DATA REPORT

Bird Banding Project at the

Calvert Island Field Station 2016

Report prepared by:

Sarah Chalmers, Kimberley Wetten and Dr. Eric Demers of Vancouver Island University

VANCOUVER ISLAND UNIVERSITY

Hakai
Science on the Coastal Margin

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1. Introduction

Concerns have been raised about the decline of many Canadian bird populations. The North American Bird Conservation Initiative report, *The State of Canada's Birds* (NABCI, 2012), states that Canadian bird populations have declined by an average of 12% since the 1970's. Overall, 44% of bird species in Canada are decreasing – some more drastically than others. Conservation of these species is often hindered by a lack of information on regional- or ecosystem-level declines (Donovan et al., 2002).

Accurate knowledge of population status and change is fundamental to species conservation. In North America, much of this information is derived through annual Breeding Bird Survey (BBS) and observations from the birder community (e.g., eBird database). However, many parts of Canada are relatively inaccessible and few birders are available to count birds in these regions. Consequently, a network of strategically-located bird monitoring and banding stations can provide essential baseline information on avian populations.

Currently, a gap exists in the knowledge of coastal bird migratory patterns between Alaska and southwestern British Columbia. There are bird monitoring stations in the BC Interior (Tatlayoko Lake Bird Observatory, Vaseux Lake Bird Observatory, Mackenzie Nature Observatory) and on the South Coast (Rocky Point Bird Observatory, Iona Island Bird Observatory, Vancouver Avian Research Centre, Vancouver Island University Bird Banding Project) (Figure 1). However, there is no established monitoring station located anywhere on the BC coast north of Nanaimo.

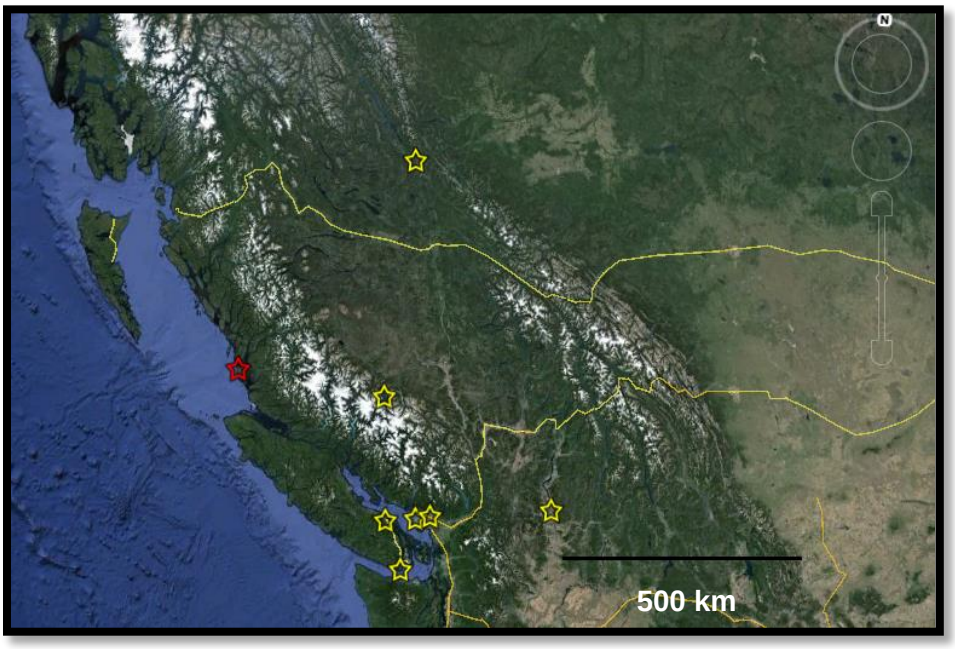

Figure 1. Aerial photograph of British Columbia showing currently established bird banding stations (yellow stars) and the Calvert Island site (red star). Image courtesy of Google Earth © 2015.

Calvert Island, which is situated approximately 100 km north of Port Hardy on the BC Central Coast, has the potential for being an important stopover site for migratory birds using the Pacific flyway. In 2015, Vancouver Island University conducted a banding project on Calvert Island that was continued in 2016 with objectives to:

- monitor migrant and resident birds on Calvert Island; and,
- assess the suitability of the site as a long-term monitoring station.

This project was conducted in partnership with the Hakai Institute, a research and postgraduate teaching institution that advances field-based research in coastal British Columbia, and Vancouver Island University.

This report summarizes the activities and results for the bird banding project conducted on Calvert Island in 2016. Data included from these activities will be considered in forming the assessment of the suitability of the site as a long-term monitoring station. Summaries of public demonstrations / education, as well as social media outreach are also included.

2. Bird Monitoring and Banding

2.1. Methods

The general approach used for songbird monitoring and banding included a combination of two activities: bird banding and incidental observations.

2.1.1. Bird Banding

Songbird banding activities were conducted in accordance with Vancouver Island University Animal Use Protocol No. 2012-10-R, Canadian Wildlife Service Bird Banding Office Scientific Permit No. 10885, No. 10885A and No. 10788H, and following procedures and guidance established in the VIU Bird Monitoring and Banding Manual (Demers, 2015), the North American Banding Council (NABC, 2001a,b), and the Institute for Bird Populations (IBP, 2012).

During the initial year of the project in 2015, twenty-four mist net locations were established around the Calvert Island Field Station (Figure 2; Table A.1 in Appendix). During the time period of May 5-16, 2016, thirteen nets were installed and rotated in stages among 14 locations, and not all net locations were run at the same time. Net rotation was based on capture rates and to ensure a broad coverage of available habitats. Each mist net consisted of a 12 m long by 2.6 m high panel, made of polyester yarn, with 30-mm mesh size.

Bird banding activities were conducted on 10 days during the 2016 time period. During each banding day, nets were operated from 30 minutes before sunrise and for a period of up to 6 hours (i.e., until 5.5 hours after sunrise). Timing of net opening / closing was weather-dependent, and was altered due to rainfall and/or high winds. Nets were checked every 20-30 minutes. While not in use, all nets were closed and furled tightly to prevent inadvertent capture.

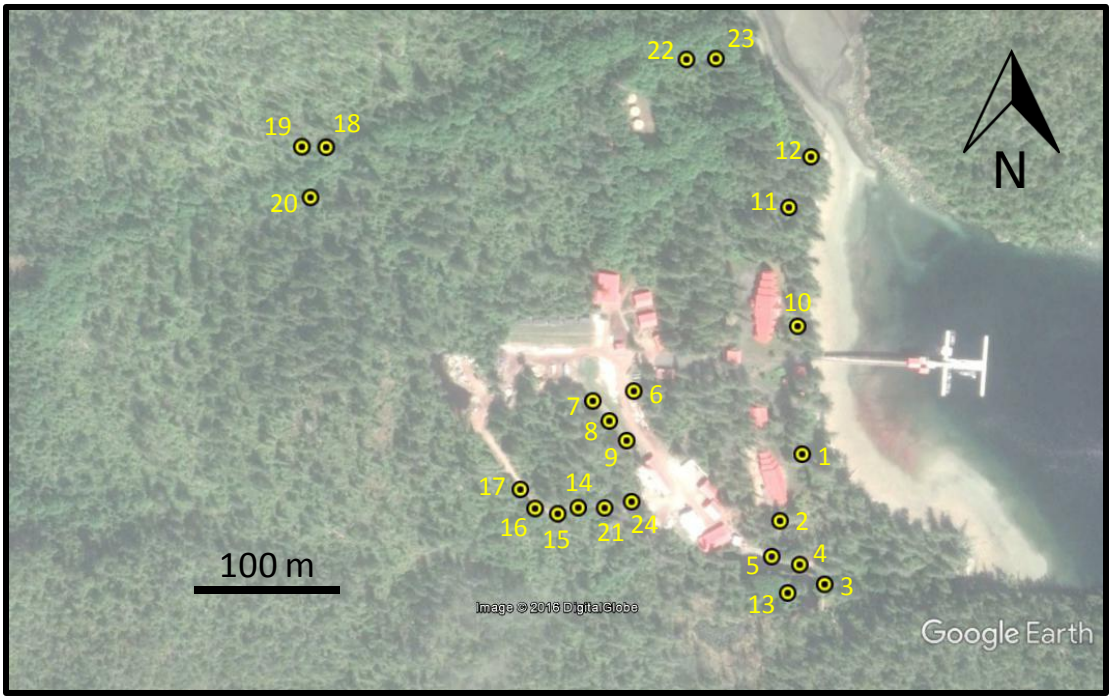

Figure 2. Locations of mist nets at the Calvert Island Field Station. Not all nets were in operation during each banding day. One new net location (net 24) was added in 2016. Table A.1 in Appendix provides details of the specific location of each net.

Each captured bird was extracted from the net and transferred into a cloth bag until further processing at the banding table. The banding process for most birds typically involved the following steps: species identification, band application (if unbanded), age and sex determination, fat score, biometrics (wing chord, tail length, weight), and photography (if applicable). Most birds were processed within about 1-2 minutes and then released. Total handling time from net extraction to release was usually under 30 minutes.

Hummingbirds were not banded due to permit specifications. Instead, to help identify recaptures, a small black or red ink mark was applied on their undertail coverts. Data on age and sex was collected on each hummingbird and all were released near the net shortly after capture.

2.1.2. Incidental Observations

During bird banding days, all birds detected by sight and sound (other than those captured in mist nets) were counted and recorded as incidental observations. These observations were especially important to account for species that were not targeted by mist netting operations (e.g., waterfowl, raptors, etc.). The combination of banding totals (number of birds captured) and incidental observations provided an estimate to the number of species and individuals present at the site.

Banding totals (number of birds captured) and incidental observations were compiled in the online eBird database (ebird.org). eBird is a public database of bird observations providing scientists, researchers and amateur naturalists with real-time data about bird distribution and abundance. The

eBird database can be queried to obtain detailed accounts of species presence / absence and abundance for a given site.

2.2. Results

2.2.1. Songbird Banding

Songbird banding activities were conducted over 10 days from May 5-16, 2016, with a total mist-netting effort of 531 net hours (average 53.1 net hours / day) (Table 1). A total of 161 birds of 18 species were captured in mist nets (Tables A.2 and A.3. in Appendix). Of these, 126 birds were banded and 35 birds were recaptures of previously banded birds. An additional 48 birds were captured and released unbanded. Sample photos are available in Photos A.1 in Appendix.

The overall average capture rate, excluding unbanded birds, was 30.3 birds per 100 net-hours. This was lower than both the June and August 2015 banding periods (42.4 and 35.1 birds per 100 net-hours, respectively). The reduction in capture rate could be partly due to a decrease in net-hours per day of banding (average decrease of 11.7 net-hours per day from 2015). Additional reasons for the decrease may include migratory patterns, weather conditions, seasonal timing of banding efforts, and variation in habitat use.

A total of 18 species were captured and banded in May 2016. This is marginally higher than the August 2015 banding period (17 species), but lower than the June 2015 banding period (22 species). A total of 28 species have been captured over all three banding periods at Calvert Island. Detailed results for the 2015 banding periods are available in Wetten and Demers (2015).

Table 1. Mist net capture statistics at Calvert Island during the 2015 and 2016 banding periods.

Parameter	Value		
	June 2015	**August 2015**	**May 2016**
Capture effort (net-hours)	835	661	**531**
Average daily effort (net-hours / day)	69.5	60.1	**53.1**
Number of birds banded	222	145	**126**
Number of recaptures	132	87	**35**
Total processed	354	232	**161**
Number of unbanded	55	6	**48**
Recapture rate (%)	37.3%	37.5%	**21.7%**
Number of species	22	17	**18**
Capture rate (birds per 100 net-hours)	42.4	35.1	**30.3**

All 48 unbanded birds were Rufous Hummingbirds (*Selasphorus rufus*). Of these, 25 were male and 23 were female. The number of Rufous Hummingbirds caught was slightly lower than for the

June 2015 banding period (55 hummingbirds), but was higher than the number of individuals processed in August 2015 (6 hummingbirds). More hummingbirds were caught during spring of both years, when the species is actively breeding and/or migrating at the site.

Table 2. Capture statistics by mist net at Calvert Island during the May 2016 banding period as well as 2015 and 2016 combined statistics. Capture rate is calculated as birds per 100 net hours.

2016 Totals						2015 and 2016 Combined		
Net Number	**Number Banded**	**Number Recaptured**	**Total Number Captured**	**Net Hours**	**Capture Rate**	**Total Number Captured**	**Net Hours**	**Capture Rate**
1	10	7	17	55.4	30.7	53	178.9	29.6
2	11	10	21	55.4	37.9	62	184.9	33.5
3	5	1	6	55.4	10.8	35	161.2	21.7
4	11	2	13	55.4	23.5	54	184.9	29.2
5	27	5	32	55.4	57.8	101	184.9	54.6
6	1	0	1	1.0	100.0	83	47.8	173.6
7	0	0	0	0.0	0.0	34	95.3	35.7
8	0	0	0	0.0	0.0	18	94.0	19.1
9	0	0	0	0.0	0.0	44	85.6	51.4
10	0	0	0	0.0	0.0	11	54.0	20.4
11	0	0	0	0.0	0.0	8	54.0	14.8
12	0	0	0	0.0	0.0	25	54.0	46.3
13	0	0	0	0.0	0.0	10	30.7	32.6
14	15	3	18	49.4	36.4	63	136.9	46.0
15	7	2	9	49.4	18.2	33	130.2	25.3
16	0	0	0	0.0	0.0	6	45.8	13.1
17	0	0	0	0.0	0.0	16	35.3	45.3
18	0	0	0	0.0	0.0	4	23.7	16.9
19	3	1	4	13.5	29.6	15	37.2	40.3
20	1	0	1	13.5	7.4	9	37.2	24.2
21	18	1	19	49.4	38.5	42	80.6	52.1
22	1	0	1	11.5	8.7	1	17.0	5.9
23	1	0	1	12.5	8.0	2	18.0	11.1
24	15	3	18	55.4	32.5	18	55.4	32.5
Totals	**126**	**35**	**161**	**532.6**	**30.2**	**731**	**2,027.5**	**36.8**

The capture rate of individual nets varied across the project site in 2016 (Table 2). The top five nets with the highest capture rates in 2016 were net 5, net 2, net 14, net 21 and net 1, respectively. Nets 5 and 14 were the only nets to be in the top five in both 2015 and 2016. Net 5 has captured the most individuals (101 birds; 14%) during both years.

Overall, Orange-crowned Warbler (*Oreothlypis celata*) was the most captured species in 2016 (59 individuals; 36.6% of all birds processed), with over twice as many individuals caught compared to any other species (Table 3). Yellow Warbler (*Setophaga petechia*) was the next most common species and accounted for 17.4% of all birds captured.

Table 3. Ten most common species captured in mist nets at Calvert Island during the May 2016 banding period.

Common Name	Number Banded	Number Recaptured	Total
Orange-crowned Warbler	46	13	59
Yellow Warbler	27	1	28
Wilson's Warbler	18	0	18
Song Sparrow	1	9	10
Golden-crowned Sparrow	7	1	8
Pacific Wren	3	3	6
American Robin	3	3	6
Fox Sparrow	2	4	6
Hermit Thrush	5	0	5
Townsend's Warbler	4	0	4

Table 4. Top five most captured species in mist nets at Calvert Island during the June 2015, August 2015, and May 2016 banding periods.

Rank	June 2015	August 2015	May 2016
1	Orange-crowned Warbler	Dark-eyed Junco	Orange-crowned Warbler
2	Dark-eyed Junco	Golden-crowned Kinglet	Yellow Warbler
3	Golden-crowned Kinglet	Pacific Wren	Wilson's Warbler
4	Song Sparrow	Orange-crowned Warbler	Song Sparrow
5	American Robin	Song Sparrow	Golden-crowned Sparrow

The top five species for the May 2016 banding period differed from the 2015 banding periods (Table 4). Similar to June 2015, the top species in May 2016 was Orange-crowned Warbler. Three new species made it into the top five list in 2016, including Yellow Warbler, Wilson's Warbler

(*Cardellina pusilla*), and Golden-crowned Sparrow (*Zonotrichia atricapilla*). No Golden-crowned Kinglet (*Regulus satrapa*) or Hairy Woodpecker (*Leuconotopicus villosus*) were captured in 2016, even though these species were captured in 2015. Differences in species ranking reflected the different timing of mist netting activities between years, and between- and within-year variation in abundance.

The age composition of birds captured varied between each banding period (Table 5) and reflected the timing of banding activities in relation with the timing of the annual moult that occurs after the breeding season as well as the recruitment of young birds (hatch-year birds) to the population. Most species had not yet started to breed when banding was conducted in 2016, which accounts for the lack of hatch-year birds. Second-year and after-second-year birds were dominant (92.5% of banded birds) during the May 2016 banding period.

Table 5. Age structure of birds banded at Calvert Island during the June 2015, August 2015, and May 2016 banding periods.

Banding Period	Hatch Year (HY)	Second Year (SY)	After Hatch Year (AHY)	After Second Year (ASY)	Other Ages (TY, ATY)	Total
June 2015	95	76	9	39	3	222
August 2015	132	2	9	1	0	144
May 2016	0	59	8	59	0	161
TOTAL	227	148	31	119	3	527

Birds store fat as a readily accessible source of energy, especially during migration. Overall, half of the birds banded in 2016 (50.0%) did not display any visible fat (fat score = 0) (Table 6). Of the birds displaying fat (63 individuals), a slightly larger proportion (61.9%) were carrying only small amounts (fat score = 1 or 2). Over all three banding periods, most birds banded did not show any fat (53.5%) and only a very small percentage (11.0%) showed high amounts of fat.

Table 6. Fat scores measured from birds banded at Calvert Island during the June 2015, August 2015, and May 2016 banding periods. Fat scores are determined by examination of the furcular hollow on the upper breast. Fat scores: 0 = 0%, no fat; 1 = 1-5% fat as scattered patches; 2 = 5-33% fat as a thin layer; 3 = 33-66% fat half-filling the furcular hollow; 4 = 66-100% fat filling the furcular hollow; 5 = >100% fat bulging from the furcular hollow.

Banding Period	0	1-2	3-5	Total
June 2015	140	61	19	220
August 2015	59	74	11	144
May 2016	63	39	24	126
TOTAL	262	174	54	490

A total of 35 recapture events were recorded during the May 2016 banding period (Table 1). Recaptures made up 21.7% of total birds captured, which was lower than both the June and August 2015 banding periods (37.3% and 37.7%, respectively). Most recapture events (37.1%) involved birds that were recaptured only once. However, 9 individuals were captured more than once, and 2 individuals were recaptured at least 4 times (Table 7). Five of these individuals were originally captured in June 2015. American Robin (*Turdus migratorius*) and Song Sparrow (*Melospiza melodia*) are year-round resident at Calvert Island, whereas Orange-crowned Warbler migrate to the southern USA or Central America to overwinter. These data indicate site fidelity between years for these individuals.

Table 7. List of selected individuals recaptured two or more times at Calvert Island during the May 2016 banding period. AMRO = American Robin, SOSP = Song Sparrow, OCWA = Orange-crowned Warbler, FOSP = Fox Sparrow. Refer to Table 5 for age codes. Sex codes: F = Female; M = Male.

Band Number	Species	Age	Sex	Number of Times Recaptured Since Banded	Date Banded	Date of Last Recapture
1352-50138	AMRO	ASY	M	5	11 June 2015	7 May 2016
2531-28504	FOSP	SY	M	4	7 May 2016	13 May 2016
2691-51187	SOSP	ASY	M	7	11 June 2015	15 May 2016
2691-51192	SOSP	SY	F	8	12 June 2015	7 May 2016
2730-48145	OCWA	SY	M	2	17 June 2015	15 May 2016
2730-48167	OCWA	SY	M	4	20 June 2015	8 May 2016
2780-62045	OCWA	SY	M	2	6 May 2016	9 May 2016
2780-62046	OCWA	ASY	F	2	6 May 2016	9 May 2016
2780-62055	OCWA	SY	M	2	9 May 2016	16 May 2016

Of the 366 birds banded in 2015, only 11 individuals were recaptured in 2016. These individuals were of four species: Song Sparrow (4), Orange-crowned Warbler (4), Pacific Wren (2) and American Robin (1). Most of these individuals were originally banded in June 2015.

The following list highlights a few interesting species-specific results of the bird banding activities conducted in May 2016:

- Warbling Vireo (*Vireo gilvus*): This was a new species for the Calvert Island bird banding project with one after-second-year individual captured. The species has been observed in the area previously but not during either of the 2015 banding periods.

- Golden-crowned Sparrow: Seven individuals were captured during May 2016, a new species for the Calvert Island bird banding project. They had been observed in the area during previous banding activities in 2015.

- Pine Siskin (*Spinus pinus*): One after-second-year male was captured during the May 2016 banding period. This was a new species for the Calvert Island bird banding project. They had been observed in the area previously.

- Yellow Warbler: Twenty-seven individuals were captured with 14 of those individuals (51.2 %) caught on the same day (12 May 2016). No other Yellow Warblers were caught before this date during the banding period. The majority of these individuals were males (88.9 %) and, of these, most were after-second-year birds (66.7 %). Older males are usually the first to migrate to their breeding grounds, which suggests that this may have been the beginning of the species' migration through Calvert Island. This is further supported by elevated fat scores in six of the individuals. Also, one individual who, when first banded, had a low fat score (fat score = 1), exhibited an increase in fat storage when later recaptured (fat score = 3). This suggests that they were likely stopping at Calvert Island to replenish their fat stores before continuing their migration.

- Belted Kingfisher: One second-year individual was captured and banded in May 2016. This individual was caught in net 5, which is where the three other Belted Kingfishers were caught during the August 2015 banding period. This net was positioned on the Tsunami pathway between the water retention ponds (Figure 2), which appears to be in a flight pathway for Belted Kingfishers.

2.2.2. Overall Species Presence / Absence

A total of 43 species were observed at the Calvert Island Field Station during May 2016, and 37.2% of the species observed were captured in mist nets (Table A.4 in Appendix). It is important to note that many of the species recorded during incidental observations (e.g., loons, herons) are not expected to be captured in mist nets which are mostly designed to capture songbirds.

At least one individual of most of the passerine (songbirds) and near passerine species observed at the Calvert Island Field Station were captured in mist nets. Notable exceptions included: Northern Flicker (*Colaptes auratus*), Downy Woodpecker (*Picoides pubescens*), and Red Crossbill (*Loxia curvirostra*). Sightings of less commonly recorded species in May 2016 included two American Wigeon (*Anas americana*) and one Sooty Grouse (*Dendragapus fuliginosus*).

3. Discussion and Assessment

The objectives of this project were to (a) monitor resident and migratory birds on Calvert Island, and (b) assess the suitability for the establishment of a long-term migration station.

With only short periods of banding, it is difficult to fully assess migratory potential of an area. It is easy to miss large flocks of migratory birds during the long spring (April-June) and fall (August-October) migration periods. Based on the banding data and incidental observations, spring migration and the breeding season may have just been starting during the May 2016 banding period. The absence of fat on most individuals, the absence of breeding characteristics, and the higher numbers of older (after-hatch-year) birds support this claim. The increase in capture rate

observed over one day (12 May 2016) may have been an example of a migratory pulse passing through Calvert Island. Further bird banding efforts during spring migration may help to assess the migratory potential of this area.

Future banding and monitoring efforts could focus primarily on the spring migration period and the onset of the breeding season, namely most of the month of May. Conducting mist netting for a longer period (i.e., 4 weeks) would aid in determining the timing and extent of spring migration on Calvert Island. Any banding done could also serve as a temporal reference to supplement the research efforts of the 100 Islands project.

Since the number of Rufous Hummingbirds captured during spring is high, a project focused on the banding of this species could be beneficial in providing a more accurate estimate of their population size and dynamics on Calvert Island.

4. Public Demonstrations and Education

Public demonstrations and education were also conducted during this project. This was achieved through informal public presentations about the project, through guided on-site visits by individual visitors and groups.

During the May 2016 banding period, no scheduled public demonstrations were conducted. Often Hakai staff and fellow researchers would visit the station to learn more about banding and handling birds, as well as avian ecology in the area. Also, any interested visitors to Calvert Island were provided knowledge and demonstrations on banding procedures. The project received numerous visits each day. About 20-30 visitations were recorded during the 10 days of banding in May.

5. Social Media Outreach

Social media played a large part in public outreach and education of this project. Wordpress blogs were maintained regularly by banders during each banding period. This allowed online followers to not only learn about the project, but to also gain insight on banding procedures, species identification, bird behaviour, and more. The blogs can be found at the following links:

- May 2016: https://bandingatcalvert.wordpress.com
- August 2015: http://calvertislandbanding.wordpress.com
- June 2015: http://wordpress.viu.ca/bandingatcalvert

Statistics produced by Wordpress showed that the 2016 blog was viewed over 615 times by individuals from Canada, USA, UK, South Africa, New Zealand, and the U.S. Virgin Islands. Referrers (websites that post a link to the blog) included Facebook, Google Search, Twitter, Hakai.org, and Wordpress Dashboard. Several blog entries were posted on Facebook via the VIU Bird Banding Station and the banding staff's personal pages. The Hakai Institute also aided in the social outreach portion of this project. Blog information was posted to Hakai.org for each banding period.

6. Acknowledgements

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Thanks to the Calvert Island Field Station staff, the 100 Islands Project team members (special thanks to the bird team), and fellow Hakai researchers for the various avenues of support provided to the project and the project team members.

Special thanks to the bird banders who conducted the field work for this project, including getting up before sunrise each day. Banders for the 2016 project were Sarah Chalmers (Bander-in-Charge), Sharlene James, and Kim Wetten (Bander-in-Charge). Previous banders on the project included Dr. Eric Demers (Bander-in-Charge) and Elsie Hampshire.

The Tula Foundation, Vancouver Island University and the VIU Work-Opportunities program are acknowledged for their financial support of this project.

Bird banding activities were conducted in accordance with Vancouver Island University Animal Use Protocol No. 2012-10-R, and in accordance with Canadian Wildlife Service Bird Banding Office Scientific Permit No. 10885 (Eric Demers), 10885A (Kimberley Wetten) and 10788H (Sarah Chalmers) to capture and band migratory birds, including authorization to use mist nets for the capture of passerines and other landbirds.

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7. Appendix

Table A.1. Geographic coordinates (UTM) of the mist-netting locations and effort (net-hours) used at Calvert Island during the June 2015, August 2015, and May 2016 banding periods. All easting and northing coordinates are based on zone 9U.

Net Location	UTM Coordinates		Net Hours		
	Easting	Northing	June 2015	August 2015	May 2016
1	560150	5722909	65.3	58.2	55.4
2	560140	5722864	65.3	64.2	55.4
3	560174	5722827	41.7	64.2	55.4
4	560156	5722837	65.3	64.2	55.4
5	560138	5722841	65.3	64.2	55.4
6	560036	5722936	36.7	10.2	1.0
7	560011	5722926	65.3	30.0	0.0
8	560023	5722915	41.7	50.3	0.0
9	560036	5722904	65.3	20.3	0.0
10	560138	5722991	30.0	24.0	0.0
11	560123	5723067	30.0	24.0	0.0
12	560134	5723102	30.0	24.0	0.0
13	560151	5722818	30.7	0	0.0
14	560009	5722857	35.3	52.2	49.4
15	559997	5722851	28.7	52.2	49.4
16	559982	5722853	11.7	34.2	0.0
17	559971	5722864	35.3	0	0.0
18	559820	5723069	23.7	0	0.0
19	559805	5723067	23.7	0	13.5
20	559813	5723036	23.7	0	13.5
21	560027	5722859	19.8	11.3	49.4
22	560045	5723154	0	5.5	11.5
23	560064	5723157	0	5.5	12.5
24	560044	5722865	0	0	55.4

Table A.2. List of all species captured in mist nets at Calvert Island during the May 2016 banding period. Subspecies are included in parentheses where applicable.

Common Name	Number banded	Number recaptured	Total number captured
Orange-crowned Warbler	46	13	59
Yellow Warbler	27	1	28
Wilson's Warbler	18		18
Song Sparrow	1	9	10
Golden-crowned Sparrow	7	1	8
Pacific Wren	3	3	6
American Robin	3	3	6
Fox Sparrow	2	4	6
Hermit Thrush	5		5
Townsend's Warbler	4		4
Pacific-slope Flycatcher	2		2
Dark-eyed Junco (Oregon)	2		2
Chestnut-backed Chickadee	1	1	2
Belted Kingfisher	1		1
Warbling Vireo	1		1
Steller's Jay	1		1
Swainson's Thrush	1		1
Pine Siskin	1		1
TOTAL	126	35	161

Table A.3. Number of all species captured during each day of mist netting at Calvert Island during the May 2016 banding period. Subspecies are included in parentheses where applicable.

Date	Belted Kingfisher	Pacific-slope Flycatcher	Warbling Vireo	Steller's Jay	Chestnut-backed Chickadee	Pacific Wren	Swainson's Thrush	Hermit Thrush	American Robin	Orange-crowned Warbler	Yellow Warbler	Townsend's Warbler	Wilson's Warbler	Fox Sparrow	Dark-eyed Junco (Oregon)	Golden-crowned Sparrow	Song Sparrow	Pine Siskin	Total
6-May						1			1	4				1		1	2		10
7-May	1					1			1	3			1	1	1		2		11
8-May				1					1	7			1	1		1			12
9-May						1		2		12			1	1				1	18
10-May					1					2		1	1	1		1			7
11-May					1					5							2		8
12-May								3	2	16	14	2	5			5	1		48
13-May		2	1			1	1			6	7	1	4	1	1		1		26
15-May						2			1	2	5		3				2		15
16-May										2	2		2						6
	1	2	1	1	2	6	1	5	6	59	28	4	18	6	2	8	10	1	161

Table A.4. List of all species observed at Calvert Island during the May 2016 banding period based on a combination of banding totals and incidental observations. Green rectangles indicate that a species was observed during a given time period. Areas in gray checkerboard indicate that no data are available. The size of the green rectangles represents the proportion of surveys for which a species was detected. Data compiled in and extracted from eBird database.

Photos A.1. Sample photographs for the Calvert Island banding project during the May 2016. Photos were used for training / teaching purposes of banders as well as public education. Photos courtesy of S. Chalmers, S. James, and K. Wetten.


Warbling Vireo


Orange-crowned Warbler


Wilson's Warbler


Belted Kingfisher


Golden-crowned Sparrow


Townsend's Warbler

Photos A.1. (continued)


Rufous Hummingbird


Brown-headed Cowbirds


Pacific-slope Flycatcher


Hermit Thrush


Fox Sparrow


Eurasian Collared-dove