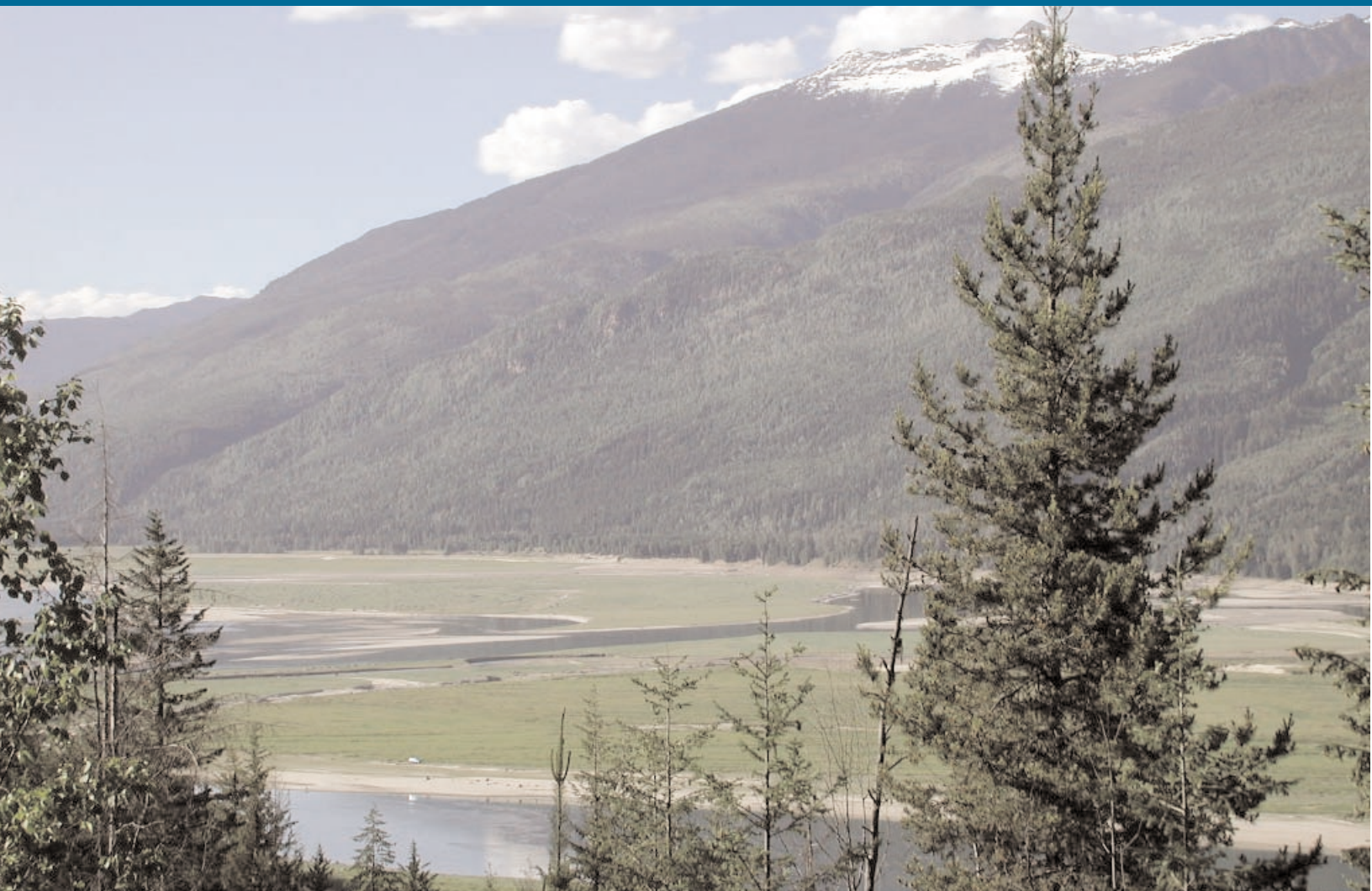


# Columbia River-Revelstoke Migration Monitoring Station Final Banding Report for 2001

2002



*Photo courtesy of Wendy Beauchamp*

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*Prepared for:* BC Hydro Strategic Environmental Initiatives Program  
Evaluation of the Ancillary Benefits of Upper Arrow  
Reservoir Drawdown Zone Revegetation Project

# **COLUMBIA RIVER-REVELSTOKE MIGRATION MONITORING STATION FINAL BANDING REPORT FOR 2001**

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## **Introduction**

The Canadian Wildlife Service (CWS), Parks Canada, and Friends of Mount Revelstoke and Glacier established the Columbia River-Revelstoke Migration Monitoring Station (CRR) in 1998 to track land bird migration activity and provide information on their migration and habitat needs while involving the local community. The CRR station has run since 1998 as a trail project with the goal of setting up a long-term monitoring station that becomes part of the Canadian Migration Monitoring Network (CMMN). The CRR completed the 4<sup>th</sup> year of operations banding 2198 birds during the 2001 fall migration-banding season and will prepare a submission to the CMMN to review for acceptance to the organization.

CRR is located on the Upper Arrow Reservoir on land owned by the Columbia Shuswap Regional District just north of the runway at the Revelstoke Airport. This area known as the Revelstoke Reach Wetlands is a very unusual area within the draw down zone of the Columbia River reservoir system because it contains extensive vegetated areas below the reservoir high water level. This area is typically flooded for only a short period each year and occasionally is not flooded at all. This flooding regime along with a seeding program by BC Hydro has allowed extensive areas of marsh, riparian, and some upland vegetation to survive. In most areas impounded by the Columbia River dams, seasonal flooding kills the majority of vegetation below the high water mark and leaves extensive areas of mud and sand flats which are revealed at low water.

## **Site & Operation**

The site of the operations remained the same as the past 3 years. The station's unique location in a functioning reservoir system causes changes in the variation of the quantity and quality of habitat and water from year to year. The actual vegetation structure of habitat (willow/cottonwood complex surrounded by grasslands) has not changed but due to

the station being subjected to flooding as part of regular hydro production on the Columbia River system the amount of water and available habitat changes with water levels in the Arrow Reservoir. The station is not subject to flooding but will still have water surrounding the area when Reservoir levels are 438.5m or less of the 440m that are in the drawdown zone. Above the 438.5m level the station becomes flooded with various net lanes be unable to be used as was the case in the beginning of 1999 and 2000 season.

The winter of 2000/2001 was a below average snow pack in the Columbia Basin leaving the station with no flooding problems and leaving the Columbia River with low water, which meant the station was not surrounded or inundated by water for any of the season. This was similar to the 1998-banding season, which had a high Reservoir level of 438.5m except that 2001 high was 434m, which is considerable less than full pool for the Reservoir and create much more open grassland complex over the entire Revelstoke Reach area with less water available.

The general operations of the site remained fairly consistent with past years. CRR is operated using a system known as 'Standard effort method', a system that uses the same net lanes and protocols (methods) year after year. This method allows data to be compared from year to year and with other stations throughout North America. 'Net hours', the number of nets times the number of hours they are open is used to standardize effort as birds captured per net hour. There are many factors that reduce the potential maximum number of net hours (e.g., 6 hours per day for the whole period of banding times the number of operational nets) including wind, rain, and lack of trained personnel to handle birds. A normal day of operation began 30 minutes before sunrise for a standard 6-hour period with 10-12 nets open

This year the banding operations began on August 1 and ran until September 30 for 56 days of banding (50 full days and 6 partial days). A total of 2198 birds were captured in the 3468.6 net hours for an average of 0.63 birds per net hour. (Figure 1) The only change that occurred this year that would affect data collection was the start of a daily census and general observations nearly every day for the month of August. A daily census is a fixed route followed by an observer at a set time that records all birds seen and/or heard. The census along with general observations and daily banding totals allows a calculation of 'estimated totals' (ET), which incorporates species not caught to be recorded, (see Appendix 5 for species list) and is currently being used in many migration monitoring stations throughout North America. The data from the census will not be used for this year, as there was not consistent coverage and the protocol for tabulating the totals needs to be reviewed and adapted to the station but species that were recorded are recorded in Appendix 2. The hiring of an assistant for the month of August who had the necessary skills to do this allowed for this to happen for the first time in the 4 years and will be a goal for future years.

**Figure 1: Columbia River - Revelstoke  
Bird Monitoring Station Summary Statistics 1998-2000**

<b>Year</b>	<b>Birds Handled</b>	<b>Banding Days</b>	<b>Net Hours</b>	<b>Birds per Net Hour</b>
1998	2748	42	2247	1.22
1999	1139	45	1687	0.68
2000	1563	47	2331	0.67
2001	2198	56	3468.6	0.63
Total	7648	190	9723.6	0.79

### **BANDED BIRDS**

There was a total 1389 individual new birds banded, 752 recaptures, and 57 unbanded birds for a total of 2198. A total of 54 species were captured in the mist nets with 53 being banded and/or processed, while 1 species (Rufous Hummingbird) was released unbanded at the nets whenever encountered. There was the capture of 3 species which are considered rare for this area: 1 'after hatch year' Cassin's Vireo on September 8; 1 'hatch year' female Connecticut Warbler on September 12 (never recorded before in this area); 1 'hatch year' male Chestnut-side Warbler on September 30. Birds that are banded are expected to be aged using methods recognized by the Banding Office to 'After-Hatch Year' (a bird born in a previous year) or 'Hatch Year' (a bird that was born that year), and for some species 'Second Year', 'After Second Year' and 'After Third Year'. During the fall migration season it is usually only possible to distinguish between an 'After Hatch Year' or 'Hatch Year' due to the loss of feathers or other characteristic that make it possible to tell a 'Second Year' bird from other 'After Hatch Year' birds.





Gray Catbird in Net

Of the 2,141 birds that were processed in the 2001 season a total of 1,817 were birds that were aged as 'hatch year' and 324 were aged as 'After hatch Year', 'After Second Year', or 'Second Year'. If one looks at the individuals and their age ratios, we discover a 5.6:1 ratio of 'Hatch year' to 'After Hatch Year'. This is common and expected after a successful breeding season, as the breeding birds should be able to fledge a good number of 'hatch year' birds to maintain populations as the survival rate of 'hatch year' birds are low. This ratio is a higher ratio than the Vaseux Lake Bird Observatory (Hunter 2001) for the 2001(2:1) season but will need to have further years of study to be able to determine a ratio for this area.

If isolated and analyzed the five most common species Common Yellowthroats, Yellow-rumped Warblers, Traill's Flycatcher, Orange-crowned Warbler and Yellow Warbler we discover a large variance in the ratios. (Figure 2.) The variance between species may be a factor of a number of items including but not limited to: 'After Hatch Year' birds migrate earlier, may not use the same stop-over or resting place that 'hatch year' birds do; 'After Hatch Year' birds are more careful than 'hatch year' birds, therefore not as likely to end up in nets; there are more 'hatch year' birds to be caught in the fall due to the survival rates.

**Figure 2: Ratio of 'Hatch Year' Birds to 'After Hatch Year' Of the 5 Top Species**

Species	Total number birds handled	Ratio
Common Yellowthroat	565	5.6:1
Yellow-rumped Warblers	239	7.5: 1
Traill's Flycatcher	194	4:1
Orange-crowned Warbler	185	45:1
Yellow Warbler	148	3:1

## SEXING

The 2001 banding season saw 923 of the 2,141 birds banded (43%) could not be sexed and left in the 'Unknown Sex' category. There were 817 birds (38%) identified as males and 403 birds (18%) identified as females. The banding season falls outside of the breeding season for most of the species caught at the CRR Station. This makes sexing of individuals hard for species that have the same plumage for male and females or may not be able to be sexed unless certain characteristics appear leaving a large number of birds in the 'unknown' category of sex.

One reason that more birds were identified as male than females may be due to the fact that many of the top species at the CRR station can be 'hatch year males' if they show certain characteristics, but if they don't show those characteristics they need to be classed as 'unknown', *e.g. A 'hatch year' common yellowthroat if it shows some of a black mask it can be classed as male but if they don't it needs to be identified as 'unknown' as it may develop the black mask through the next number of months or might be a female.*

## RECAPTURES

There were a total of 752 records of recaptured birds for the 2001 season. A 'Recaptured bird' is any bird that has band on it when taken from the net regardless of when it was banded. This number may be missing leading as many of the recaptures are birds that were newly banded this year. The vast majority of these birds are using the place for stop over foraging habitat for few days or birds that are locally breeding birds. By tracking the recaptures we are able to track some birds length of stopover, molting patterns and sequence, and weight gain or loss. This information will enable a better status of certain species to be obtained over the long-term.

Not all of this years 'recaptures' are birds that were banded in the 2001 season at the CRR. There were 45 of birds that were either banded in other years at CRR or other banding locations in the area.

## Conclusion and Recommendations

1. The CRR station has completed 4 successful years of fall migration monitoring with the completion of the 2001 season. The CRR station located in a functioning reservoir has many challenges associated with operating a migration monitoring station. The past 4 years have seen various waterlevels from high (1999/2000) to low (2001); even-though the station may be subject to flooding and potentially reducing the amount of days and nets used in a season this location is still the first choice for a migration monitoring station on this stretch of the Columbia River.

A protocol for the station should be submit to the CMMN for review with changes being made during the 5<sup>th</sup> season during the fall of 2002.

2. The Revelstoke Reach wetland in which the CRR station is located is unique system not only on the Columbia River from Donald to the Pacific Ocean but perhaps throughout North America. The vegetation that is the vital component of this area is unique in its ability to survive the inundation of a reservoir system. The increased knowledge of the various flooding regimes, vegetation, wildlife and fish will not only facilitate better resources understanding but also have the potential copied elsewhere.
3. The use of the area by landbirds must co-exist with reservoir operations, wildlife, fish, and recreational use. The data collected at the station is currently be used for the 'Water-Use Plan' for the Columbia River to look at future operations of the dams to avoid or reduce threats to migrating landbirds. The data gathered at the station will provide local residents and land-use managers a better understanding of the landbirds use and needs over time.

## **ACKNOWLEDGEMENTS**

The Columbia River-Revelstoke (CRR) Migration Monitoring Station is a project of the Friends of Mount Revelstoke and Glacier, Canadian Wildlife Service, and Parks Canada as part of Bird Studies Revelstoke. We gratefully acknowledge funding from the Canadian Pacific Railway Ltd, BC Hydro, Shell Environmental Fund Ltd., and the Canadian Wildlife Service. We would also like to acknowledge and thank the Columbia Shuswap Regional District for allowing the station to operate on the Revelstoke Airport Lands.

A special thank you to the following volunteers for there help through out the season: Jennifer Healey, Jon Healey, Wanda Jarvis, Weldon Jarvis, Mas Matsushita, Patty Matsushita, Dorothy Philips, Jon Philips, Kristen Smit, Natasha Redman, John Woods and Herma Worman

## **Literature Cited**

Hunter, T. 2001. Vaseux Lake Bird Observatory Final Banding Report 2001. Typed

## Appendix 1

### Species with 15 or more captures per year, 1998-2000.

Columbia River-Revelstoke Migration Monitoring Station, British Columbia

Most Common Handled Species	Subspecies	1998	1999	2000	2001
Common Yellowthroat		1468	371	682	565
Yellow-rumped Warblers	Audubon's Warbler, Myrtle Warbler, unidentified Yellow- rumped Warbler	500	66	129	239
Yellow Warbler		236	94	86	148
Trail's Flycatcher	Alder Flycatcher Willow Flycatcher	67	75	173	194
Red-eyed Vireo		14	24	21	75
Warbling Vireo		10	3	42	83
Orange-crowned Warbler		60	59	26	185
Lincoln's sparrow		50	38	32	46
Song Sparrow		49	30	49	23
MacGillivray's Warbler		48	31	15	67
American Redstart		47	54	60	116
Black-capped Chickadee		38	10	14	26
American Goldfinch		0	19	1	8
Wilson's Warbler		35	81	36	108
Gray Catbird		3	24	40	39
Dusky Flycatcher				14	17
Least Flycatcher				15	48
Townsend's Warbler				4	15



## Appendix 2

### August 2001 Banding Totals

Columbia River-Revelstoke Migration Monitoring Station

DATE	NEW	RECAP	NEW BIRDS PER DAY	SAME DAY RECAP	UNBANDED	TOTAL FOR DAY	Total for year
<b>Aug 1</b>	37	2	39	5	1	45	<b>45</b>
<b>2</b>	19	7	26	3	4	33	<b>78</b>
<b>3</b>	14	3	17	3	4	24	<b>102</b>
<b>4</b>	38	17	55	3	5	63	<b>165</b>
<b>5</b>	30	12	42	3	3	48	<b>213</b>
<b>6</b>							
<b>7</b>							
<b>8</b>	25	5	30	2		32	<b>245</b>
<b>9</b>	39	20	59	4	3	66	<b>311</b>
<b>10</b>	38	16	54	6	2	62	<b>373</b>
<b>11</b>	28	16	44	3	3	50	<b>423</b>
<b>12</b>	35	17	52	3	3	58	<b>481</b>
<b>13</b>	24	11	35	10	2	47	<b>528</b>
<b>14</b>	20	8	28	5	1	34	<b>562</b>
<b>15</b>	22	14	36	3		39	<b>601</b>
<b>16</b>	11	9	20	4		24	<b>625</b>
<b>17</b>	22	27	49	5		54	<b>679</b>
<b>18</b>							
<b>19</b>	59	19	78	22	4	104	<b>783</b>
<b>20</b>	25	14	39	5	1	45	<b>828</b>
<b>21</b>	30	21	51	7	1	59	<b>887</b>
<b>22</b>							
<b>23</b>	4	11	15	1		16	<b>903</b>
<b>24</b>							
<b>25</b>	32	19	51	11		62	<b>965</b>
<b>26</b>	23	6	29	9		38	<b>1003</b>
<b>27</b>	17	12	29	4		33	<b>1041</b>
<b>28</b>	21	4	25	5	1	31	<b>1072</b>
<b>29</b>	31	5	36	9		45	<b>1117</b>
<b>30</b>	30	6	36	14	2	52	<b>1169</b>
<b>31</b>	47	4	51	16	1	68	<b>1237</b>

## Appendix 3:

### September 2001 Banding Totals

Columbia River-Revelstoke Migration Monitoring Station

DATE	NEW	RECAP	NEW BIRDS PER DAY	SAME DAY RECAPS	UNBANDED BIRDS	TOTAL BIRDS PER DAY	TOTAL BIRDS PER YEAR
<b>Sept.1</b>	10	5	15	5		20	<b>1257</b>
<b>2</b>	100	10	110	19	4	133	<b>1390</b>
<b>3</b>	16	16	32	13		45	<b>1435</b>
<b>4</b>	77	14	91	21	1	113	<b>1548</b>
<b>5</b>	19	12	31	8		39	<b>1587</b>
<b>6</b>	39	9	48	8		56	<b>1643</b>
<b>7</b>	27	4	31	3		34	<b>1677</b>
<b>8</b>	32	7	39	7	3	49	<b>1726</b>
<b>9</b>	29	7	36	6		42	<b>1768</b>
<b>10</b>	16	4	20	3		23	<b>1791</b>
<b>11</b>	10	3	13	2		15	<b>1806</b>
<b>12</b>	12	1	13	3	1	17	<b>1823</b>
<b>13</b>	13	3	16	2		18	<b>1841</b>
<b>14</b>	5		5	2		7	<b>1848</b>
<b>15</b>	9	1	10	4		14	<b>1862</b>
<b>16</b>	17	2	19	4		23	<b>1885</b>
<b>17</b>	14	1	15	1	1	17	<b>1902</b>
<b>18</b>	29	2	31	7		38	<b>1940</b>
<b>19</b>							
<b>20</b>	35	4	39	6		45	<b>1985</b>
<b>21</b>							
<b>22</b>	32	7	39	14	1	54	<b>2039</b>
<b>23</b>	9	9	18	1	2	21	<b>2060</b>
<b>24</b>	12	5	17		1	18	<b>2078</b>
<b>25</b>	17	6	23		1	24	<b>2102</b>
<b>26</b>							
<b>27</b>	2	1	3	1		4	<b>2106</b>
<b>28</b>	31	6	37	2		39	<b>2145</b>
<b>29</b>	15	6	21	2		23	<b>2168</b>
<b>30</b>	25	4	29	1		30	<b>2198</b>

## Appendix 4

### Columbia River – Revelstoke Migration Monitoring Station

Partial species list of Revelstoke area birds and their coverage by other surveys

Banded (X), Captured and Unbanded (C), Observed (\*), Census recorded (R)

Good = >60% breeding / winter range covered by seasonal surveys

Poor = <60% breeding / winter range covered by seasonal surveys

Species	CRR 2001	CRR 2000	CRR 1999	CRR 1998	Breeding Bird Survey	Winter Range Coverage
Solitary Sandpiper	*	*	C	*	Unknown	Unknown
Common Snipe	R	*	C	X	Unknown	Unknown
Band-tailed Pigeon	*	*	*	*	Good	Poor
Mourning Dove	*	*	*	*	Good	Good
Sharp-shinned Hawk	X	*	*	C	Unknown	Unknown
Common Nighthawk	*	*	*	*	Poor	Poor
Black Swift	*	*	*	*	Poor	Poor
Vaux's Swift	*	*	*	*	Poor	Poor
Calliope Hummingbird		*	*	*	Good	Poor
Rufous Hummingbird	C	C	C	*	Poor	Poor
Belted Kingfisher	R	*	*	*	Poor	Good
Lewis' Woodpecker			*	*	Good	Good
Red-naped Sapsucker	*	*	C	*	Good	Good
Downy Woodpecker	X	X	C	X	Poor	Good
Hairy Woodpecker	R	*	C	*	Poor	Good
Northern Flicker	X	*	*	*	Poor	Good
Pileated Woodpecker	R	*	*	C	Unknown	Unknown
Olive-sided Flycatcher	*	*	*	*	Poor	Poor
Western Wood-Pewee	X	X	*	X	Poor	Poor
Willow Flycatcher	X	X	X	X	Good	Poor
Alder Flycatcher	X	X	X	X	Poor	Poor
Least Flycatcher	X	X	X	X	Poor	Poor
Hammond's Flycatcher	X	X	X	*	Poor	Poor
Dusky Flycatcher	X	X	X	X	Poor	Poor
Yellow-bellied Flycatcher		X			Unknown	Unknown
Western Flycatcher		*	*	*	Good	Poor
Eastern Kingbird	*	*	*	*	Poor	Poor
Western Kingbird	*	*	*	*	Good	Poor
Northern Shrike	*	*	*	X	Poor	Good
Solitary Vireo (Cassin's)	X	X	*	*	Poor	Poor
Warbling Vireo	X	X	X	X	Poor	Poor
Red-eyed Vireo	X	X	X	X	Poor	Poor
Clark's Nutcracker	*	*	*	*	Good	Good
American Crow	R	*	*	*	Poor	Good
Common Raven	R	*	*	*	Good	Good

Horned Lark	*	*	*	*	Poor	Good
Tree Swallow	*	*	*	*	Poor	Poor
Violet-green Swallow	*	*	*	*	Poor	Poor
Northern Rough-winged Swallow	*	*	*	*	Good	Poor
Bank Swallow	*	*	*	*	Poor	Poor
Barn Swallow	*	*	*	*	Poor	Poor
Cliff Swallow	*	*	*	*	Poor	Poor
Black-capped Chickadee	X	X	X	X	Poor	Good
Boreal Chickadee	*	*	*	*	Poor	Good
Red-breasted Nuthatch	X	*	*	*	Poor	Good
Brown Creeper	*	C	C	X	Poor	Good
Marsh Wren		*	*	*	Good	Good
House Wren	*	X	*	X	Good	Poor
Winter Wren	X	C	*	*	Poor	Good
Golden-crowned Kinglet	X	X	X	X	Poor	Good
Ruby-crowned Kinglet	X	X	X	X	Poor	Good
Townsend's Solitaire	*	*	*	*	Poor	Good
Veery	X	X	X	X	Good	Poor
Swainson's Thrush	X	X	X	X	Poor	Good
Hermit Thrush	*	*	*	X	Poor	Good
American Robin	X	X	X	*	Poor	Good
Varied Thrush	*	*	*	*	Poor	Good
Gray Catbird	X	C	C	X	Good	Poor
European Starling	*	*	*	*	Poor	Good
American Pipit	*	*	*	*	Poor	Poor
Cedar Waxwing	X	X	X	*	Poor	Good
Tennessee Warbler	X	*	X	*	Poor	Poor
Orange-crowned Warbler	X	X	X	X	Poor	Poor
Nashville Warbler	X	X	X	*	Good	Poor
Yellow Warbler	X	X	X	X	Poor	Poor
Chestnut-sided Warbler	X		X	*	Poor	Poor
Magnolia Warbler	*	*	X	*	Poor	Poor
Audubon's Warbler	X	X	X	X	Poor	Good
Myrtle Warbler	X	X	X	X	Poor	Good
Townsend's Warbler	X	X	X	X	Poor	Poor
Western Palm Warbler				X	Poor	Good
Blackpoll Warbler			*	X	Poor	Poor
American Redstart	X	X	X	X	Poor	Poor
Ovenbird			X		Poor	Poor
Northern Waterthrush	X	X	X	X	Poor	Poor
MacGillivray's Warbler	X	X	X	X	Poor	Poor
Connecticut Warbler	X					
Common Yellowthroat	X	X	X	X	Poor	Poor
Wilson's Warbler	X	X	X	X	Poor	Poor
Western Tanager	X	X	X	X	Poor	Poor
Spotted Towhee			*	*	Good	Good

American Tree Sparrow			*	X	Poor	Good
Chipping Sparrow	*		*	X	Poor	Poor
Clay-colored Sparrow	X	X	*	X	Poor	Poor
Savannah Sparrow	X	X	X	X	Poor	Poor
Fox Sparrow	*	*	X	X	Poor	Good
Song Sparrow	X	X	X	X	Poor	Good
Lincoln's Sparrow	X	X	X	X	Poor	Poor
Swamp Sparrow	X	X	X	X	Poor	Good
White-crowned Sparrow	X	X	X	X	Poor	Good
White-throated Sparrow	X	X	X	*	Poor	Poor
Golden-crowned Sparrow	*	X	*	*	Poor	Good
Dark-eyed Junco	X	X	X	X	Poor	Good
Slated-coloured Junco	*	*	X	*	Poor	Poor
Black-headed Grosbeak	*	*	*	*	Good	Poor
Lazuli Bunting	X	X	X	*	Good	Poor
Bobolink	*	*	*	*	Good	Poor
Red-winged Blackbird	X	*	X	X	Poor	Good
Western Meadowlark	*	*	*	*	Good	Good
Yellow-headed Blackbird	*	*	*	*	Poor	Poor
Rusty Blackbird			*	*	Poor	Good
Brewer's Blackbird	*	*	*	*	Poor	Good
Brown-headed Cowbird	*	C	*	X	Good	Good
Bullock's Oriole			*	*	Good	Poor
Gray-crowned Rosy-finch	*	*	*	*	Poor	Good
Pine Grosbeak	*	*	*	*	Poor	Good
Purple Finch	*	*	*	*	Poor	Good
House Finch	*	*	*	*	Good	Good
White-winged Crossbill	*	*	*	*	Poor	Good
Pine Siskin	R	*	X	*	Poor	Good
American Goldfinch	X	X	X	*	Good	Good
Evening Grosbeak	*	*	*	*	Good	Good