DATA REPORT

Pilot Bird Banding Project at the

Calvert Island Field Station 2015


Belted Kingfisher

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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.

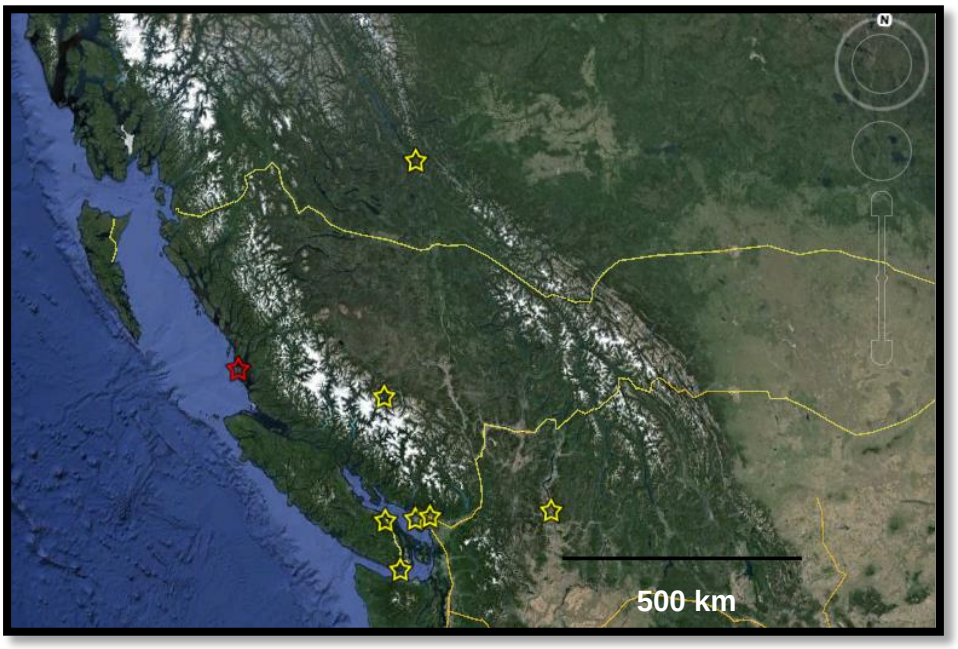

Figure 1. Aerial photograph of British Columbia showing currently established bird banding stations (yellow stars) and the Calvert Island pilot site (red star). Image courtesy of Google Earth © 2015.

Calvert Island, which is situated approximately 100 km north of Port Hardy on the BC Central Coast, has the potential for being an important stop-over site for migratory birds using the Pacific flyway. In 2015, Vancouver Island University conducted a pilot banding project on Calvert Island 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 pilot bird banding project conducted on Calvert Island in 2015. 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. Songbird 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 and No. 10885A, and following procedures and guidance established in the VIU Bird Monitoring and Banding Manual (Demers, 2012), the North American Banding Council (NABC, 2001a,b), and the Institute for Bird Populations (IBP, 2012).

During the time periods of June 11-22, 2015 and August 12-24, 2015, twenty-three mist net locations were established around the Calvert Island Field Station (Figure 2; Table A.1 in Appendix). Thirteen nets were installed and rotated in stages among locations, and not all 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 11 days during both time periods. 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. 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 22 days (11 days / period) between June 11-22 and August 12-24, 2015, with a total mist netting effort of 1,405 net hours (average: 63.9 net hours / day) (Table 1). A total of 646 birds of 25 species were captured in mist nets (Table A.2. and Table A.3. in Appendix). Of these, 366 birds were banded and 219 birds were recaptures of previously banded birds. An additional 61 birds were captured and released unbanded. The overall average capture rate was 46.0 birds / 100 net-hours for all birds captured, and 41.6 birds / 100 net-hours for all birds processed (excluding unbanded birds).

During the June 2015 banding period, 354 birds were processed with a capture rate of 47.6 birds per 100 net-hours. Fewer birds (231 birds) were processed during the August 2015 banding period with a reduction in capture rate to 34.9 birds per 100 net-hours. This reduction in both birds processed and capture rate was partly due to a reduction in net-hours per day (average decrease of 7.5 net-hours per day) mainly due to inclement weather. Additional reasons for the decrease in catch rate may include variation in habitat use, post-natal dispersal, and migratory patterns. The total number of species captured was also higher in June (22 species) than in August (17 species).

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

Parameter	Value		
	June	**August**	**Total**
Capture effort (net-hours)	744	661	**1,405**
Average daily effort (net-hours / day)	67.6	60.1	**63.9**
Number of birds banded	222	144	**366**
Number of recaptures	132	87	**219**
Total processed	354	231	**585**
Number of unbanded	55	6	**61**
Recapture rate (%)	37.2%	37.7%	**37.4%**
Number of species	22	17	**25**
Capture rate (birds per 100 net-hours)	47.6	34.9	**41.6**

All 61 unbanded birds were Rufous Hummingbird (*Selasphorus rufus*). Most of the hummingbird captures occurred in June (55 hummingbirds), whereas only 6 individuals were processed in August. Of the hummingbirds captured in June, 28 were males, 26 were females and one was a newly fledged bird of unknown sex. Using a simple multiple-census mark-recapture method, the local population of Rufous Hummingbird at the Calvert Island Field Station was estimated at 348 birds (95% CI: 118-1,044 birds) during the June banding period.

The capture rate of individual mist nets varied across the project site (Table 2). The top five nets with the highest capture rates were net 6, net 21, net 5, net 14 and net 19, respectively. Note that net 6 had not only the highest capture rate, but also a heightened number and percentage of recaptured birds. This was likely abnormally inflated due to the net's close proximity to the composting facility, a food source for many species.

Table 2. Capture statistics by mist net at Calvert Island during the June and August 2015 banding periods.

Net Number	Number Banded	Number Recaptured	Total Number Captured	Net Hours	Capture Rate (Birds / 100 Net hours)
1	24	12	36	123.5	29.1
2	30	11	41	129.5	31.7
3	19	10	29	105.8	27.4
4	32	9	41	129.5	31.7
5	44	25	69	129.5	53.3
6	41	41	82	46.8	175.2
7	18	16	34	95.3	35.7
8	13	3	18	94.0	19.1
9	27	17	44	85.6	51.4
10	8	3	11	54.0	20.4
11	4	4	8	54.0	14.8
12	19	5	25	54.0	46.3
13	7	3	10	30.7	32.6
14	23	22	45	87.5	51.4
15	20	4	24	80.8	29.7
16	3	3	6	45.8	13.1
17	6	10	16	35.3	45.3
18	1	3	4	23.7	16.9
19	10	1	11	23.7	46.4
20	5	3	8	23.7	33.8
21	12	11	23	31.2	73.7
22	0	0	0	5.5	0.0
23	0	1	1	5.5	18.2
Totals	366	219	585	1,405	41.6

Overall, Orange-crowned Warbler (*Oreothlypis celata*) and Dark-eyed Junco (*Junco hyemalis*) were the most captured species (127 individuals each) and, together, they represented 43.4% of all birds caught (Table 3). However, more Orange-crowned Warbler were banded (81) compared to

Dark-eyed Juncos (60), but the latter were recaptured more often (52.7% vs. 36.2% of birds caught, respectively). Golden-crowned Kinglet (*Regulus satrapa*) was the next most common species and accounted for 15.6% of all birds caught. All species listed in Table 3 are local breeders at Calvert Island. Tables A.2 and A.3 in the Appendix provide a complete summary of all species captured during both banding periods. Photographs of some of the species captured are shown in Appendix B.1. The raw banding data are also provided at the end of this report.

Table 3. Ten most common species captured in mist nets at Calvert Island during the June and August 2015 banding periods.

Common Name	June 2015		August 2015		Total Number Captured
	Number Banded	Number Recaptured	Number Banded	Number Recaptured	
Orange-crowned Warbler	66	35	15	11	127
Dark-eyed Junco (Oregon)	33	33	27	34	127
Golden-crowned Kinglet	40	15	24	12	91
Song Sparrow	12	23	8	9	52
Pacific Wren	11	3	19	13	46
American Robin	13	14	11	0	38
Steller's Jay	8	4	3	1	16
Pacific-slope Flycatcher	7	1	6	0	14
Wilson's Warbler	3	2	4	4	13
Yellow Warbler	8	0	5	0	13

The top ten species stayed the same for each period, although the ranking for each species changed (Table 4). For instance, Orange-crowned Warbler was the most caught species in June, but was the fourth most caught in August. Also, Pacific Wren (*Troglodytes pacificus*) was the sixth most captured species in June, but was the third most captured in August.

Table 4. Number captured and rank (in parentheses) of the ten species most captured in mist nets at Calvert Island during the June and August 2015 banding periods.

Common Name	June 2015	August 2015
Orange-crowned Warbler	101 (1)	26 (4)
Dark-eyed Junco (Oregon)	66 (2)	61 (1)
Golden-crowned Kinglet	55 (3)	36 (2)
Song Sparrow	35 (4)	17 (5)
American Robin	27 (5)	11 (6)
Pacific Wren	14 (6)	32 (3)
Steller's Jay	12 (7)	4 (12)
Pacific-slope Flycatcher	8 (8)	6 (10)
Yellow Warbler	8 (8)	5 (11)
Wilson's Warbler	5 (10)	8 (8)

Some species were only captured during one sampling period. Species caught in June but not in August included: Eurasian Collared-dove (*Streptopelia decaocto*), Hairy Woodpecker (*Picoides villosus*), Common Raven (*Corvus corax*), Chestnut-backed Chickadee (*Poecile rufescens*), Hermit Thrush (*Catharus guttatus*), Varied Thrush (*Ixoreus naevius*), Gray Catbird (*Dumetella carolinensis*), Cedar Waxwing (*Bombycilla cedrorum*), and Yellow-rumped Warbler (Audubon's) (*Setophaga coronate*). Species caught in August but not caught in June included: Belted Kingfisher (*Megaceryle alcyon*), Brown Creeper (*Certhia americana*), and Townsend's Warbler (*Setophaga townsendi*).

The age composition of birds captured varied between seasons and reflected the recruitment of young birds (hatch-year birds) to the population and changes in age assignment associated with the annual moult that occurs after the breeding season (Table 5). Hatch-year birds were dominant during both banding periods, but the percentage increased from 42.8% of total banded birds in June to 91.7% in August.

Table 5. Age structure of birds banded at Calvert Island during the June and August 2015 banding periods. Age codes: HY = born in 2015; SY = born in 2014; AHY = born in 2014 or earlier; ASY = born in 2013 or earlier; TY = born in 2013; ATY = born in 2012 or earlier.

Period	Hatch Year (HY)	Second Year (SY)	After Hatch Year (AHY)	After Second Year (ASY)	Other Ages (TY, ATY)	Total
June	95	76	9	39	3	222
August	132	2	9	1	0	144
TOTAL	227	78	18	40	3	366

Birds store fat as a readily accessible source of energy, especially during migration. Overall, the majority of birds banded (54.7%) did not display any visible fat (fat score = 0). A larger proportion of birds showed some fat in August (59.0%) compared to in June (36.4%).

Table 6. Fat scores measured from birds banded at Calvert Island during the June and August 2015 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-fulling the furcular hollow; 4 = 66-100% fat fulling the furcular hollow; 5 = >100% fat bulging from the furcular hollow.

Month	0	1-2	3-5	Total
June	140	61	19	220
August	59	74	11	144
TOTAL	199	135	30	364

A total of 219 recapture events were recorded during this project, with 132 recaptures in June and 87 recaptures in August. Although there was a reduction in the number of recaptures between June and August 2015, the recapture rate remained nearly constant (37.2% and 37.7%, respectively). Of the 366 individuals banded, 131 (35.8%) were recaptured at some point during either banding period. Most recapture events (34.4%) involved birds that were recaptured only once. However, 57 individuals were captured more than once, and 6 individuals were recaptured at least 4 times. The most frequently recaptured individuals are listed in Table 7.

Table 7. List of selected individuals recaptured three or more times at Calvert Island during the June and August 2015 banding periods. AMRO = American Robin, ORJU = Dark-eyed Junco (Oregon), SOSP = Song Sparrow, OCWA = Orange-crowned Warbler. Refer to Table 5 for age codes. Sex codes: F = Female; M = Male; U = Unknown.

Band Number	Species	Age	Sex	Number of Times Recaptured Since Banded	Date Banded	Date of Last Recapture
1352-50137	AMRO	ASY	F	4	11 June	20 June
2621-82401	ORJU	HY	U	6	12 August	21 August
2691-51189	SOSP	HY	U	4	11 June	22 June
2691-51192	SOSP	SY	F	6	12 June	15 August
2730-48083	ORJU	ASY	M	4	11 June	12 August
2730-48106	OCWA	ASY	F	4	13 June	21 June

A species-based recapture rate of at least 1 in 5 birds (i.e., ≥20%) was observed in 9 of the 24 species captured. Wilson's Warbler (*Cardellina pusilla*) exhibited the highest recapture rate

(71.4%), followed by Song Sparrow (*Melospiza melodia*) (70.0%), Fox Sparrow (*Passerella iliaca*) (66.0%), and Dark-eyed Junco (53.3%).

Of the 222 birds banded in June 2015, only 18 individuals (8.1%) were recaptured in August 2015. These individuals were of five species: Dark-eyed Junco (8), Orange-crowned Warbler (4), Golden-crowned Kinglet (3), Song Sparrow (2), and Pacific Wren (1).

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

- Eurasian Collared-dove: This species was introduced to the Bahamas in the 1970's, made its way to Florida by the 1980's, and then rapidly colonized most of North America. The few individuals at Calvert Island were often observed foraging near the composting facility.

- Belted Kingfisher: Three hatch-year individuals were captured and banded in August 2015. All were caught in net 5, which was positioned on the Tsunami pathway between the water retention ponds (Figure 2).

- Common Raven: This species is rarely caught in mist nets due to its cautious nature and high level of intelligence. A hatch-year individual was captured during June 2015. This individual was re-sighted repeatedly by staff at the Calvert Island Field Station during summer 2015.

- Gray Catbird: A single individual of this species was captured during June 2015. This species is rare on the BC central coast, and the nearest confirmed breeding recorded as part of the most recent BC Breeding Bird Atlas (Davidson et al., 2015) was near Williams Lake. A single individual had previously been observed at the Calvert Island Field Station during June 2014 (B. Starzomski, pers. obs.; eBird, 2012). It is possible that the individual captured in 2015 was the same individual observed in 2014.

- Yellow Warbler: Eight individuals were captured during June 2015 and, unlike most other species captured, none of the birds caught exhibited signs of any breeding characteristics (either a brood patch (female) or cloacal protuberance (male)). In addition, five individuals displayed elevated fat storage (fat score: 3-4 out of 5). This suggests that most of the Yellow Warblers captured may have been recent arrivals or birds that were still on their northward migration.

- Fox Sparrow: A single individual of this species was captured during June 2015 (band number 2561-31666). This banded individual was re-sighted repeatedly around the Calvert Island Field Station after banding. Interestingly, this individual was seen and heard vocalizing songs that mimicked Swainson's Thrush and Song Sparrow. Further details are provided on the June 2015 blog (see link below).

- Song Sparrow: Two different subspecies of Song Sparrow were banded (subspecies *rufina* and subspecies *kenaiensis*). Subspecies identification based on photographs was confirmed by Peter Pyle of the Institute for Bird Populations. Research indicates that subspecies *kenaiensis* normally breeds in south-central Alaska (Pyle 1997; Patten et al. 2009). During

the banding periods, a female with a brood patch and multiple juveniles were banded, possibly indicating a local breeding population.

2.2.2. Overall Species Presence / Absence

Banding totals (number of birds captured) and incidental observations were compiled in the online eBird database (eBird, 2012). 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 at a specific time period.

A total of 64 species were observed at the Calvert Island Field Station during the June and August 2015 banding periods (Table A.4. in Appendix). In June, 40.7% of all species observed during that banding period were captured in mist nets, while this percentage decreased to 35.4% in August. It is important to note that many of the species recorded during incidental observations (e.g., loons, herons) are unexpected to be captured in mist nets 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 during the June and August 2015 banding periods was captured in mist nets. Notable exceptions included: Northern Flicker (*Colaptes auratus*), Barn Swallow (*Hirundo rustica*), Ruby-crowned Kinglet (*Regulus calendula*), Golden-crowned Sparrow (*Zonotrichia atricapilla*), and Red Crossbill (*Loxia curvirostra*).

The following list highlights an interesting species-specific results from the observations made during bird banding activities:

- Northern Mockingbird (*Mimus polyglottos*): A single individual of this species was observed for two days in June 2015. This bird was not captured even though it was observed near the mist nets. This species is rare on the BC central coast, and there was no confirmed breeding recorded in BC as part of the most recent BC Breeding Bird Atlas (Davidson et al., 2015). Like the Gray Catbird, a single individual had previously been observed at the Calvert Island Field Station during June 2014 (B. Starzomski, pers. obs.; eBird, 2012). It is possible that the individual observed in 2015 was the same individual observed in 2014.

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 banding periods, 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, breeding was well underway in June and it continued during August. The presence of breeding characteristics and absence of fat on many individuals, the high overall recapture rate (37.4%), and the high

number of birds in juvenal plumage all support this claim. Therefore, peaks in spring and fall migration likely occurred earlier and later, respectively, than the project dates available during 2015.

The reduction in capture rate between the June and August banding periods was somewhat unexpected since observations at most bird banding stations indicate higher catch rates during August-September mainly due to the new recruitment of dispersing hatch-year birds. This result could suggest that the local abundance of some species may decline due to early post-breeding dispersal or early onset of migration away from the area. The low proportion of non-Hatch-Year birds captured in August (8.3%) may indicate that older birds disperse or migrate away early after breeding. The contribution of Calvert Island as a migratory stopover may also differ between spring and fall migration. Further explanation of these trends remains speculative and subject to observations and data limited to brief periods within a single year.

Future banding and monitoring efforts could focus primarily on the spring migration period and the onset of the breeding season, namely between the last week of April and the end of May (i.e., roughly April 20 to May 31). Higher capture rates during the June banding period indirectly suggest that capture rates could also be higher during this period. In addition, conducting mist netting earlier would help avoid potential impacts of banding activities on actively breeding birds and their young. Spring migration banding at Calvert Island could also serve as a temporal reference to supplement the research efforts of the 100 Islands project.

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, both planned and unplanned.

Two banding demonstrations were scheduled in June 2015 for school groups in the local area. During the August 2015 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 40-60 visitations were recorded during each banding period.

5. Social Media Outreach

Social media played a large part in public outreach and education of this project. Two Wordpress blogs were maintained regularly by banders during each of the June and August 2015 banding periods. 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:

June 2015	August 2015
http://wordpress.viu.ca/bandingatcalvert/	http://calvertislandbanding.wordpress.com/

Statistics produced by Wordpress showed that the blogs were viewed over 630 times by individuals all over the world, including Canada, USA, UK, and Netherlands. 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. Hakai Institute staff also produced a short video called "Pacific Flyway", which highlighted the banding process as well as the research conducted via the project (http://www.hakai.org/videos/mini-documentaries).

6. Acknowledgements

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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) and 10885A (Kimberley Wetten) to capture and band migratory birds, including authorization to use mist nets for the capture of passerines and other landbirds.

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8. Appendix

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

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

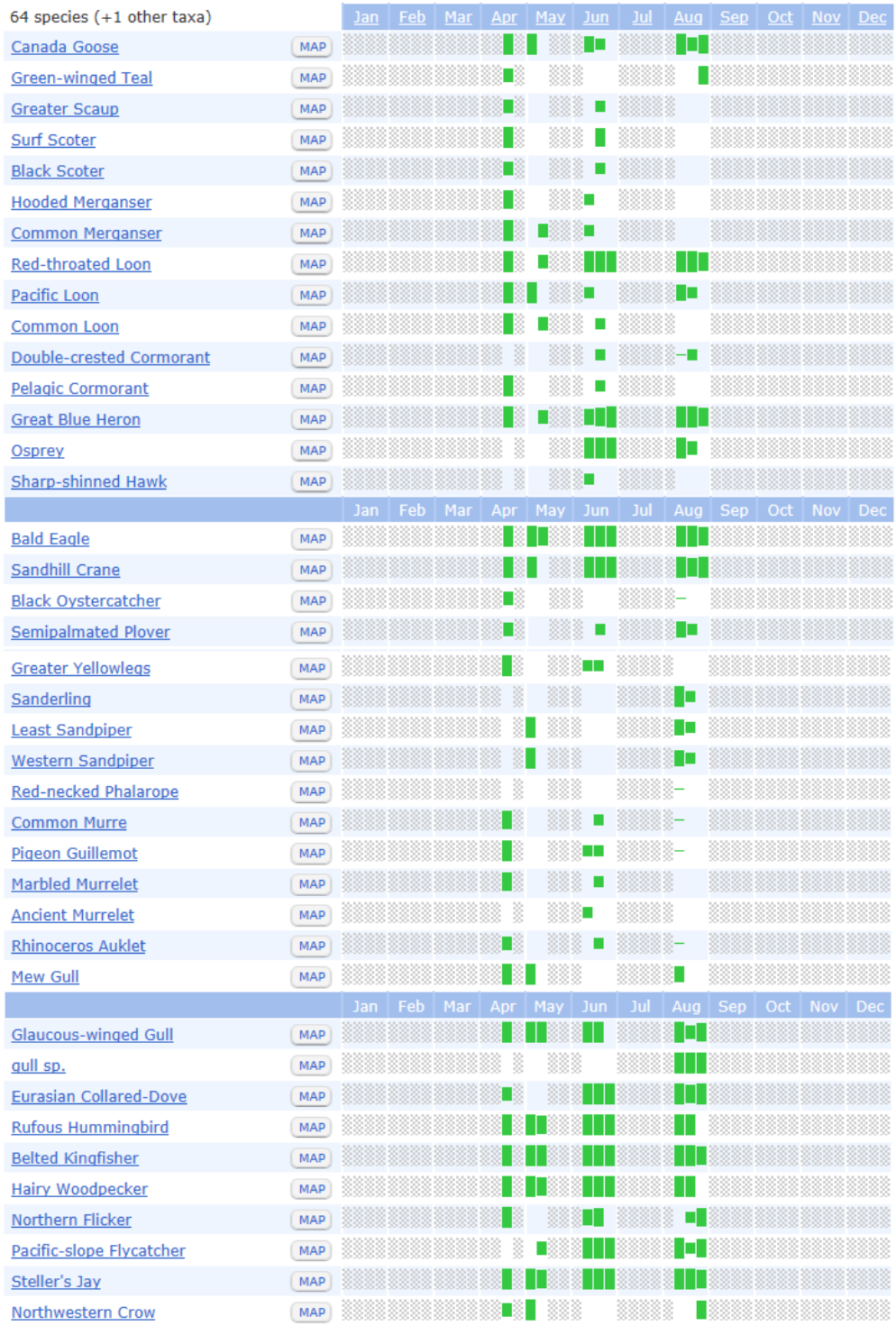
Table A.2. List of all species captured in mist nets at Calvert Island during the June and August 2015 banding periods. Subspecies are included in parentheses where applicable.

Common Name	Number banded	Number recaptured	Total number captured
Orange-crowned Warbler	81	46	127
Dark-eyed Junco (Oregon)	60	67	127
Golden-crowned Kinglet	64	27	91
Song Sparrow	20	32	52
Pacific Wren	30	16	46
American Robin	24	14	38
Steller's Jay	11	5	16
Pacific-slope Flycatcher	13	1	14
Yellow Warbler	13		13
Wilson's Warbler	7	6	13
Hermit Thrush	10	2	12
Townsend's Warbler	7		7
Fox Sparrow	3	3	6
Hairy Woodpecker	5		5
Swainson's Thrush	5		5
Belted Kingfisher	3		3
Chestnut-backed Chickadee	3		3
Eurasian Collared-dove	1		1
Common Raven	1		1
Brown Creeper	1		1
Varied Thrush	1		1
Gray Catbird	1		1
Cedar Waxwing	1		1
Yellow-rumped Warbler (Audubon's)	1		1
TOTAL	366	219	585

Table A.3. Number of all species captured during each day of mist netting at Calvert Island during the June and August 2015 banding periods.

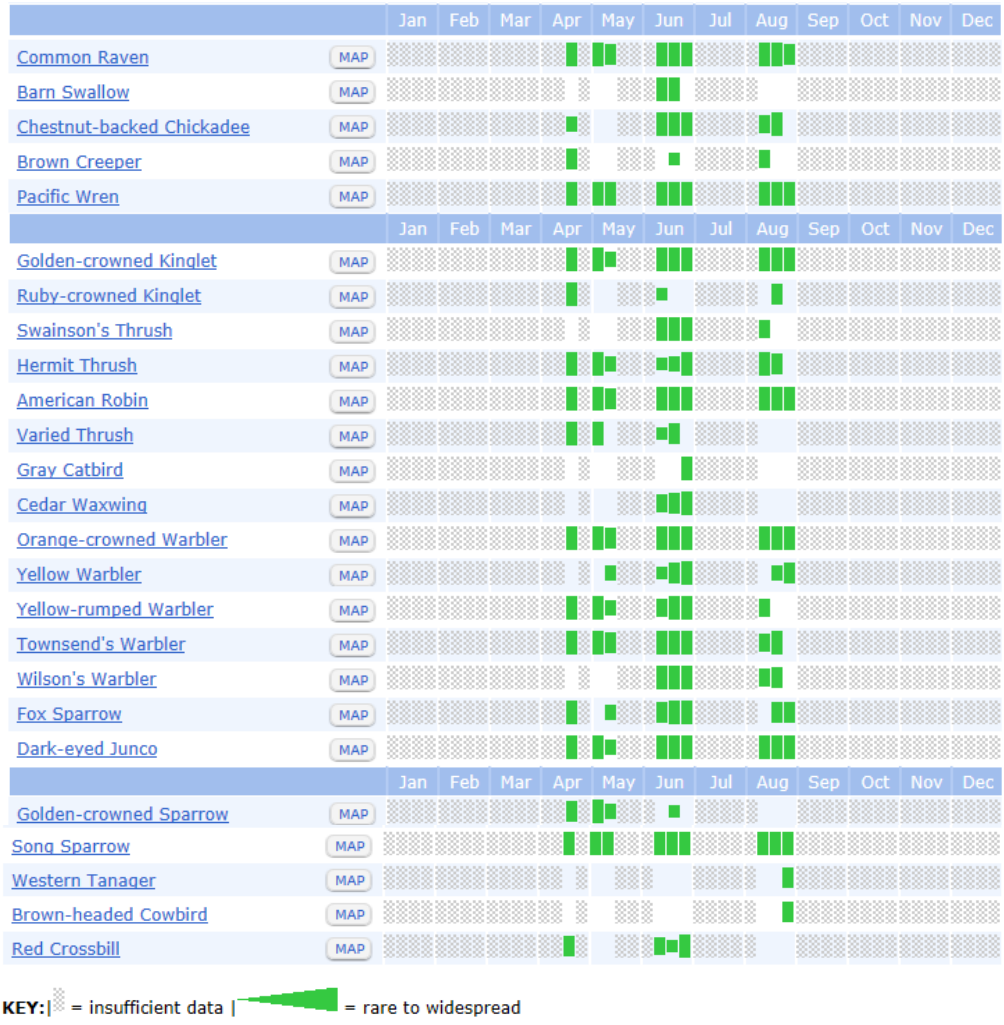
Date	Eurasian Collared-dove	Belted Kingfisher	Hairy Woodpecker	Pacific-slope Flycatcher	Steller's Jay	Common Raven	Chestnut-backed Chickadee	Brown Creeper	Pacific Wren	Golden-crowned Kinglet	Swainson's Thrush	Hermit Thrush	American Robin	Varied Thrush	Gray Catbird	Cedar Waxwing	Orange-crowned Warbler	Yellow Warbler	Yellow-rumped Warbler (Audubon)	Townsend's Warbler	Wilson's Warbler	Fox Sparrow	Oregon Junco	Song Sparrow	Total
11-Jun					2					1	1		3				6				2	1	8	6	30
12-Jun				1	3					7	1	2	5				12						5	3	39
13-Jun	1		2		2				1	3			6			1	8						7	4	35
14-Jun			2	3	1				4	8	2		5				8	4					8	8	53
15-Jun					2				1	1			1				5	1			2	1	9	4	27
17-Jun						1	3		1	8			2				10	1					2	2	30
18-Jun			1						3	3			2				4						2		15
19-Jun				1						7				1			8						2	1	20
20-Jun				1					1	5			2				10					1	2	2	24
21-Jun				1					1	3							16	1			1		7	2	32
22-Jun				1	2				2	9			1		1		14	1	1				14	3	49
12-Aug				2	2			1	1	2		3	1				1						12	3	28
13-Aug				1	1				2	2	1		3										6	2	18
14-Aug		1							5	2		3	1				3				1		5	4	25
15-Aug				2					6	7		2	1				4				1	1	2	1	27
16-Aug									2	2		1					4	1		1	2	1	12	4	30
17-Aug									4								4	1					3	1	13
19-Aug									3	9							1			5	2		5		25
20-Aug		1							3	3			4				3			1	2		2	1	20
21-Aug		1			1				4	1		1	1				1						2	1	13
23-Aug										2							3	3					7		15
24-Aug				1					2	6							2					1	5		17
	1	3	5	14	16	1	3	1	46	91	5	12	38	1	1	1	127	13	1	7	13	6	127	52	585

Table A.4. List of all species observed at Calvert Island during the June and August 2015 banding periods 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.



(continued on next page)

Table A.4. (continued)



Photos B.1. Sample photographs for the Calvert Island pilot banding project during the June and August 2015 banding periods. Photos collected were used for training / teaching purposes of banders as well as public education. Photos courtesy of E. Demers and K. Wetten.


Belted Kingfisher


Townsend's Warbler


Pacific-slope Flycatcher


Eurasian Collared-dove


Yellow Warblers


Common Raven

(continued on next page)

Photos B.1. (continued)


Hairy Woodpecker Wing


Wilson's Warbler


Gray Catbird


Song Sparrows


Golden-crowned Kinglet


Townsend's Warbler Tail

(continued on next page)

Photos B.1. (continued)