or two birds at the most).

After very little banding done in the first four days of the week, conditions improved enough to open most of the nets for the six regular hours. And not for nothing: the numbers of birds caught were among the highest - if not the very highest - throughout the years for these last three days, with 35, 41, and 47 birds caught, respectively. Most of the birds banded during this time were American Tree Sparrows, with a total of 51 birds for the three days, bringing the season total to 103 birds. Catching about 50% of the season's total in the last three days of banding is a clear illustration that the American Tree Sparrow is a late migrant. It is likely that in some years, most of its migration is missed at Cabot Head, with birds largely moving through in November. As a consequence, Fall banding totals have been very variable across the years, from a low of four birds in 2018 to a high of 94 in 2015. Yes, the Fall 2023 total of 103 American Tree Sparrow is a new banding record for Cabot Head!

Quite a few Dark-eyed Juncos got banded as well during the last three days, notably 17 birds on October 31. This species breeds in small numbers on the Bruce Peninsula, which is why one Junco was banded as early as August 15 this year. Its migration is also more extended than Tree Sparrows, with birds arriving in numbers from mid- to late- September. Juncos were actually banded almost daily this Fall from mid-September to the end of the season, for a season total of 174 birds, the second highest ever after 184 Juncos in Fall 2021.

During census on October 29, my ears perked up having heard a soft whistle: a female Pine Grosbeak was quietly feeding in a low shrub, giving me perfect views. It is a relatively rare visitor from the Boreal forest, having been detected only in ten previous Fall seasons.

[...] On October 31: a male red-bellied Woodpecker was caught in a net! This sedentary, but with an expanding range, beautiful woodpecker is seen quite regularly at Cabot Head (in 14 of the previous 21 fall seasons) [...]: only eight birds have been banded in six previous Fall seasons (remarkably, three in Fall 2016).

The last day of monitoring also brought a delightful observation of a family of Tundra Swan (with two young) heading South, gently calling while flying in front of Middle Bluff. It is only the third time that Tundra Swans have been detected in the Fall, with a family of four both previous times (October 4, 2014 & October 27, 2022).

[...]

Stéphane
Station Scientist