

SUMMER 2019 VOLUME 77.2

BLUE JAY



8

The results of the 77th annual Christmas Bird Count (CBC) in Saskatchewan are in, but did the 2018 count prove to be one of the most exciting on record, or one of the duller of the century?



22

Data about the distribution of the prairie pasqueflower in Saskatchewan is lacking. In this paper, Vladimir Kricsfalusy fills in the existing information gap by providing detailed distribution records of prairie pasqueflower collected during one century of observations (1920-2018).



32

Donna Firby Gamache documents the occurrence of three Eurasian Collared-Doves in her MacGregor, MB yard in February 2018 and discusses their spread across the United States and southwestern Canada.



40

In early May of 1885, teamster A. McCarthy of Pense was engaged to convey supplies from Swift Current to Battleford in wake of Colonel Otter's regiment. About 32 km north of Swift Current, McCarthy observed a large flock of Whooping Cranes in a "slough". Evidently, these birds had been feeding and resting in the course of their northward migration.



42

Walter Krivda was a long-time resident and teacher at The Pas who studied natural history in the area for many decades, and was instrumental in encouraging youth's interest in nature. He published numerous articles in Blue Jay, and contributed large and important collections of plants and insects to museums. See page 42 for an obituary.



52

Environmental educator and writer Kim Epp highlights the importance of providing water to wildlife during hot weather.

FROM THE PRESIDENT

Ed Rodger
President, Nature Saskatchewan

Nature Saskatchewan, like most organizations, periodically develops a plan of its major priorities and work items. In our case, this is a strategic plan updated every three years. The latest one was drafted late last year, and finalized and ratified earlier this year. I thought I'd use this column to talk about this latest plan.

The Nature Saskatchewan Strategic Plan is put together in a general meeting of Board members and staff, with some discussion documents circulated ahead of time. Items within

the plan are organized into the five categories also used in our financial reporting: Conservation, Education, Research, Member Services and Administration. Several strategies are formulated within each of these categories, and for each a target completion date is set, as well as who is responsible to work on it, among both staff and Board members.

There are more items in the plan than I could cover here, but I'll outline some main themes (in no particular order) that may be of interest to NS members and *Blue Jay* readers. Perhaps a good thing to mention first, with the recent success of the *Birds of Saskatchewan* book, is that the plan reaffirms Nature Saskatchewan's role as a publisher, and in fact seeks to strengthen our presence as a publisher in the province. This includes the *Blue Jay*, where we will seek to expand content, and complete its establishment in an online format.

In conservation activities, the plan acknowledges that Nature Saskatchewan could have more focus on the parkland and boreal forest regions of the province, to complement our activity in the southern part of the province. The plan includes initiatives for many established NS projects, such as the Last Mountain Bird Observatory and the Important Bird Areas program. It also addresses current programs that have an educational focus, such as NatureHood.

The Nature Saskatchewan plan also addresses the importance of partnerships in our activities. There are work items that speak to reinforcing or expanding our work with organizations such as Nature Canada, and with local nature societies, landowners in the Stewards of Saskatchewan program, and the Conservation Data Centre here in

As I mentioned, I'm not able to provide a full view of what the NS plan contains, but I hope this gives a flavor of its scope. I'm looking forward to working on the new plan with the Nature Saskatchewan staff, Board, members, partners, and the general public, and should have more to say about it at future meets or in future *Blue Jay* columns. 🐦



Ed Rodger

Saskatchewan, as well as looking at further partnership opportunities among the university and First Nations communities.

The plan also has items related to Nature Saskatchewan membership, including ways to better engage NS members and supporters, and including a survey of members; it also looks for ways to expand our member or supporter communities. There are also plan items related to the organization's communication with its members and the general public.

Finally, any plan for Nature Saskatchewan will acknowledge its role as an employer, and its financial management responsibilities, so the plan includes several items that cover policy and administration for organizational functions.

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ON THE FRONT COVER

The pasqueflower, or prairie crocus, is the true harbinger of spring. It braves the frosts and high winds on the prairie to be the first plant to bloom each year.

Photo credit: Vladimir Kricsfalusy



ON THE BACK COVER

The sun sets over Crystal Lake, Saskatchewan, located just north of Yorkton in the Aspen Parkland. Turn to page 54 to read this issue's edition of *Human Nature*, in which Andrea Olive shares her connection with Crystal Lake and how her love of nature was born at this location.

Photo credit: Andrea Olive

Blue Jay, founded in 1942 by Isabel M. Priestly, is a journal of natural history and conservation for Saskatchewan and adjacent regions. It is published quarterly by Nature Saskatchewan.

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Editorial Information

Blue Jay welcomes all submissions, preferably by e-mail (although handwritten or typed manuscripts will be considered to accommodate those who do not have access to computer equipment), polished or in need of some editorial assistance. All items for publication should be sent to the editor electronically (in a Microsoft Word document) by e-mail or on CD. Hard copies and CDs can be mailed to the editor at the address above.

Submission deadlines

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Ramona Clarke
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NATURE SASKATCHEWAN STAFF SWITCHEROO

We are excited to announce that two Nature Saskatchewan staff members will be welcoming their own 'young' this spring! Lacey Weekes, Nature Saskatchewan's Conservation and Education Manager, will begin her maternity leave on May 1, and Ashley Vass, the Rare Plant Rescue Coordinator, will be on leave as of May 13.

With two staff members on maternity leave at the same time, which has often been the case, in addition to Kaytlyn Burrows returning from an education leave, there are a lot of musical chair style changes planned for the spring.

As of May 21, Kaytlyn Burrows will be returning to her role as Operation Burrowing Owl Coordinator, and Emily Putz (who had been filling in for Kaytlyn) will move into the Rare Plant Rescue Coordinator position once Ashley's leave begins. Rebecca Magnus, the Coordinator for the Shrubs for Shrikes, Plovers on Shore, and Stewards of Saskatchewan banner programs will fill in for Lacey as the Conservation and Education Manager, and Shirley Bartz will cover Rebecca's position (see Shirley's bio to the right on this page). Melissa Ranalli will remain in her position as the Species at Risk Manager. Because everyone has been working closely for a number of years, this transition will be as seamless as possible.

By the time of publication, the winter weather should have let up and program staff will hopefully have muddied their boots in the field. Stay tuned for our blog posts throughout the summer field work. We look forward to catching up with all of you in the near future.

Please find updated information for the affected staff below:

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Shrubs for Shrikes,
Plovers on Shore, and
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Melissa Ranalli:

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Shirley Bartz was born and raised far from the Prairies. Whether she was backpacking in the Sierra Nevada Mountains, cross country skiing in the Los Padres National Forest, or rock-hopping in the hoodoos of Joshua Tree, Shirley was always watching birds, chasing lizards, staring at bugs and tracking mammals. Following her passion for studying living things, Shirley completed a B.Sc. in wildlife management, worked as a field biologist for 10 years, and then completed a M.Sc. in biology. Shortly thereafter, she moved to Winnipeg and soon settled out in Regina. In the 13 years that she's lived in the Prairies, she's found the rolling grasslands as comforting as the sage and chaparral of her native southwestern U.S., and takes a similar joy in feeling small under the Prairie sky as she did on the shores of the Pacific Ocean.

Shirley delights in sharing her passion for stewardship of rare species, and in reciprocal learning about conservation and restoration of native ecosystems. While in her temporary position as Habitat Stewardship Coordinator, Shirley is looking forward to applying her experience engaging with multi-use land owners and monitoring species at risk. She hopes to continue working with Nature Saskatchewan long into the future. 🐦

ANDREW ELGIN RECEIVES 2019 GRADUATE STUDENT SCHOLARSHIP

Nature Saskatchewan awards an annual scholarship in the amount of \$2,000 to assist a graduate student attending a post-secondary institution in Saskatchewan. The Margaret Skeel Graduate Student Scholarship was established with the aim to stimulate research that will increase knowledge of all aspects of the natural world and human relation with nature, and to promote conservation of natural ecosystems and sustainable use of natural resources.

The 2019 scholarship recipient is Andrew Elgin, who is working toward his Master's degree in biology at the University of Saskatchewan in Saskatoon. The focus of his research

is to assess the potential for prairie wetlands to mitigate intensive agriculture's negative impact on aerial insectivorous birds. For his field work, Andrew is studying biology and foraging behaviour of Tree Swallows, and the importance of intact wetlands in agricultural landscapes for maintenance of bird biodiversity. Andrew is hoping that his graduate project will improve understanding of conservation value of prairie pothole ecosystems in south-central Saskatchewan, where wetlands may act as islands of habitat and biodiversity in a landscape dominated by the cropland.

Andrew is also very active in the local community. He is a member of



the Saskatoon Nature Society, where he has led many bird watching trips and shared his enthusiasm and knowledge of birds with the public.

We congratulate Andrew and wish him success in pursuit of his studies. 🐦

WELCOMING THE LMBO SUMMER STAFF

Nature Saskatchewan would like to welcome back Jordan Rustad as Bander-in-Charge for our Last Mountain Bird Observatory (LMBO), as well as Kayla Hatzel as banding assistant. They will be responsible for monitoring migratory song birds in the spring and fall through bird banding and daily census. They will also assist with our education programs, teaching the general public, school groups and volunteers about bird banding and conservation. Jordan will also assist with our Important Bird and Biodiversity Areas program doing site monitoring, connecting with volunteer caretakers, and updating site summaries.



Jordan Rustad is originally from the small farming community of Avonlea, which is familiar to some for its local attractions including Dunnet Regional Park and the Avonlea Badlands. Jordan's passion for animals began on her family farm where she raised a variety of animals. She became interested in birds after a high school work placement in the Bird and Bat lab at the University of Regina (U of R). Jordan had the opportunity to visit the MAPS banding station at Craven, and got to extract birds from the mist nets. She heard about Last Mountain Bird Observatory from Avonlea's librarian, Randi, who suggested that she go banding with Randi's partner, Alan Smith, at Last Mountain Bird Observatory. Since then, Jordan has volunteered or worked at the bird observatory every summer. She recently graduated from the U of R, where her studies were focused on ecology and environmental studies, with a major in Biology. When she's not being a bird nerd, Jordan enjoys reading fiction and history, as well as knitting. She looks forward to working with Nature Saskatchewan this summer and hopefully adding a few new bird species to her checklist!



Kayla Hatzel is a Saskatchewan native who grew up in Saskatoon and spent many holidays and summers on her family farm/ranch near Beechy. Rain or shine, Kayla could always be found outdoors with a trail of tame, and not-so-tame, animals not far behind. She has always wanted to work with animals and nature, and is passionate about conservation and continually learning about the natural world. She obtained a Bachelor of Science degree in Biology at the University of Saskatchewan in 2014. Her first field job was with Nature Saskatchewan in 2013 working as a summer assistant. Since then, she has been working as a Wildlife Biologist in the private sector in Saskatchewan, Alberta and British Columbia. She now calls the RM of Parkdale her home, along with her partner, dog, three cats, two rabbits, and six chickens. She is very excited to be part of the Nature Saskatchewan team again as a bird bander at Last Mountain Lake. 🐦

WANTED



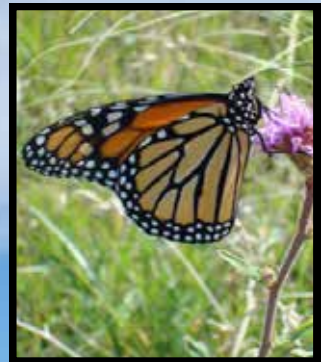
Burrowing Owl



Piping Plover



Loggerhead Shrike



Monarch Butterfly

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Funding Available for habitat enhancement projects on land with species at risk, including native grass seeding, wildlife-friendly fencing, and water development sites.

Contact Nature Saskatchewan at 306-780-9833 for more information.

77TH ANNUAL SASKATCHEWAN CHRISTMAS BIRD COUNT - 2018

Alan R. Smith and Randi Edmonds
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As readers will soon see, the Christmas Bird Count of 2018-19 was one of the dullest of the century. Of some interest, however, are two changes to the count. The Gray Jay has officially been renamed the Canada Jay, and the Squaw Rapids Count has been renamed the E. B. Campbell Dam Count. All Canadians will applaud both changes; our First Nations, in particular, should approve the second.

The Counts

The number of counts declined by three counts to 86 over last year's 89. Total effort as measured by hours in the field and at feeders, or kilometres walked and driven was, however, about average for the last 20 years.

The Weather

Average minimum and maximum temperatures for the count period (with 2017-18 records in brackets) were -10 to -5 C (-18 to -12 C), wind speeds 8 to 19 km/h (9 to 18 km/h), and snow depths 6 to 14 cm (6 to 14 cm). As can be seen, temperatures this past winter were warmer, while wind speeds and snow depths were similar to the previous winter.

The Birds

The 108,164 birds counted was lower than last winter's 127,798 and the century average of 125,000. This is partly due to fact that there was no count conducted at Coronach, which usually hosts at least 10,000 waterfowl. The 88 species recorded

on count day was the fewest since 1992 when 77 species were tallied. The average number of species per count at 18.2 was, however, on par since 2000.

Regina with 41 species (plus 1 during the count period) won the crown for the most species; the runner up was Gardiner Dam with 40 species.

Population Trends

Waterfowl were generally found in smaller numbers and fewer localities than normal. Record high counts of Ring-necked Duck and Lesser Scaup were, however, recorded at Gardiner Dam (Table 6).

Most raptors were generally scarce this winter. For example, there were no reports of Northern Harriers and only six Short-eared Owls were seen — all on the Regina Count. Snowy Owls were also harder to find with only 84 in 29 localities compared to 181 in 33 localities the last winter.

The range expansion for two introduced species, Eurasian Collared-Dove and House Finch, seems to have stalled. The only new CBC localities for the dove, Dundurn and White Bear, should be regarded as "infilling" rather than expansion, but the appearance of House Finches at one new locality at Melfort is a 100 km expansion to the northeast.

Bohemian Waxwings dropped from 12,590 in 33 localities in 2016-17 to 7,469 in 28 localities in 2017-18 to only 3,312 in 22 in 2018-19. This is in spite of the fact

that the wild food crop was reported "good" or better in more areas this past winter than in the previous two. Fortunes of another boreal species, the Red-breasted Nuthatch, were much better with 823 birds in 66 localities versus 377 in 44 last winter.

Numbers of the subarctic-nesting Common Redpoll were way down with only 3,412 birds on 55 counts compared to 14,307 on 78 counts in 2017-18. Such "year on year off" fluctuations are, however, the norm for the species. Numbers of most other finches were also down.

Rarities

The few rarities of note include our sixth Double-crested Cormorant at Gardiner Dam and our fifth Great Blue Heron at Regina. No new species were recorded for the CBC; the all-time total remains at 191 species.

Note: for purposes of Saskatchewan Counts as published herein, the count period extends from December 14 to January 5; Audubon counts include only those species recorded three days prior to and after the count day.

Count areas and participants (names of compilers are in italics)

1. ARCHERWILL. Sharren Carlson, Shauna Etsell, Gerald Hiron, Susan Hiron, Audrey Hnetka, Perry Hnetka, *Elaine Hughes*, Dorothy Klettberg, Willie Klettberg, Annette Kozak.

2. AVONLEA. *Alan Smith*, Blaine Sudom.

3. BALGONIE. Brian Armstrong, Lionel Bonneville, Joel Cherry, Jared Clarke, Rowan Clarke, Teal Clarke, Ken Feltin, Dale Hjertaas, Phil Holloway, Fran Kerbs, Laurie Koepke, Kristen Martin, Annie McLeod, *Brett Quiring*, Vera Raschke, Dan Sawatzky, Kathy Schaffer, Scott Schaffer, Hanna Walczykowski, Jacklyn Waronek.

4. BIGGAR. Dale Booth, Ryan Dudragne, *Guy Wapple*, Rob Wapple.

5. BIRCH HILLS. Margaret Mareschal, *Maurice Mareschal*.

6. BORDEN-RADISSON. Greg Fenty, *Kyron Giroux*, Ron Jensen, Jennipher Karst, Scott Olshanoski, Nick Saunders,

7. BROADVIEW. Doug Boivin, Barb Weidl, *Don Weidl*.

8. CANDLE LAKE. David Britton, Kevin Moore, *Vicki St. Germaine*, Warren St. Germaine.

9. CATER. Beverly Beland, *Orval Beland*, Donna Long.

10. CHATSWORTH. Herb Cross, Jean Cross, Charles Dyck, Donna Dyck, Robert Mess, Wionna Mess, *George Murray*, Laurie Murray, Kerri Rooke, Stewart Rooke, Carol Tangedal, Tony Tangedal.

11. CHURCHBRIDGE B. *Dennis Petracek*.

12. CLARK'S CROSSING. Dale Booth, Dave Cook, Louise Cook, Lorne Duczek, Andrew Elgin, Shelly Fisher, Bob Godwin, Marilyn Haskins, Ron Jensen, Robert Johanson, Gwen Klypak, Heney Klypak, Blair McCann, Brian McGill, Eileen McGill, Diane Murphy, Lynn Oliphant, *John Patterson*, Sylvia Raginski, Nick Saunders, Jan Shadick, Stan Shadick, Rhonda Shewfelt, Laura Stewart, Marten Stoffel, Guy Wapple, Diane Wells, Michael Williams.

13. CRAVEN. Marla Anderson, Hiroyuki Aoki, Marj Bird, Joel Cherry, Blanche Cooper, Jim Cummings, Stephen Davis, Terry Ford, Jill Forester, *Chris Harris*, Louise Holloway, Phil Holloway, Andrew Huculak, Bonnie Huculak, Jones Irving, Kerri Irving, Fran Kerbs, Laurie Koepke, Andre Kroeger, Nick Kroeger, Jackie Kuikman, Loretta Lane, Bob Luterbach, Jeannette Luttmeyer, Kent Lynn, Barbara Mader, Juan Martinez, Amelia McDonald, Jaret McDonald, Bob McGill, Annie McLeod, Barry Mitschke, Curtis Pollock, Brett Quiring, Vera Raschke, Ed Rodger, Susan Rollins, Jacqueline Roy, Nick Selinger, Jeanette Taylor, Robb Taylor, Lorna Tyler, Chris Whitall, Mary Worel.

14. CROOKED LAKE. *Boyd Metzler*, Tony Saltasuk.

15. CROOKED RIVER. *Margaret Mehler*, Morley Mehler.

16. CYPRESS HILLS PROVINCIAL PARK (Centre Block). Dwight Dobson, Nancy Dobson, David Larson, Margarete Larson, Brynne Martin, Mimi Martin, Kevin Moore, *Melody Nagel-Hisey*.

17. DENHOLM. Beverly Beland, Gerard Beland, Linda Beland, *Orval Beland*.

18. DORINTOSH. Vicky Pryor, *Joe Twidale*, Lorraine Twidale, Tim Wahl.

19. DUNDURN. *Ron Jensen*, Nick Saunders, Phil Taylor, Guy Wapple, Don Weidl.

20. DUVAL. Merv Hey, *Lloyd Saul*.

21. E. B. CAMPBELL DAM. Bert Dalziel, Joan Dalziel, *Ryan Dudragne (non-participating compiler)*, Bill Weighill, Clara Weighill.

22. EASTEND. Loraine Armstrong, Roland Bear, Roxie Binkley, Duane Bristow, Betty Davis, Tom Donald, Cynthia Fehr, *Robert Gebhardt*, June Higgins, Joan Hodgson, Harvey Johnson, Katherine Myhr, Mary

Thomson, Heidi Topham, Eldon Wig, Jack Wilkinson, Jan Wilkinson.

23. EBENEZER B. Carol Wegner, *Harvey Wegner*.

24. ENDEAVOUR. *Norman Harris*.

25. ESTEVAN. Barry Dies, Marilyn Dies, Craig Palmer, Larry Preddy, Reid Walton, Rose Walton, *Guy Wapple*, Sandra Wapple.

26. ESTUARY NORTH. Barry Cocks, Cathy Cocks, *Dean Francis*.

27. FENTON. *Carman Dodge*.

28. FLORAL. Ryan Dudragne, *Guy Wapple*.

29. FORT QU'APPELLE. Jean Ashcroft, Peter Ashcroft, Linda Banman, Mark Geremia, Darryl Hamiltin, Alice Isfan, Jack Lowe, Marg Lowe, Jean McKenna, Alan Mlazgar, Wendy Paquin, *Keith Stephens*, Kim Stephens, Ted Stevenson, Colette Stushnoff.

30. GARDINER DAM. Ryan Dudragne, Andrew Elgin, Greg Fenty, Ron Jensen, Scott Olshanoski, Nick Saunders, Dan Sawatzky, Stan Shadick, Marten Stoffel, Phil Taylor, *Guy Wapple*.

31. GOOD SPIRIT LAKE. *Joyce Anaka*, Dorothy Riesz, Ray Riesz.

32. GRASSLANDS NATIONAL PARK. *Kevin Moore*, Vicki St. Germaine, Warren St. Germaine.

33. GRAYSON. Jack Carrigan, Carina Helm, *Charles Helm*, Daniel Helm, Linda Helm, Jeanette Zimmer, Karl Zimmer.

34. GRENPELL. Ethel Reiger, Barb Weidl, *Don Weidl*.

35. HARRIS. Ron Jensen, *Guy Wapple*, Rob Wapple.

36. HUDSON BAY. Roger Alain, *John Daisley*, Caleb Ekerty, Cash Ekert, Meredith Eikert, Alana Gelhorn, Agnes Lewellin, Abby Rawling, Nixon Rawlings, Dennis Reimer, Ruth Reimer, Gloria Stang, John Zolkavich.
37. INDIAN HEAD. Guy Blair, Ron Chambers, Kay Dixon, J. Dixon, *Irvin Escott*, David Gehl, Roberta Gehl, Ed Haid, Edith Haid, Jim Jinks, Linda Jinks, Dan Loran, H. Madeley, Dora Nichols, Jim Rudack, Ruth Rudack, Lorette Schaeffer, Raymond Schaeffer, Brian Scott, Glenn Scott, Lorne Scott Fred Skinner, C. Skinner.
38. KENASTON. Doug Beckie, *P. Lawrence Beckie*, Theresa Beckie, Patti Hertz.
39. KENOSEE LAKE. Boyd Metzler, *John Pollock*.
40. KITCHEN NORTH. *Dallas Fairburn*.
41. KINLOCH. *Don Forbes*, Carter Haroldson, Robert Haroldson, Darcy Swider, Doreen Wickstrom.
42. KYLE. Greg Nelson, Yvonne Nelson, Marten Stoffel, *Dan Zazelenchuk*.
43. KUTAWAGEN LAKE. *Val Harris*, Sheila Lamont
44. LAC LA PLONGE. Erin Conkin, John Conkin, *Katherine Conkin*.
45. LA RONGE. Alina Mack, Melanie Mack, Serenity Mack, Linda Mikolayenko, Sid Robinson, *John Schisler*, Jan Shewchuk.
46. LMLNWA. *Val Harris*, Sheila Lamont
47. LEROY. Brian Galka, *Lloyd Saul*.
48. LOVE - TORCH RIVER. *Bert Dalziel*, Joan Dalziel, Sara Dalziel, Scott Edwards, Andrea Fisher, Harold Fisher, Taren Fisher, Betty Isbister, Henry Isbister, Adrik Kurbis, Coulter Kurbis, Duane Kurbis, Renee Kurbis, Shawn Paschke, Josh Turlte, Leonard Turtle, Shelly Vallier.
49. LUSELAND. Estelle Finley, Graeme Finley, *Kim Finley*, Liam Finley, Valerie Finley, Brent Honeker.
50. MARTINEAU RIVER. Jan Shadick, Stan Shadick, Vicki St. Germaine, Warren St. Germaine.
51. MEADOW LAKE. *Bob Wilson*, Ian Wilson.
52. MELFORT. Kirsten Ballantyne, *Bert Dalziel*, Joan Dalziel, Gordon Dodds, Shirley Dodds, Susan Dodds, Graydon Eskowich, Kim Eskowich, Wendy Eskowich, Scott Green, Cerey Samida, Kirk Samida, Darleen Thompson.
53. MOOSE JAW. Joel Cherry, *Chris Harris*, Laurie Koepke, Bob Luterbach, *Jeff Mander*, Annie McLeod, Brett Quiring, Dan Sawatzky.
54. MOOSE MOUNTAIN. Bill Fletcher, Dorothy Fletcher, Doyle Thomas, *Val Thomas*.
55. MORSE. Elizabeth Enns, Noel Enns, Stella Enns, Mike Francis, Roxanne Hagle, Randy McCulloch, Joel Priebe, Ken Priebe, *Myrna Priebe*, Lori Wilson.
56. NICOLLE FLATS. *Dale Hjertaas*, Fran Kerbs, Mary Worel.
57. NIPAWIN. Carol Blenkin, Nancy Budd, Joyce Christiansen, *Rick Douslin*, Patti Gaertner, Jennette LeCuyer, George Lidster, Jeri McCleary, Peter McCleary, Doug Phillips, Shirley Phillips, Bill Walter, Elaine Walter.
58. NISBET FOREST, NORTHWEST. *Sandra Jewell*.
59. NISBET FOREST, WEST. *Kim Clark*, Kiri Clark, Shamara Clark, Suzanne Clark, Brody Holiski.
60. ODESSA. *Arden Curts*, Denise Curts, Denny Curts.
61. OUTLOOK. Randi Edmonds, Graham Thomson, *Alan Smith*.
62. PRINCE ALBERT. Jim Bahr, Doug Braaten, Marie Braaten, David Britton, Kim Clark, Shamara Clark, Bert Dalziel, Joan Dalziel, *Carman Dodge*, Andrea Fisher, Harold Fisher, Taren Fisher, Ham Greenwood, Sandra Jewell, Gwen Klebek, Collin McGuire, Sonnet McGuire, Christine Rye, John Rye, Vicki St. Germaine, Warren St. Germaine, Rhonda Warrener, Don Weidl.
63. PIKE LAKE. Donna Bruce, Dave Cook, Louise Cook, Yvonne Cuttle, Lorne Duczek, Ryan Dudragne, Andrew Elgin, Matthew Frey, Bob Girvan, Bob Godwin, Greg Hutchings, Audrey MacKenzie, Bill MacKenzie, Janine McManus, Joe Monahan, Murray Morgan, *John Patterson*, Mark Sabourin, Nick Saunders, Nicola Schaefer, Jan Shadick, Stan Shadick, Joe Stookey, Louisa Stuglin, Stephan Stuglin, Phil Taylor, Guy Wapple, Adrian Werner, Michael Williams, Natalia Wycislak.
64. QU'APPELLE. Jean Ashcroft, Peter Ashcroft, Melanie Beattie, Carlie Bennett, Cory Bennett, Stacy Bennett, Christine Blair, Paul Paulhus, *Colette Stushnoff*, Richard Stushnoff, Frank Veresh.
65. QU'APPELLE VALLEY DAM. Ryan Dudragne, Andrew Elgin, Robert Johanson, Nick Saunders, Jan Shadick, Stan Shadick, Carl Siemens, Hollyce Siemens, Marten Stoffel, Guy Wapple, *Michael Williams*.
66. RAYMORE. *Val Harris*, Sheila Lamont.
67. REGINA. Ingrid Alesich, Marla Anderson, Brian Armstrong, Arleen Arnold, Sameer Bhuyan, Joanne Bonneville, Lionel Bonneville, Stephane Bonneville, Stephane Canevet, Janet Canwood, Lolamae Crawley, Ron Crawley, Al Cullen, Jim Cummings, Elaine Ehmann, Jaquie Fauth, Phyl Fauth, Mary Fields, Ryan Fisher, Terry Ford, Brendan Graham, Chris Harris, JoAnne Harrison, Zach Harrison, Trevor Herriot, Dale Hjertaas, Myrna Hunter, Marie James, Fran Kerbs, Lucille Lipka, Sarah Ludlow, Bob Luterbach, Laurie Koepke, Andre Kroeger, Maureen Lee, Lauren Mang, Kim Mann, Val Mann, Wayne Pepper, Joseph Poissant, *Brett Quiring*, Chris Ratch, Ed Rodger, Dan Sawatzky, Gary Seib, Nick Selinger, Margaret Skeel, Brian Sterenberg, Frank Switzer, Mary Switzer, Hanna Walczykowski, Lorraine Weidner.
68. ROSCOMMON S.D. Bernice Althouse, Kate Althouse, Ruby Finnie, Brian Irving, Sophie Jankowski, Joan Lillibo, *Dianne Sloan*, Graham Sloan, Marguerite Sloan.
69. ROULEAU. Stuart Anderson, *Patricia Sterzuk*.
70. ROUND LAKE (Prince Albert Area) *Crystal Frenette*.
71. ROUND LAKE (Qu'Appelle Valley). *Boyd Metzler*, Tony Saltasuk, Mary Ward, Pat Ward.
72. SALTCOATS. *Arden Bradford*, Olga Brygider, Len Cameron, Muriel Cameron, Walter Farquharson, John Farquharson, Dave Herron, Gloria Herron, Gerri Knudsen, Ron Knudsen, Fern McKay, Earl Upshall, Verda Upshall, Joan Wilson, Rob Wilson.
73. SASKATCHEWAN LANDING PROVINCIAL PARK. Marten Stoffel, *Dan Zazelenchuk*.
74. SASKATCHEWAN RIVER FORKS. Carman Dodge, *Don Weidl*.
75. SASKATOON. Joanne Adams, Vanessa Amy, Nick Belliveau, Ryan Bradshaw, Anne Brander, Jacquie Christenson, Yvonne Cuttle, Lorne Duczek, Joan Feather, Greg Fenty, Jennifer Fenty, David Forbes, Albert Gerard, Martin Gerard, Denise Giroux, Keith Giroux, Kyron Giroux, Mike Gollop, Jacob Henderson, Lorie Henderson, Terri Jackson, Ron Jensen, Shan Landry, Anna Leighton, Janet Loran, Audrey MacKenzie, Bill MacKenzie, Jane McPhee, Coleen Meldrum, Scott Mitchell, Kelley Moore, Jonathan Moore-Wright, Verity Moore-Wright, Hilda Noton, Jim Paul, *John Patterson*, Diane Rogers, Marc Sabourin, Monica Sallas, Dick Santo, Trish Santo, Scott Saretsky, Nick Saunders, Andrew Schaaan, Jan Shadick, *Stan Shadick*, Coy Sharp, Barb Springings, Marten Stoffel, Lenore Swystun, Margo Taylor, Phil Taylor, Don Torrie, Guy Wapple, Cathy Watts, Hamish Watts, Trent Watts, George West, Helen Wilkins, Michael Williams, Dan Zazelenchuk, Norman Zlotkin.
76. SAWYER LAKE. Maureen Blight, *David Weiman*.
77. SHAMROCK. Alfred Arnold, Wendy Arnold, *Hugh Henry*, Iris McNeill, Joel Priebe, Myrna Priebe, Clinton Rud.
78. SHELL LAKE. *Ryan Dudragne*, Kelly Fairbrother, Carole Martin, Andie Mazur, Kyra Mazur, Beckett Stark, Kay Willson, Phil Willson.
79. SWIFT CURRENT. Jacquie Bolton, Stacy Bolton, Norris Currie, Gordon Dowie, Laurent Dudragne, Mary Ann Dudragne, *Arnie Ens*, Dave Green, Esther Green, Norma Hain, Hugh Henry, Leonard Howes, Lois Howes, Michelle Hubbard, Ken Knudson, Nicole Kuyek, Connie Lendrum, Dot Letkeman, Robert Moroz, Arden Pierce, Irene Stinson.
80. THICKWOOD HILLS-SPIRITWOOD. Giles Lalonde, Dawn Mundell, Carole Martins, Kay Willson, *Philip Willson*.
81. TURTLE LAKE. *David Forbes*, Reg Forbes, Fred Hegelton, Jackie Hegelton, Brent Keen, Cheryl Robbins.
82. TURTLEFORD. Hank deGraaf, Miles Johnson, *Brent Keen*, Louise Lundberg, Ron Perkins, Richard Roney, Margaret Uhlig.
83. WEYBURN. Bob Cameron, Lucille Cameron, Darcy Dyck, Al Fahlman, Jo-Ann Fahlman, Glen Fleming, Millie Fleming, Dale Huff, Sandy Huff, Alma McCormick, Morley McCormick, Charlotte Payak, Cole Payak, Don Payak, Janice Phillips, Garnet Schultz, Lina Schultz, Doyle Thomas, Tanis Thomas, *Val Thomas*, Kim Thorson, Myrt Thorson, Dorothy Whitell, John Whitell.
84. WHITE BEAR. *Dan Zazelenchuk*.
85. WHITEWOOD. Ken Aldous, Carole Armstrong, Cindy Ashfield, Joe Ashfield, Paul Ashfield, Kerri Bachtold, Joyce Kydd, Sarah Mambourg, *Boyd Metzler*, Harry Mitchell, Marilyn Mitchell, Donna Mohr, Margaret Niemenen, Paul Niemenen, Tony Saltasuk, Doug Shepherd, Dawn Vennard, Diane Veresh, Pat Ward.
86. WINGARD. *Rebecca Beam*.

TABLE 1. Weather and Snow Cover.

LOCALITY	DATE	MIN TEMP (°C)	MAX TEMP (°C)	MIN WIND (KM/HR)	MAX WIND (KM/HR)	MIN SMOW (CM)	MAX SNOW (CM)	SKY A.M.	SKY P.M.
Archerwill	28 Dec 2018	-20	-18	10	17	8	8	partly cloudy	partly cloudy
Avonlea	2 Jan 2019	-8	-6	0	20	0	10	partly cloudy	cloudy
Balgonie	5 Jan 2019	-8	-4	20	40	5	5	overcast	partly cloudy
Biggar	20 Dec 2018	-8	-4	5	13	0	10	overcast	partly cloudy
Birch Hills	4 Jan 2019	-5	-2	2	5	4	30	partly cloudy	partly cloudy
Borden-Radisson	21 Dec 2018	-3	3	10	52				
Broadview	28 Dec 2018	-23	-17	5	10	4	6	clear	mostly clear
Candle Lake	5 Jan 2019	-14	-13	1	5	15	30	overcast	light snow
Cater	3 Jan 2019	-4	0	0	8	10	20	partly cloudy	clear
Chatsworth S.D.	4 Jan 2019	-8	2	1	1	2	16	partly cloudy	partly cloudy
Churchbridge B	5 Jan 2019							overcast	overcast
Clark's Crossing	15 Dec 2018	1	4	22	40	0	15	partly cloudy	mostly clear
Craven	15 Dec 2018	-2	3	19	33	0	6	overcast	mostly clear
Crooked Lake	2 Jan 2019	-3	-1	10	20	2	15	cloudy	partly cloudy
Crooked River	27 Dec 2018	-20		2	11			mostly clear	mostly clear
Cypress Hills P.P.	28 Dec 2018	-8	-5	2	5	5	10	mostly clear	mostly clear
Denholm	25 Dec 2018	-16	-12	0	6	4	10	partly cloudy	partly cloudy
Dorintosh	22 Dec 2018	-9	-3	2	5	20	30	mod. snow	light snow
Dundurn	22 Dec 2018	-9	-5	28	38	0	10	overcast	light snow
Duval	26 Dec 2018	-14	-7	0	10	0	22	clear	partly cloudy
E.B.Campbell Dam	3 Jan 2019	0	3	10	25	25	10	cloudy	partly cloudy
Eastend	3 Jan 2019	1	1	15	40	0	10	partly cloudy	partly cloudy
Ebenezer B	29 Dec 2018	-10	-5	10	15	6	12	cloudy	cloudy
Endeavour	28 Dec 2018	-14	-8	2	5			cloudy	cloudy
Estevan	30 Dec 2018	-13	-10	22	30	5	15	light snow	light snow
Estuary North	27 Dec 2018	-12	-13	10	30	0	0	overcast	light snow
Fenton	4 Jan 2019	-4	-10					mostly clear	mostly clear
Floral	14 Dec 2018	-6	4	16	25	0	5	mostly clear	partly cloudy
Fort Qu'Appelle	14 Dec 2018	0	2	2	2	0	2	clear	clear
Gardiner Dam	17 Dec 2018	-6	-4	10	18	0	10	partly cloudy	partly cloudy
Good Spirit Lake	4 Jan 2019	1	3	15	20	5	25	partly cloudy	mostly clear
Grasslands N.P.	19 Dec 2018	-2	0	2	5	1	5	mostly clear	mostly clear
Grayson	27 Dec 2018	-12	-10	0	10	0	10	light snow	light snow
Grenfell	5 Jan 2019	-5	-4	0	5	2	5	light fog	mostly clear
Harris	19 Dec 2018							mostly clear	mostly clear
Hudson Bay	29 Dec 2018	-18	-15	15	20	25	30	cloudy	
Indian Head	27 Dec 2018	-24	-15	5	10	8	8	clear	partly cloudy
Kenaston	15 Dec 2018	1	3	5	20	1	4	partly cloudy	clear
Kenosee Lake	27 Dec 2018	-13	-11	6	25	5	15	light snow	overcast
Ketchen North	26 Dec 2018	-14	-12	0	10	12	16	overcast	cloudy
Kinloch	27 Dec 2018	-18	-10	15	20	23	26	partly cloudy	overcast
Kutawagen Lake	4 Jan 2019	-6	-3	10	30	0	10	partly cloudy	partly cloudy
Kyle	29 Dec 2018	-11	-4	0	2	0	2	clear	overcast
Lac La Plonge	28 Dec 2018	-15	-14	0	5	25	50	overcast	mod. snow
La Ronge	2 Jan 2019	-14	-11	30	39	22	25	cloudy	partly cloudy

LOCALITY	DATE	MIN TEMP (°C)	MAX TEMP (°C)	MIN WIND (KM/HR)	MAX WIND (KM/HR)	MIN SMOW (CM)	MAX SNOW (CM)	SKY A.M.	SKY P.M.
LMLNWA	5 Jan 2019	-10	-3	8	10	0	10	overcast	overcast
Leroy	5 Jan 2019	-10	-8	0	5	0	17	light fog	overcast
Love-Torch River	26 Dec 2018	-25	-12	0	5			overcast	overcast
Luseland	22 Dec 2018	-7	-4	20	29	2	6	cloudy	cloudy
Martineau River	21 Dec 2018	-3	-2	21	31	4	6	light snow	mod. snow
Meadow Lake	26 Dec 2018	-12	-10	20	40	10	20	cloudy	light snow
Melfort	22 Dec 2018	-30	-26	13	26			clear	clear
Moose Jaw	22 Dec 2018	-5	-5	15	44	0	5	overcast	overcast
Moose Mountain	29 Dec 2018	-14	-7	2	4	4	10	partly cloudy	partly cloudy
Morse	16 Dec 2018	-10	-3	10	20	0	30	overcast	partly cloudy
Nicolle Flats	19 Dec 2018	-1	3	5	25	0	6	partly cloudy	mostly clear
Nipawin	26 Dec 2018	-16	-11	0	5	15	15	cloudy	cloudy
Nisbet Forest NW	26 Dec 2018	-16	-7	2	6	9		light fog	light snow
Nisbet Forest West	29 Dec 2018	-16	-16	10	20	20	20	overcast	overcast
Odessa	29 Dec 2018	-10	-4	10	15	4	10	overcast	partly cloudy
Outlook	26 Dec 2018	-10	-8	0	10	0	5	partly cloudy	partly cloudy
Pike Lake	5 Jan 2019	-7	0	10	24	2	15	partly cloudy	cloudy
Prince Albert	16 Dec 2018	-15	-15	5	6	4	10	overcast	overcast
Qu'Appelle	28 Dec 2018	-24	-12	10	25	5	10	clear	light snow
Qu'Appelle Dam	16 Dec 2018	-11	-6	0	15	0	10	cloudy	partly cloudy
Raymore	25 Dec 2018	-13	-10	6	11	0	15	light snow	light snow
Regina	29 Dec 2018	-11	-5	2	15	5	10	mostly clear	mostly clear
Roscommon S.D.	2 Jan 2019	-8	-1	10	15	26	31	overcast	overcast
Rouleau	17 Dec 2018	-5	2	20	29	1	2	partly cloudy	cloudy
Round Lake (P.A.)	5 Jan 2019	-8		10	15	10	20	overcast	light snow
Round Lake (Q.V.)	17 Dec 2018	-10	-5	12	25	0	12	overcast	overcast
Saltcoats	18 Dec 2018	-7	-1	12	17	3	5	clear	clear
Sask. Landing P.P.	20 Dec 2018	-7	1	0	20	0	2	clear	partly cloudy
Sask. River Forks	15 Dec 2018	3	2	5	10	5	10	mostly clear	clear
Saskatoon	26 Dec 2018	-12	-9	2	7	2	15	partly cloudy	partly cloudy
Sawyer Lake	24 Dec 2018	-14	-12	10	20	10	15	light snow	
Shamrock	19 Dec 2018	-2	2	30	45	2	20	cloudy	mostly clear
Shell Lake	18 Dec 2018	-11	-1	0	17	2	15	partly cloudy	partly cloudy
Swift Current	15 Dec 2018	3	4	35	65	5	20	partly cloudy	mostly clear
Thickwood-Spiritwood	21 Dec 2018	-2	2	10	40	0	4	cloudy	overcast
Turtle Lake	27 Dec 2018	-23	-20	5	12	10	40	clear	overcast
Turtleford	28 Dec 2018	-12	-8	0	5	5	10	cloudy	cloudy
Weyburn	15 Dec 2018	0	3	5	8	4	6	clear	partly cloudy
White Bear	2 Jan 2019	-1	4	15	25	8	2	overcast	overcast
Whitewood	29 Dec 2018	-15	-6	5	20	5	20	overcast	overcast
Wingard	2 Jan 2019								
White Bear	21 Dec 2017	-12	-7	12	19	0	1	cloudy	overcast
Whitewood	27 Dec 2017	-31	-20	20	39	4	10	overcast	partly cloudy
Wingard	3 Jan 2018								

TABLE 2. Effort and Habitat Coverage (%). Wild Fruit: p=poor, f=fair, g=good, e=excellent.

LOCALITY	PARTICIPANTS	KM ON FOOT	HOURS ON FOOT	KM BY VEHICLE	HOURS BY VEHICLE	HOURS AT FEEDERS	EVERGREEN FOREST	MIXEDWOOD FOREST	DECIDUOUS FOREST	ASPEN GROVE/FARMLAND	ASPEN GROVE/PRAIRIE	NATIVE PRAIRIE	TAME PASTURE	FARMLAND	FARMSTEADS	URBAN	OPEN WATER	RIPARIAN	SHIELD, BOG, SWAMP	WILD FRUIT CROP	
Archerwill	10	0.5	0.5	0	0.0	8.0		25						50	25						p
Avonlea	2	0.0	0.0	141	6.0	1.3			5			5	5	25	5	50		5			f
Balgonie	19	36.0	12.5	492	19.5	0.0				20				45	10	25					p
Biggar	9	7.0	5.8	264	11.0	7.0				15				40	10	35					f
Birch Hills	2	0.5	0.5	51	5.5	1.0				20			10	45	5			20			f
Borden-Radisson	6	14.0	7.0	236	6.5	0.0															
Broadview	3	1.5	1.0	136	5.5	2.0			20	25		5	10	25	5	10					p
Candle Lake	4	6.0	1.5	124	8.2	0.0		70							25				5		f
Cater	3	0.0	0.0	224	8.0	1.0	5	10	5	15			5	50	5	5					g
Chatsworth S.D.	12	2.0	8.0	98	6.0	5.0				80		10	5		5						p
Churchbridge B	1					8.0										100					p
Clark's Crossing	29	15.0	13.3	600	29.4	5.5				30	5			20	15	20		10			f
Craven	45	29.8	15.2	609	23.9	13.5				25	15	5	4	20	10	20					f
Crooked Lake	2	0.0	0.0	131	5.0	0.0				10	15			40	5	20	10				f
Crooked River	2	0.0	0.0	15	1.0	0.0		40						40	20						f
Cypress Hills P.P.	8	8.0	5.0	15	1.0	0.0	40	40	8			10			2						g
Denholm	4	0.0	0.0	224	6.5	1.0				10	5		5	70	5	5					e
Dorintosh	4	8.0	3.0	32	1.0	0.7		60							40						f
Dundurn	4	4.0	2.0	136	4.3	0.0				30				60		10					g
Duval	2	2.0	1.0	107	6.8	0.3				20	5			35	10	30					g
E.B.Campbell Dam	4	2.0	1.0	92	4.5	2.0		70							10		20				p
Eastend	17	20.0	10.0	200	30.0	0.0		5		20	50		5	5		15	<1				g
Ebenezer B	2	0.0	0.0	28	4.0	3.0		5				50	30	10		5					p
Endeavour	1	0.0	0.0	15	2.0	4.0				40					60						f
Estevan	8	2.5	2.3	196	6.8	5.0								40	10	20	15	15			f
Estuary North	3		3.0		15.0	3.0			30			30		30	10						e
Fenton	1	0.0	0.0	80	3.3	0.0			10			20	20	40	10						g
Floral	2	4.0	3.8	203	5.3	0.0				15				50	10	25					f
Fort Qu'Appelle	15	0.0	0.0	287	16.0	0.0				25	20		10	20	5	20					p
Gardiner Dam	11	12.0	10.8	381	17.0	0.0				5				50	10	10	25				f
Good Spirit Lake	3	0.0	0.0	124	6.0	0.0				20			20	30	5	25					p
Grasslands N.P.	3	2.5	1.0	281	21.0	0.0						85	10			5					f
Grayson	7	14.0	3.0	99	4.0	4.0				35	5			25	10	15	5	5			f
Grenfell	3	0.0	0.0	117	4.5	2.5				15	15		5	15	25	10	15				p
Harris	4	4.0	4.0	271	10.3	0.0				5				70	5	20					f
Hudson Bay	14	2.0	0.5	20	1.5	10.0		40		40						20					g
Indian Head	22		2.0	418	10.0	17.0	5			10				75	5	5					p
Kenaston	3	0.0	0.0	216	6.0	0.0								90	5	5					
Kenosee Lake	2		0.5	143	4.0	0.5				20	10	5	5			50					f
Ketchen North	1	1.0	1.0	50	2.5	6.0				30			20	20	20	10					
Kinloch	5	2.0	1.0	128	7.0	9.0	5	30	20	30					15						p
Kutawagen Lake	2	0.5	0.3	147	5.7	0.7				10	5	5		60	10	10					g
Kyle	4	5.0	3.0	294	12.0	0.0						15	5	30	20	15		15			f
Lac La Plonge	3	2.0	1.0	40	4.0	0.5	25	35	25							15					g
La Ronge	7	3.0	4.5	68	6.0	2.5		20								70		10			g

LOCALITY	PARTICIPANTS	KM ON FOOT	HOURS ON FOOT	KM BY VEHICLE	HOURS BY VEHICLE	HOURS AT FEEDERS	EVERGREEN FOREST	MIXEDWOOD FOREST	DECIDUOUS FOREST	ASPEN GROVE/FARMLAND	ASPEN GROVE/PRAIRIE	NATIVE PRAIRIE	TAME PASTURE	FARMLAND	FARMSTEADS	URBAN	OPEN WATER	RIPARIAN	SHIELD, BOG, SWAMP	WILD FRUIT CROP	
LMLNWA	2	0.5	0.5	175.2	7.8	1.0				10		10		40	10	25	5				e
Leroy	2	2.0	1.0	149	6.0	0.5				15				35	15	35					f
Love-Torch River	20	4.8	4.3	411	22.0	14.0	20	10		50					10	10					p
Luseland	6	13.0	6.0	337	7.0	3.0				50		5	5	25	5	10					g
Martineau River	4	0.0	0.0	45	6.8	0.0		95		50								5			g
Meadow Lake	2	5.0	1.0	125	3.3	0.0		50						40		10					g
Melfort	13	0.0	0.0	194	7.8	16.8				5				45		50					f
Moose Jaw	8	23.3	8.6	337	13.0	0.0		10					5	45		30		10			g
Moose Mountain	4	0.0	0.0	110	5.0	3.0		55				5		25	5	10					g
Morse	10	3.7	1.5	494	21.5	0.5							5	90	5						g
Nicollie Flats	3	13.6	4.0	210	11.3	0.0			30			10	20	30		5		5			g
Nipawin	14	1.0	0.8	163	5.8	8.0	15	5		15				25	10	30					p
Nisbet Forest NW	1	1.0	0.8	0	0.0	3.2		50							50						
Nisbet Forest West	5	0.5	1.0	100	7.0	6.0	20		20	10				40		10					f
Odessa	3		2.0		8.0	4.0				20		20	20	20	20						f
Outlook	3	0.0	0.0	170	5.5	1.0						5		45	5	40	5				e
Pike Lake	30	23.0	23.7	393	21.2	3.0			10	45	5			20	15	5					p
Prince Albert	23	24.5	12.3	420	26.1	4.0															g
Qu'Appelle	11	2.5	0.8	316	11.2	17.0				60	5		5	20	5	5					p
Qu'Appelle Dam	11	8.0	8.5	548	20.0	0.0				30	10			20	10	15	5	10			f
Raymore	2	0.5	0.5	131	7.8	1.0				25			5	35	10	25					g
Regina	52	109.5	42.3	445	20.5	11.5				10				25	5	60					p
Roscommon S.D.	9	0.0	0.0	84	3.0	24.0				20				60	20						p
Rouleau	2	0.0	0.0	231	6.4	1.0						5		80	5	10					p
Round Lake (P.A.)	1	1.0	2.0	0	0.0	5.5		25					25	40				10			p
Round Lake (Q.V.)	4	0.0	0.0	253	5.5	1.0				15				40	10	25	10				
Saltcoats	15	0.0	0.0	60	8.0	10.0				55		10			20	15					p
Sask. Landing P.P.	2	5.0	2.0	299	7.0	0.0				5			10	35	20	5		25			f
Sask. River Forks	2	2.0	1.0	83	5.3	0.0	15	20	20	15			5	15	5		5				p
Saskatoon	61	89.0	46.3	772	47.2	15.9				10				5		70	5	10			p
Sawyer Lake	2	6.0	4.0	21	4.0	0.0		50		10			20		10			10			f
Shamrock	7	4.0	3.0	391	13.5	1.0						5	15	60	15	5					
Shell Lake	8	2.5	2.5	225	8	0	5	<1	25	5	5	5	30	15	<1	5		5			f
Swift Current	22	29.0	13.5	469	27.0	6.8								20	5	70		5			f
Thickwood-Spiritwood	5	3.0	1.5	147	6.0	2.5	5	10		25			10	30	5	10			5		f
Turtle Lake	6	4.0	2.5	45	2.0	0.0	20	40						40							f
Turtleford	7	12.0	3.0	410	7.0	7.0				45				50		5					f
Weyburn	24	0.0	0.0	320	15.0	9.0			5		5	5	5	60	10	10					f
White Bear	1	2.0	1.0	277	7.0	0.0						5	5	65	20			5			f
Whitewood	22	2.5	3.0	494	14.0	37.0				5				15	5	75					f
Wingard	1																				

TABLE 3. Species found on 6 or more counts; () = seen during count period (CP); CP totals include CP birds listed in Table 4.

SPECIES	ARCHERWILL 27 DEC 2018	AVONLEA 2 JAN 2019	BALGONIE 5 JAN 2019	BIGGAR 20 DEC 2018	BIRCH HILLS 4 JAN 2019	BORDEN - RADISSON 21 DEC 2018	BROADVIEW 28 DEC 2018	CANDLE LAKE 5 JAN 2019	CATER 3 JAN 2019	CHATSWORTH 4 JAN 2019	CHURCHBRIDGE B 5 JAN 2019	CLARK'S CROSSING 15 DEC 2018	CRAVEN 15 DEC 2018	CROOKED LAKE 2 JAN 2019	CROOKED RIVER 27 DEC 2018	CYPRESS HILLS P.P. 28 DEC 2018	DENHOLM 25 DEC 2018	DORINTOSH 22 DEC 2018	DUNDURN 22 DEC 2018	DUVAL 23 DEC 2018	E. B. CAMPBELL DAM 3 JAN 2019	EASTEND 3 JAN 2019	EBENEZER B 5 JAN 2019	ENDEAVOUR 23 DEC 2018	
Canada Goose												483		1					54		8			1	
Mallard												2		4											
Common Goldeneye												242		1								313			
Gray Partridge		7	40			28	6		6			94	12				7		6	(8)				13	
Ring-necked Pheasant			1														1						3		
Ruffed Grouse	(1)						(1)	3	4	3	3		1		3	1	1	(1)			1			4	
Sharp-tailed Grouse	(5)		58	51		10	6					48	18				1		5		1			1	
Rock Pigeon		11	317	172	16	96	8		75	22		610	230	15			91			59	10	7		50	
Eurasian Collared-Dove		2	19	15		2	14					8					2		22	1		38			
Bald Eagle	(1)					4	(1)					2	1						1		5			1	
Northern Goshawk																			1				2		
Golden Eagle		(1)																				2			
Great Horned Owl	(1)	2	1	2						2		4	1				(1)		1	2		3		1	
Snowy Owl					1							2					4	(2)		1		1			
Long-eared Owl																									
Downy Woodpecker	1	(1)	6	9	3	5	2	4	2	9	3	17	21	2	1	1	4	3	4	1	1	6	1	4	
Hairy Woodpecker	3		5	6	2	3	3	6	1	7	4	15	8	3	3	1	3	2	1	2	1	2		3	
Black-backed Woodpecker								1																	
Northern Flicker		(1)	1	1								1	(1)	1								7			
Pileated Woodpecker	(1)							2	1						(1)		(1)	1			2			1	
Merlin			1									1													
Prairie Falcon																									
Northern Shrike												2	1							1			1		
Canada Jay								2											3		7			5	
Blue Jay	11	1	15	5	3	8		19	3	5		17	36	4	5	2		7	1		11	8	2		
Black-billed Magpie	5		190	141	17	68	27	10	26	14		255	201	27	4	12	46		64	29	16	74	41		
American Crow						1							1												
Common Raven	4	5	109	35	13	95	21	115	76	30	3	243	85	12	4	4	14		8	15	31	9	40	1	
Horned Lark		40	2			(13)						3					(2)					100			
Black-capped Chickadee	30		77	49	21	38	18	125	16	43	32	196	204	48	7	43	13	20	59	28	8	26	12	10	
Boreal Chickadee	1							26	1												4				
Red-breasted Nuthatch	1	2	14	23		4	3	35		8	3	17	7	1	2	5		1	8	2	8	27			
White-breasted Nuthatch	3	1		3	3		2	5	1			7	31		2	1	1	2						2	
Brown Creeper			1			3														2				3	
Golden-crowned Kinglet				2		1		1												2					
American Robin			4				2					7	6				2			1				4	
European Starling		3	7		9		16					160	21	12		5		(30)				11		20	
Bohemian Waxwing				22	86	100											7								
Cedar Waxwing	(6)			1									10												
House Sparrow		119	728	604	43	333	90		13	144	5	1523	735	22		24	153		290	203	4	148	17	6	
Evening Grosbeak	16							10	12							14					13			35	
Pine Grosbeak	6							17	13							8					1			1	
House Finch		2	1	23			(1)					91	3						2	2					
Purple Finch		(1)																							
Common Redpoll	59		3	12	6	22	70	1	16	27	16	121	56			8		10	2	2		21		4	
Hoary Redpoll	6			1												7		(2)			1				
White-winged Crossbill								39											7			12			
Pine Siskin			28	12			(1)					15							3			20			
American Goldfinch												5										6			
Snow Bunting	(20)			27		314	110		5	16		571					389	(30)	378			123	155	30	
White-throated Sparrow																									
Dark-eyed Junco		1	4	3		3			1	1		3	10									7			
Red-winged Blackbird												(1)													
Common Grackle																									
TOTAL BIRDS COUNT DAY	146	197	1633	1219	223	1144	398	426	272	332	69	4756	1712	155	68	102	746	74	922	346	476	653	268	200	
TOTAL BIRDS ONLY IN CP	34	5	0	0	0	0	18	0	0	0	0	1	1	0	1	0	6	63	0	8	0	0	0	0	0
TOTAL SPECIES COUNT DAY	13	14	25	23	13	23	16	20	18	15	8	31	25	16	13	13	16	11	23	13	23	28	7	22	
TOTAL SPECIES ONLY IN CP	6	5	0	0	0	0	6	0	0	0	0	1	1	0	1	0	4	4	0	1	0	0	0	0	0

SPECIES	ESTEVAN 30 DEC 2018	ESTUARY NORTH 27 DEC 2018	FENTON 4 JAN 2019	FLORAL 14 DEC 2018	FORT OUELLETTE 14 DEC 2018	GARDNER DAM 17 DEC 2018	GOOD SPIRIT LAKE 4 JAN 2019	GRASSLANDS N.P. 12 DEC 2018	GRAYSON 27 DEC 2018	GRENFELL 5 JAN 2019	HARRIS 19 DEC 2018	HUDSON BAY 29C 2018	INDIAN HEAD 27 DEC 2018	KENASTON 15 DEC 2018	KENOSSEE LAKE 27 DEC 2018	KETCHEN 26 DEC 2018	KINLOCH 27 DEC 2019	KUTAWAGAN LAKE 4 JAN 2019	KYLE 29 DEC 2018	LAC LA PLOUGE 28 DEC 2018	LA RONCE 22 DEC 2018	LMINWA 5 JAN 2019	LEROY 5 JAN 2019	LOVE-TORCH RIVER 26 DEC 2018	
Canada Goose	12575					10843			1																
Mallard	4775					850			4				32												
Common Goldeneye	11					1	137						3												
Gray Partridge				4	21				(6)		31		11	40				11	30			9		10	
Ring-necked Pheasant	91	41						11																	
Ruffed Grouse					(1)			(1)			(1)	2		1	6						1			4	
Sharp-tailed Grouse	1	12		1	12			11	(2)	13	13		52	17						4		11		10	
Rock Pigeon	25		10	337	164	65	23	3	15	15	155		126	10		1	2	9	206			7	33	136	
Eurasian Collared-Dove	12			2	14	6		15	12	5			2							36		2			
Bald Eagle	3	1			(1)	46			1				2		(2)	(1)				1				2	
Northern Goshawk		1			(1)	1						(1)	1									1		1	
Golden Eagle	1					1		4																	
Great Horned Owl	(1)	2		1		5		3	1		5		4	1					4	10		1		1	
Snowy Owl		1				1		2			3		1	1						4				2	
Long-eared Owl																									
Downy Woodpecker	8	2		5	14	2	1		2	1	4	7	18		5	3	8	4	2		12	3	2	19	
Hairy Woodpecker	6	4		2	9	4	2		2	1	1	11	17	(1)	8	3	1			(1)	4			12	
Black-backed Woodpecker												(1)												1	
Northern Flicker	1				(1)																				
Pileated Woodpecker	1	1										(1)			(1)									2	
Merlin	1																								
Prairie Falcon																									
Northern Shrike																									
Canada Jay																									
Blue Jay	3	12	3	3	24	19	7	1	1		6	58	34	(2)	46	5	20		11		4	12		14	
Black-billed Magpie	3	44	29	72	96	127	25	21	26	25	141	5	47	14	11	22	46	25	87	6	8	2			

TABLE 3. Species found on 6 or more counts; () = seen during count period (CP); CP totals include CP birds listed in Table 4.

SPECIES	LUSELAND 22 DEC 2019	MARTINEAU RIVER 21 DEC 2018	MEADOW LAKE 26 DEC 2018	MELFORT 22 DEC 2018	MOOSE JAW 22 DEC 2018	MOOSE MOUNTAIN P.P. 29 DEC 2018	MORSE 16 DEC 2018	NICOLLE FLATS 19 DEC 2018	NIPAWIN 26 DEC 2018	NISBET FOREST NW 26 DEC 2018	NISBET FOREST WEST 29 DEC 2018	ODESSA 29 DEC 2018	OUTLOOK 26 DEC 2018	PIKE LAKE 5 JAN 2019	PRINCE ALBERT 16 DEC 2018	QU'APPELLE 28 DEC 2018	QU'APPELLE DAM 16 DEC 2018	RAYMOR 25 DEC 2019	REGINA 29 DEC 2018	ROSCOMMON S.D. 2 JAN 2019	ROULEAU 17 DEC 2018	ROUND LAKE (P.A.) 5 JAN 2019	ROUND LAKE (Q.V.) 17 DEC 2018	SALCOATS 18 DEC 2018
Canada Goose						(70)							(67)			1119	65						2	
Mallard		9														7	135						10	
Common Goldeneye		3											2			322	(1)							
Gray Partridge	75						217	57				15			11	12	10	120		(12)		7	10	
Ring-necked Pheasant					1		3																	
Ruffed Grouse		3				2			1	(1)	5	2		1	1	4								3
Sharp-tailed Grouse	9						35	16				20		52		64	5		2					
Rock Pigeon	75		5	19	512	2	167	48	170		55	10	18	136	344	69	21	56	1249	(71)	148		13	20
Eurasian Collared-Dove	11			3	112		21						17		1	3		4						6
Bald Eagle						(1)						4		3		12							2	6
Northern Goshawk													1											
Golden Eagle													1											1
Great Horned Owl	6				4	1	17	3			(1)	2		4		(1)	6	(1)	7	(1)	3			
Snowy Owl	4			(2)	9		7				1	2							16	(1)	12			
Long-eared Owl																	1							
Downy Woodpecker	(1)			1	7	3	4	3	6	2	2	4		28	13	17	7	1	37	8			6	14
Hairy Woodpecker	1	1		2	7	1	1	1	5	2	3	4		19	6	12	6	1	4	17		1	5	14
Black-backed Woodpecker			1												(2)				1					
Northern Flicker	(1)							1							3		2		10					
Pileated Woodpecker						1						2		5		1								
Merlin					1													2						
Prairie Falcon																1		1						
Northern Shrike						3							(1)		1			2					1	
Canada Jay		10							(1)						9									
Blue Jay	5	20		1	3	9	2	3	33	3	14		5	28	42		10		12	12		2	12	17
Black-billed Magpie	105	2	15	41	66	10	41	28	15	2	13	20	97	144	133	96	73	30	90	47	8		24	6
American Crow					1																			
Common Raven	11	29	30	82	21	6	8	32	88	5	11	10	4	69	202	38	22	41	215	36	17	2	16	52
Horned Lark	58				3		83	1							2		17						2	
Black-capped Chickadee	3	28	6	34	37	40		12	61	36	31	20	4	409	230	67	54	21	251	54		12	11	94
Boreal Chickadee		17													4									
Red-breasted Nuthatch	7	10		10	14	2	15		18	1		4	1	12	14	2	5	1	178	2		1	1	2
White-breasted Nuthatch	1	1		2	18	2	1		8	2				25	10	3	5	1	34	11			2	11
Brown Creeper				(1)															1					
Golden-crowned Kinglet																			2					
American Robin												2			2		6		6					
European Starling				(30)	14		22		40				125		1	88		43						
Bohemian Waxwing			100	40					147	(20)			10	1318		206			21					
Cedar Waxwing																			22					
House Sparrow	107			180	463	19	1323	30	103	24	30	40	84	330	502	263	376	80	3750	60	47		228	220
Evening Grosbeak									45		32				26								8	
Pine Grosbeak				12					48	1	12	2			53					26		6		
House Finch				10	46									1		3	14		242					
Purple Finch								3							(1)				2					10
Common Redpoll	120	80		23			13		45		192			97	79	176	34		2	6		52	16	
Hoary Redpoll				2			1																	
White-winged Crossbill		32												10	4									
Pine Siskin				10	12				4						17			39						16
American Goldfinch											(6)				15			2						
Snow Bunting	574		50	55	62		71		40				157	30	50	2		4	(155)	145		30		
White-throated Sparrow				1									1		2	1		5						
Dark-eyed Junco					9		6		2			6		2	1	1		70	10				3	
Red-winged Blackbird																1								
Common Grackle					3													1						
TOTAL BIRDS COUNT DAY	1172	245	207	529	1426	98	2061	239	839	78	441	175	235	1668	3061	890	2425	259	6636	312	380	84	375	519
TOTAL BIRDS ONLY IN CP	2	0	0	33	1	0	72	0	1	1	27	0	67	1	2	2	0	1	1	228	12	0	0	0
TOTAL SPECIES COUNT DAY	17	14	7	20	24	13	22	15	18	10	14	20	12	22	27	23	32	11	41	14	7	8	18	19
TOTAL SPECIES ONLY IN CP	2	0	0	3	1	0	3	0	1	1	3	0	1	1	1	2	0	1	1	4	1	0	0	0

SPECIES	SK LANDING P.P. 20 DEC 2018	SK RIVER FORKS 15 DEC 2018	SASKATOON 26 DEC 2018	SAWYER LAKE 24 DEC 2018	SHAMROCK 19 DEC 2018	SHELL LAKE 18 DEC 2018	SWIFT CURRENT 15 DEC 2018	THICKWOOD HILLS- SPRINTWOOD 21 DEC 2018	TURTLE LAKE 27 DEC 2018	TURTLEFORD 28 DEC 2018	WEYBURN 15 DEC 2018	WHITE BEAR 2 JAN 2019	WHITEWOOD 24 DEC 2018	WINGARD 2 JAN 2019	TOTALS COUNT DAY	TOTALS ONLY IN COUNT PERIOD	#COUNTS COUNT DAY	# COUNTS ONLY IN COUNT PERIOD
Canada Goose			2100								2				27254	137	13	2
Mallard			85				2						(1)		5915	1	12	1
Common Goldeneye			178												1213	1	11	1
Gray Partridge	6			(10)	66		68				132	10			1202	36	34	4
Ring-necked Pheasant	4				18		2				23				199	0	12	0
Ruffed Grouse		1		(3)	3			1	1						74	10	30	8
Sharp-tailed Grouse	24		64		3	60				7	18	15	15		765	7	38	2
Rock Pigeon	22		2028	24	163		835	16		25	333	103	90		9907	71	65	1
Eurasian Collared-Dove	11		40		3		78				40	4	41		624	0	36	0
Bald Eagle	(1)			(1)			1						1		100	9	21	8
Northern Goshawk	(1)					1				1			2		13	3	11	3
Golden Eagle	1				1						2		1		16	1	11	1
Great Horned Owl	5		2		11	2	3			2	3	9	1		148	7	41	7
Snowy Owl	1				1	(1)	1				3	3			84	6	25	4
Long-eared Owl	4										1	1			9	0	5	0
Downy Woodpecker	4	1	44	(1)		1	5	2	2	10	4		22	1	491	3	72	3
Hairy Woodpecker	1	1	21	3		1							16	3	344	2	69	2
Black-backed Woodpecker															4	3	4	2
Northern Flicker	1		16				5								50	4	13	4
Pileated Woodpecker			2							1			1		24	5	15	5
Merlin			2												9	0	7	0
Prairie Falcon	1														8	0	6	0
Northern Shrike			1							1			2		18	1	13	1
Canada Jay		1		(6)											87	7	12	2
Blue Jay	13	7	102	1	4	12	6	4		7			25	6	871	2	67	1
Black-billed Magpie	43	10	476	12	26	40	81	34	4	61	40	53	63	1	4480	0	81	0
American Crow			4								2				11	1	6	1
Common Raven	5	22	128	18	5	26	1	42	22	74	29		62		3706	0	83	0
Horned Lark					56		98					11			519	15	22	2
Black-capped Chickadee	23	22	800	11		63	17	45	17	43	1		141	10	4655	0	79	0
Boreal Chickadee							29								91	0	10	0
Red-breasted Nuthatch	1		143		5	2	32	1		2	7		14	3	823	0	66	0
White-breasted Nuthatch	3	2	2															

TABLE 4. Species found in fewer than 6 counts.

SPECIES	LOCALITY AND NUMBER (*=SEEN DURING COUNT PERIOD)
Cackling Goose	Estevan (41), Gardiner Dam (17)
Wood Duck	Regina (1)
Gadwall	Estevan (1)
Northern Pintail	Grayson (1), Crooked Lake
Green-winged Teal	Gardiner Dam (1)
Redhead	Gardiner Dam (15)
Ring-necked Duck	Gardiner Dam (10), Saskatoon (2)
Greater Scaup	Gardiner Dam (20)
Lesser Scaup	Estevan (1), Gardiner Dam (77), Saskatoon (5)
Bufflehead	Gardiner Dam (4)
Common Merganser	Clarks Crossing (3), E.B.Campbell Dam (1), Gardiner Dam (87), La Ronge (1*)
Greater Sage-Grouse	Grasslands National Park (4)
Spruce Grouse	Lac La Plonge (1*)
Willow Ptarmigan	La Ronge (1)
Mourning Dove	Harris (1), Moose Jaw (1), Prince Albert (1), Saltcoats (1)
American Coot	Estevan (2)
Double-crested Cormorant	Gardiner Dam (1)
American White Pelican	Gardiner Dam (2)
Great Blue Heron	Regina (1)
Sharp-shinned Hawk	Ft. Qu'Appelle (1*), Melfort (1), Prince Albert (1), Saskatoon (1*)
Cooper's Hawk	Indian Head (1)
Red-tailed Hawk	Eastend (1), Ft. Qu'Appelle (1*)
Rough-legged Hawk	Balgonie (1), Broadview (1*), Eastend (1), Grasslands National Park (4)
Northern Hawk Owl	Candle Lake (2)
Short-eared Owl	Regina (6)
Northern Saw-whet Owl	Morse (1*)
American Three-toed Woodpecker	Candle Lake (3), Hudson Bay (1*), Love-Torch River (1), Saskatoon (1)
Gyrfalcon	Borden-Radisson (1), Crooked Lake (1), Gardiner Dam (1)
Peregrine Falcon	Ft. Qu'Appelle (1*)
Townsend's Solitaire	Moose Jaw (1*), Qu'Appelle (1), Qu'Appelle Dam (1)
Varied Thrush	Borden-Radisson (1), Saskatoon (1)
Red Crossbill	E.B.Campbell Dam (8), Saskatoon (7)
Spotted Towhee	Saskatoon (1*)
American Tree Sparrow	Borden-Radisson (4), Eastend (7), Qu'Appelle (6), Saskatchewan Landing (1)
White-crowned Sparrow	Prince Albert (1)
Rusty Blackbird	Nicolle Flats (1), Odessa (2), Saskatchewan Landing (1)
Brewer's Blackbird	Weyburn (1)



Pileated Woodpecker. Photo Credit Nick Saunders

TABLE 5. Birds not identified to species.

CATEGORY	LOCALITY AND NUMBER (*=SEEN DURING COUNT PERIOD)
Teal sp.	Regina (1)
Small Accipiter	Regina (1)
Hawk sp.	Avonlea (1) Clarks Crossing (1) Saskatoon (1)
Woodpecker sp.	Pike Lake (1)

TABLE 6. New (in bold and italics) and tying high counts for individual species 2018.

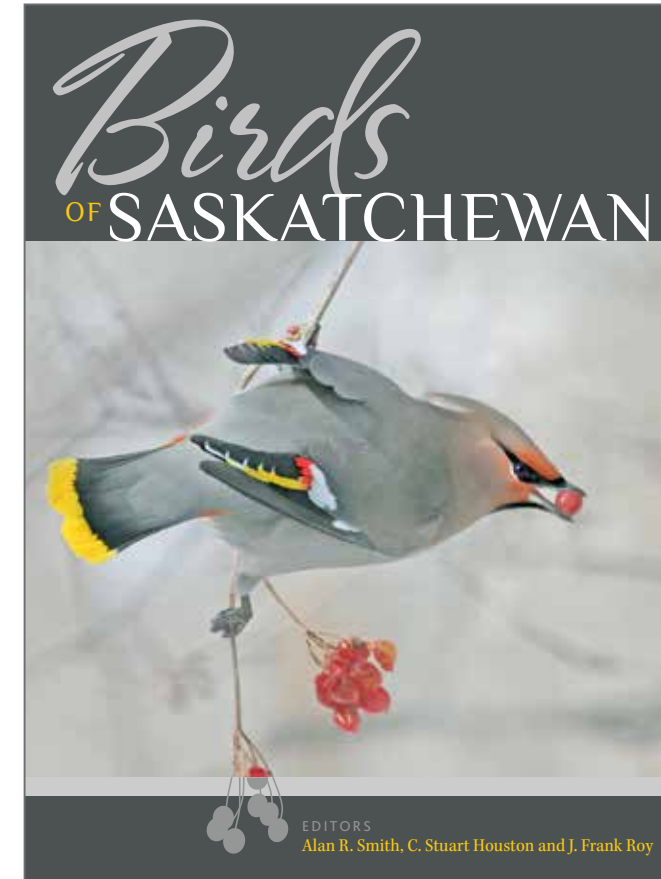
LOCATION	2018 COUNT	SPECIES	PREVIOUS HIGH	LOCATION, YEAR
Gardiner Dam	10	<i>Ring-necked Duck</i>	7	Gardiner Dam 2011
Gardiner Dam	77	<i>Lesser Scaup</i>	24	Gardiner Dam 2004
Gardiner Dam	1	Double-crested Cormorant	1	6 previous counts north to Grand Centre-Pierceland and Squaw Rapids
Regina	1	Great Blue Heron	1	5 previous counts north to Barrier Lake
Saskatoon	1	Spotted Towhee	1	13 previous counts north to Turtle Lake

UPDATE ON BIRDS OF SASKATCHEWAN

Donna Bruce
Special Publications Editor

It's been quite a whirlwind since the offer of a special pre-print price for *Birds of Saskatchewan* appeared in the pages of *Blue Jay* last fall. I hope that by now most of you have seen, and perhaps taken ownership of, a copy of our glorious special publication No. 38.

Our first printing of 1,250 copies was, apparently, a cautious estimate; we sold out before the books were delivered in early January. Profuse thanks to the eight local societies that helped with distributing some 375 copies to those who had taken advantage of the pre-print offer. Saskatoon's McNally Robinson Booksellers also demonstrated a lot of interest, and we had to scramble to keep them in stock leading up to the book launch they hosted for us in late January. A second launch was held in late February at the Royal Saskatchewan Museum in Regina. To view a copy of the excellent short video that was shown at both launches, visit the *Birds*



of Saskatchewan page on Nature Saskatchewan's website: www.naturesask.ca/publications/birds-of-saskatchewan

It was always the dream of editors Al Smith, Stuart Houston and Frank Roy to see copies of *Birds of Saskatchewan* go to Saskatchewan libraries and high schools. With more than enough money in the

Society's Manley Callin Fund to pay for the book, the Nature Saskatchewan Board of Directors didn't hesitate to pursue that dream. As a result, 65 copies have gone to eight of the 10 library regions, and 212 copies have gone to 13 of the 25 Saskatchewan school divisions.

McNally Robinson has taken 400 of the 750 copies in our second printing, and board member Lorne Scott has been a selling machine, including 20-some copies sold at a recent Saskatchewan Wildlife Federation meeting! We also have copies in Wild Birds Unlimited (Saskatoon), the Royal Saskatchewan Museum, and the Nature Saskatchewan office (yes, there will be copies available for purchase at the Spring Meet in Eastend).

One downside to such a massive and dense volume of information is the potential for errors. Many of the errors identified to date involve incorrect names, so please do take note of the following corrections, only a few of which got into the second printing.

Corrections for *Birds of Saskatchewan*

- p. 7 column 1, line 5 should read "resolving many questions of identity ..."
- p. 30 under Treatment and Terms, first paragraph, first sentence should read "Species and scientific names are presented in the order used by the AOU (now AOS: see As we go to Press) ..."

- p. 36 photo is by Hamilton Greenwood
- p. 207 under Banding, line 4, the date should be 11 Aug 1965
- p. 352 photo on upper right is by Harold Fisher
- p. 433 photo credits for Red-eyed Vireo are reversed; should be Haga on left and Saunders on right
- p. 652 upper paragraph, line 13, should be Margot Taylor

Corrected in second printing

- p. 352 photo on lower left is by Nick Saunders
- p. 372 photo credits are reversed; should be Gehlert on left, Priebe on right
- p. 479 last line of Blue-gray Gnatcatcher account should read "... and seen also by Joel Priebe in Morse."

DISTRIBUTION OF PRAIRIE PASQUEFLOWER IN SASKATCHEWAN

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Introduction

Identifying and mapping new locations of sensitive species is an essential component of the biodiversity conservation process. Recently, we have developed a new approach for mapping distribution of vascular plant species in Saskatchewan, which contributes to biodiversity assessment at different spatial and temporal scales (Kricsfalusy et al. 2015).¹ The suggested approach demonstrates on the model species — prairie

pasqueflower (*Pulsatilla nuttalliana* (de Candolle) Berchtold ex J. Presl, syn. *Anemone patens* L. subsp. *multifida* (Pritzell) Hultén) — how to combine traditional research records (herbarium collections and field surveys) and citizen science (phenological observations) with modern technologies (GIS, GPS, and online databases) to map plant species distribution and analyze their habitats affinities¹.

Precise data about distribution of prairie pasqueflower, which were lacking for many areas in Saskatchewan, was a vital part of the above-mentioned approach. Due to the size limit for a journal article, we were not able to publish detail distribution data, i.e. list of locations of prairie pasqueflower

in Saskatchewan, in our previous paper.¹ Therefore, in this paper we aim to fill the information gap on distribution of prairie pasqueflower by providing existing but previously unpublished data (herbarium records, phenological observations and field occurrences). Overall, these baseline data can be used to establish effective population monitoring which will provide conservationists with important insights into how prairie pasqueflower may respond to the increasing anthropogenic impact.

Methods

Distribution records of prairie pasqueflower (Figure 1) were obtained from 1) herbarium specimens collected in the period from 1920 to 2000, 2) phenological observations reported by citizen scientists (2001–2010), and 3) our field surveys (2011–2013, with some locations registered in 2014–2018). For detailed description of the methods used for collecting data and quality assurance processes, analyzing and mapping distribution of prairie pasqueflower, please see our previous paper.¹ Below we provide only key methodological points.

The primary sources of herbarium data were specimens of prairie pasqueflower from the collections in the W.P. Fraser Herbarium at the University of Saskatchewan (SASK)² and the G.F. Ledingham Herbarium at the University of Regina (USAS).³ Based on those data, 168 locations were selected for distribution analysis. In addition, 9 records were compiled from specimens obtained from three other Canadian herbaria.¹ Phenological

observations on prairie pasqueflower recorded by citizen scientists are available in the SK PlantWatch⁴ database from which through quality assurance processes 23 observation records were used in our study. The georeferenced species locations collected during our field surveys generated the largest source of data. A total of 248 point occurrences of prairie pasqueflower were selected from these georeferenced data for distribution analysis.

Maps depicting the distribution of prairie pasqueflower were prepared using the GIS program ArcMap 10.5. To develop the species distribution map we used a new approach for mapping flora of Saskatchewan.¹ The grid template was divided into mapping cells of 50 km x 50 km. For mapping prairie pasqueflower in Saskatoon we used an approach previously applied in Toronto, Ontario.⁵ In this case, the grid template was divided into mapping cells of 2 km x 2 km.

Results and Discussion

Analysis of the distribution of prairie pasqueflower in Saskatchewan allowed us to identify spatial patterns of species range.¹ The most important of them is the gradual decrease in the number of species locations within the province as we move from south to north and from west to east. The center of the prairie pasqueflower latitudinal range in Saskatchewan was found to roughly overlap with the northern and southern boundaries of the Prairie ecozone (Figure 2). Lists of the 448 locations of prairie pasqueflower — herbarium records (168), phenological observations (23), and author's field surveys (248) — which were not published in our previous paper¹ are presented in Tables 1-3.

In addition to these findings, collected information allows us to

shed light on some temporal and spatial patterns of the distribution of prairie pasqueflower which wasn't elaborated in our previous paper.¹ Below we describe historical collections of prairie pasqueflower in Saskatchewan (temporal patterns at regional scale) and features of species distribution in Saskatoon (spatial patterns at local scale).

Historical collections in Saskatchewan

It turns out that specimens of prairie pasqueflower deposited in the W.P. Fraser Herbarium at the University of Saskatchewan (SASK) provide a unique opportunity not only for the species distribution analysis but also to look at history of botanical explorations in the

province. According to our analysis, a total of 75 collectors deposited 137 specimens of the prairie pasqueflower in the SASK herbarium from 1920 to 2000 (Figure 3). Given the amount and character of the available information, we divided these distribution data into 9 decades and after that grouped them into three periods.

The first period, from 1920 to 1950, is characterized by scarcity of information. The distribution data for the initial two decades (1920–1940) include only 14 specimens of prairie pasqueflower deposited by 10 collectors. This could be largely due to the small number of collectors, concentration of their activity in more approachable areas of the province



FIGURE 1. Prairie pasqueflower in full bloom in Northeast Swale, Saskatoon. Photo credit: V. Kricsfalusy

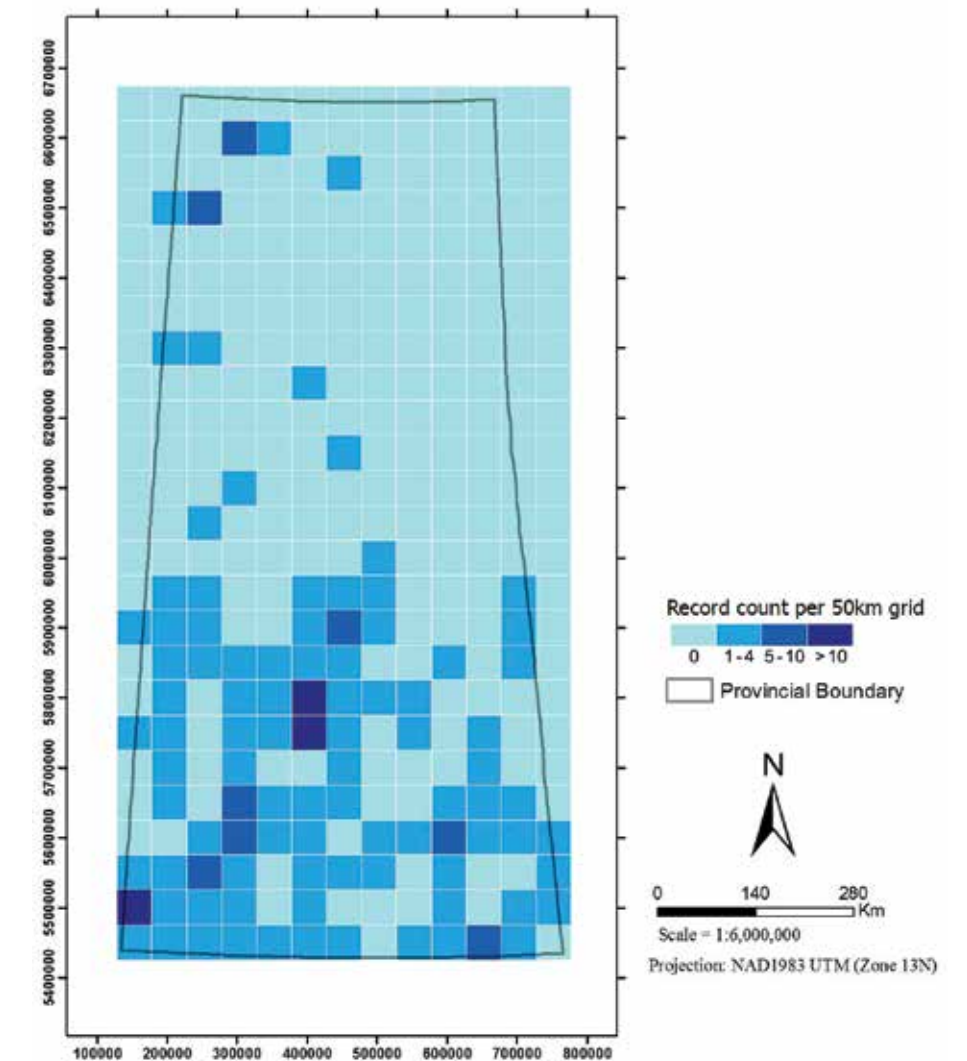


FIGURE 2. A distribution map of prairie pasqueflower in Saskatchewan (from Kricsfalusy et al. 2015).

TABLE 1. List of herbarium specimens (n=168) of prairie pasqueflower collected in Saskatchewan (SASK and USAS, 1920–2000).

A. LIST OF REPRESENTATIVE SPECIMENS (N=134) IN THE W.P. FRASER HERBARIUM AT THE UNIVERSITY OF SASKATCHEWAN (SASK)

Moose Mountain Creek Valley, 31 May 1987, *V.L. Harms* (SASK 92761); Saskatoon, Sutherland Beach, 31 May 1997, *B. Wlad* (SASK 145197); SW end of Cluff Lake, 15 June 1977, *V.L. Harms* (SASK 65678); Uranium City area, 2 km W of Uranium City mine operations, 23 August 1981, *V.L. Harms* (SASK 75399); E of Stewart Valley, near Swift Current, 18 April 1969, *J. Looman* (SASK 107921); W of Saskatchewan Landing, 18 April 1969, *J. Looman* (SASK 107922); Wiseton, 22 mi S, L.S.D 4 in S32 T23 R12 W3, 27 May 1978, *J.H. Hudson* (SASK 68070); Gravelbourg, Wood River area, NE 24 T12 R5 W3, 18 June 1981, *A. Schewe* (SASK 73380); Skinner Marsh, SW S23 T19 R12 W3, 8 May 1975, *V.J. Leiffers* (SASK 122444); Cochin, 17 July 1963, *J. Looman* (SASK 107915); S of Rush Lake, Swift Current, 24 May 1963, *J. Looman* (SASK 107914); mi 51, Hwy 155, 11 mi. S of Beauval Forks, Beaver River Valley, 12 July 1972, *V.L. Harms* (SASK 46450); Stony Rapids, 12 August 1960, *J.S. Maini* (SASK 11329); 8 mi. NW of Duck Lake, 20 May 1955, *L.W. Gellata* (SASK 11380); Saskatoon, ?, *O. C. Furniss* (SASK 144311); Cypress Hills, 10 June 1953, *K.F. Best* (SASK 121042); Rock Glen, 4 July 1963, *J. Looman* (SASK 107916); NE end of Cluff Lake, above AMOK exploration site, 13 July 1977, *V.L. Harms* (SASK 65301); Waterhen River Crossing, near Meadow Lake, 17 May 1966, *J. Looman* (SASK 107917); 8 mi. E of Saskatoon, 27 September 1954, *G.W. Selleck & R.T. Coupland* (SASK 11378); Masfield PFRA Community Pasture, 22 April 1969, *J. Looman* (SASK 107920); Saskatoon, 30 May 1933, *W.P. Fraser* (SASK 11375); SE end of Cluff Lake, 12 June 1972, *V.L. Harms* (SASK ?); Katepwa Lake, 6 May 1953, *R.C. Russell* (SASK 82909); Saskatoon, Sutherland, 20 April 1958, *D. Riley* (SASK 82910); Saskatoon, 11 May 1927, *H. Cameron* (SASK 11392); Swift Current, 5 May 1936, *J.L. Bolton* (SASK 108010); Midale, ? May 1940, *G.C. ?* (SASK 43719); Cadillac R. A., Sec8 T7 R13 W3, 28 April 1947, *A.C. Budd* (SASK 108017); Cypress Hills, 16 August 1944, *A.C. Budd* (SASK 108014); Besnard Lake, ca 1–2 km N of Narrows Channel Crossing, 33 km off Besnard Lake Road, 25 June 1992, *V.L. Harms* (SASK 132861); Besnard Lake, T73 R1 W3, 23 June 1992, *V.L. Harms* (SASK 132860); Swift Current, 5 May 1937, *J.L. Bolton* (SASK 11386); Saskatoon, 15 May 1938, *W.P. Fraser* (SASK 11333); Cranberry Flats recreation site, 3.5 mi (5.5 km) S of Saskatoon. Along E shore of South Saskatchewan River, LSD 2,5,6,7 & 8 Sec30 T35 R6 W3, 18 June 1992, *M. Lineman* (SASK 163234); Saskatoon, E shore of South Saskatchewan River, NW of Sutherland subdivision, behind Regional Psychiatric Centre, LSD 7 Sec10 T37 R5 W3, 8 July 1993, *M. Lineman* (SASK 169299); Saskatoon, Silverwood, Sec14 T37 R5 W3, 11 August 1994, *M. Lineman* (SASK 163788); Saskatoon, Silverwood, Sec14 T37 R5 W3, 25 May 1994, *M. Lineman* (SASK 163598); Moose Mountain Creek Valley, 12 August 1987, *V.L. Harms* (SASK 129402); Cypress Hills, 13 May 1952, *K.F. Best & J. White* (SASK 121041); Swift Current, Alexander farm, NE S20 T15 R13 W3, 12 May 1952, *A.C. Best & K.F. Best* (SASK 121040); Saskatoon, 29 May 1933, *R.J. Ledingham* (SASK 82907); Saskatoon, 6 September 1933, *R.C. Russell & R.J. Ledingham* (SASK 82906); Bonefield, NE shore of Lake Athabasca, 19 May 1973, *L. & L. Muller-Wille* (SASK 54469); Saskatoon, 11 May 1949, *G.E. Fraser* (SASK 11379); Lizard Lake, 21 May 1961, *R.C. Russell* (SASK 82903); Saskatoon, 14 April 1938, ? (SASK 11394); Cypress Hills Provincial Park, 7 June 1953, *S. Zilke* (SASK 11385); Prince Albert, 3 May 1940, *O.C. Furniss* (SASK 144238); Rolling prairie, NE of Saskatoon, 13 May 1960, *C. Robert* (SASK 26420); Saskatoon, 27 April 1923, ? *Gios* (SASK 82904); Saskatoon, 3 June 1927, *B.G.S.* (SASK 82905); Chipewyan, 20 May 1981, *R. Marles* (SASK 78520); NE shore of Cluff Lake, 7 June 1993, *J. Ternier* (SASK 169784); 7 mi. N of Birmingham, 10 May 1992, *W. Schatz* (SASK 134977); N shore of Brightsand Lake, ca 22 km E of St. Wallburg, S1/2 Sec10 T54 R20 W3, 11 July 1999, *V.L. Harms* (SASK 147229); 4 mi. E of Carlyle, NW 1/4 Sec2 T8 R2 W2, ? 1998, *D. Silcox* (SASK 145264); SE of Tompkins, near Swift Current, 21 April 1969, *J. Looman* (SASK 107899); Souris River Valley, Estevan area, ca 1.5 km S just N of Woodland Regional Park, SW1/4 Sec14 T2 R8 W2, 26 May 1986, *V.L. Harms, D.F. Hooper & L. Baker* (SASK 129857); W of Fort Pitt, 15 May 1973, *J. Looman* (SASK 107873); Frenchman River badlands, 27 May 1969, *J. Looman* (SASK 107905); Pinto Butte, 4 May 1970, *J. Looman* (SASK 107878); 8 mi. E of Swift Current, 18 April 1969, *J. Looman* (SASK 107903); Hansen Lake Road, Narrow Hills Provincial Park, Lower Fishing Lake, 24 June 1964, *G.W. Argus* (SASK 25500); Tompkins, 13 June 1985, *J. M. Perron* (SASK 120007); Uranium City area, Lodge Bay, 8 km E of Lorado area, ca 30.5 km S, 23 August 1981, *V.L. Harms* (SASK 75348); Souris River Valley, Elcott, ca 2 mi. N in local campgrounds area, NW 1/4 Sec25 T1 R3 W2, 28 May 1986, *V.L. Harms* (SASK 129366); Saskatoon, Silverspring Prairie, NW Sec12 T37 R5 W3, 10 July 1990, *V.L. Harms* (SASK 132309); Souris River Valley, N of Roche Percee, NE 1/4 Sec36 T1 R6 W2, 26 June 1986, *V.L. Harms* (SASK 129364); Moose Jaw, Thunder Creek, 19 May 1985, *B. Cooper* (SASK 94775); Wellington P.F.R.A. Community Pasture, near Tyvan, 9 May 1985, *B. Kishchuk* (SASK 90451); 52 km E of Saskatoon along Hgw 5, NW 1/4 Sec33 T36 R28 W2, 22 June 1986, *J. Neufeld* (SASK 140505); N of Saskatoon, Northern Chemical Terraces on NW shore of South Saskatchewan River, NW 1/4 LSD 2 Sec26 T37 R5 W3, 31 May 1993, *M. Lineman* (SASK 169686); ca. 1.5 mi. SE of Dundurn, Sec35 T 32 R4 W3, 16 April 1992, *J. Neudorf* (SASK 134748); Western half of Fort-a-la-Corne area, near confluence of North and South Saskatchewan River, Sec13 T49 R22 W2, 10 July 1980, *B. Godwin & L. Baschak* (SASK 134396); Elbow, LLD NW S13 T 25 R5 W3, 21 May 1992, *B. Wait* (SASK 136141); The Pines, NE S34 T48 R21 W2, 25 May 1995, *B. Wait* (SASK 136140); Besnard Lake, T73 R1 W3, 17 May 1995, *M.M. Hart* (SASK 137584); 9 mi. W of Birsay and 1.75 mi. N, NW 1/4 Sec9 T52 R9 W3, 30 May 1996, *B. Robson* (SASK 137980); Prince Albert National Park, SW 1/4 Sec5 T57 R1 W3, 29 June 1996, *V.L. Harms* (SASK 139720); Sandy Prairie N of Strawberry Lake, 12 mi. S of Indian Head, 13 May 1965, *G.J. Jones, L. Roney & G. Allen* (SASK 32295); Saskatchewan Landing, Swift Current, 13 May 1969, *J. Looman* (SASK 107906); Uranium City area, S side of Hanson Bay at SW end of Beaverlodge Lake, ca 1.5 km S, SW of Lorado Wharf, 22 August 1981, *V.L. Harms* (SASK 75347); N side of Lake Athabasca near Uranium City, ca 1.5 km S, 5 July 1979, *V.L. Harms* (SASK 70252); Prominent dolomite outcrop ridges of carswell formations, about 8 km W of Cluff Lake, 18 July 1977, *V.L. Harms* (SASK 65337); Souris River Valley, ca 5 mi. SE of Estevan, NE 1/4 Sec34 T1 R7 W2, 24 July 1987, *V.L. & R.M. Harms* (SASK 129648); Souris River, ca 1/4 mi. N of Roche Percee campground, NE 1/4 Sec33 T1 R6 W2, 20 May 1988, *V.L. Harms* (SASK 129867); 5 km NW of Bredenbury along Yellowhead Hwy, 18 May 1982, *P. Burton* (SASK 134031); N of Lumsden, 4 May 1985, *A.M. Tuchscherer* (SASK 79537); S of Maidstone, 14 May 1973, *J. Looman* (SASK 107890); Carruthers, 3 May 1973, *J. Looman* (SASK 107872); 0.5 km S of Saskatoon, on Clarence Avenue at junction with freeway, 20 May 1986, *P.A. Ryan* (SASK 898594); Cranberry Flats, 12 May 1985, *W. Chypkowski* (SASK 81435); Otosquen, mi. 27, N of Melfort, 14 May 1970, *J. Looman* (SASK 107887); Moose Jaw–Watrous quad, 28 April 1969, *N.A. Skoglund* (SASK 41756); Duff, near Yorkton, 13 May 1970, *J. Looman* (SASK 107896); N of Whitewood, Qu’Appelle River, 15 May

1963, *J. Looman* (SASK 107912); E of Matador, 22 May 1969, *J. Looman* (SASK 107904); Monet C.P., Elrose, 21 May 1963, *J. Looman* (SASK 107913); 0.25 mi. N of Mozart, SW of Wadena, 15 km E of Wynyard, T32 R15 W2, 2 May 1982, *S. Weldon* (SASK 134120); S of Tompkins, 23 April 1969, *J. Looman* (SASK 107902); N of Webb, 17 April 1969, *J. Looman* (SASK 107901); 4 mi. N of Cando, 10 May 1971, *J. Looman* (SASK 107987); W of Muddy Lake, 14 May 1973, *J. Looman* (SASK 107898); Rolling prairie NE of Saskatoon, Sec12 T37 R4 W3, 19 April 1960, *R. Connel* (SASK 26421); 3 mi. SE of Coderre, 28 May 1986, *D.G. Huel* (SASK 81286); Clearwater River, near Methy portage, in an open S sloping area with a thin Jack pine canopy, 13 June 1979, *R. A. Wright* (SASK 72376); Beaver Creek, ca 9 mi. S of Saskatoon, 4 June 1978, *A. Doug* (SASK 70969); The Pinehouse, Key Lake Road, ca 23 km E of Orphan Lake, on Haultian River, 24 August 1979, *B. Godwin Z. Abouguendia* (SASK 72011); N side of Lake Athabasca, Langley Bay, ca 2.5 km. N of Gunnar towards S end of Crackingstone Peninsula, 8 August 1981, *V.L. Harms & P.L. Sky* (SASK 75346); Watrous, 20 May 1938, *J. Campbell* (SASK 108012); Saskatoon, 30 May 1936, *W.P. Frazer* (SASK 108011); Cranberry Flats, 12 May 1985, *E. Yaworski* (SASK 81504); Saskatoon, 2 June 1920, *W.P. Fraser* (SASK ?); Cadillac R.A., Sec8 T7 R13 W3, 2 May 1946, *A. C. Budd* (SASK 108015); Souris River Valley, just N of Roche Percee campground, 3.5 km east and 1.5 km N of Roche Percee, NE 1/4 Sec33 T1 R6 W2, 26 May 1986, *V.L. Harms, D.F. Hooper & L. Baker* (SASK 129365); 7 km W of Truax, 29 May 1975, *J. Looman* (SASK 107874); Along Hwy 5, 2.5 mi. E of Quill Lake, 3 June 1959, *C.H. Hood* (SASK 11393); 12 mi. S of Saskatoon, 17 May 1961, *R. Newsome & G. Hulett* (SASK 11387); Moose Jaw – Watrous quad, T20 R13 W3, 16 July 1969, *N.A. Skoglund* (SASK 41929); Upper Rousay Lake, 28 May 1973, *A. Schmidt* (SASK 123367); Near Court, Kindersely, 12 May 1973, *J. Looman* (SASK 107875); N of Murraydale, 3 June 1970, *J. Looman* (SASK 107888); Hearts Hill Community Pasture, 11 May 1972, *J. Looman* (SASK 107889); S of Wiseton, 8 May 1970, *J. Looman* (SASK 107882); 5 km NW of Verlo, S11 R16 T20 W3, 7 May 1970, *J. Looman* (SASK 107883); N of Rosetown, Eagle Creek, 8 May 1970, *J. Looman* (SASK 107884); Near Lady Lake, 15 May 1970, *J. Looman* (SASK 107885); E of Glidden, 27 May 1970, *J. Looman* (SASK 107886); S of Dellard, Frenchman River, 15 May 1970, *J. Looman* (SASK 107879); East of Mawer, 6 May 1970, *J. Looman* (SASK 107880); SE of Roadene, S22 R17 T20 W3, 7 May 1970, *J. Looman* (SASK 107881); Wooded draws of Matador Research Station, NW 1/4 Sec14 T20 R13 W3, 18 June 1991, *D. Lawrence* (SASK 133834); Wooded draws of Matador Research Station, NW 1/4 Sec14 T20 R13 W4, 3 June 1992, *D. Lawrence* (SASK 133772); Lily Plains natural prairie, ca 1 mi. W of Lily Plains (ca 13–14 km W of Prince Albert), ca 1.5 mi. S of North Saskatchewan River, NE 1/4 Sec29 T48 R1 W3, 7 July 1994, *V.L. & R.M. Harms* (SASK 133681); Coteau region, SE1/4 Sec35 T23 R12 W3, about 8 mi. N & 8.5 mi. W of Beechy & 19 mi. W and 1 mi. N of Lucky Lake, 9 June 1996, *R. Salmon & B. Corinne* (SASK 141943); E of Carlyle, NW 1/4 Sec2 T8 R2 W2, ? May 1995, *D. Silcox* (SASK 142755); Biggar, 9 July 1996, *V. Leuschen* (SASK 140382); E Ridhe Road at Armit River, 5 km S and 5.5 km E of Armit (1–1.5 km W of Manitoba border, SW 1/4 Sec13 T44 R29 W2, 28 June 1983, *V.L. Harms, D.F. Hooper & L. Baker* (SASK 140906); Saskatoon, Silverspring prairie, WC to NW Sec12 T 37 R5 W3, 21 April 1991, *V.L. Harms* (SASK 140756); Close to S Shore of Candle Lake, 8 July 1962, *J.M.A. Swan* (SASK 32595); The Pinehouse - Key Lake Road, ca 23 km E of Orphan Lake, on Haultian River, 28 July 1979, *B. Godwin & Z. Abouguendia* (SASK 68262); The Biddulph Half Section Research Area, ca 21 km S of Saskatoon along Road 219, just N of White Cap Indian Reserve, SE 1/4 LSD 1 Sec12 T34 R6 W3, 3 June 1986, *B. Pylypec* (SASK 97862); The Biddulph Half Section Research Area, ca 21 km S of Saskatoon along Road 219, just N of White Cap Indian Reserve, SE 1/4 LSD 1 Sec12 T34 R6 W, 7 May 1987, *B. Pylypec* (SASK 97953); The Kernon Prairie, ca 2.5 km E of Sutherland subdivision, E Saskatoon, SE 1/4 of Sec16 T37 R4 W3, 17 May 1985, *B. Pylypec* (SASK 97074); The Pinehouse, ca 23 km E of Orphan Lake, on Haultian River, 24 August 1979, *B. Godwin & Z. Abouguendia* (SASK 68282); Near NE end of Cluff Lake, AMOK exploration camp, 19 July 1977, *V.L. Harms* (SASK 65303); N of Antelope, 21 July 1969, *J. Looman* (SASK 107900); NE of Coronach, Sec1 T3 R26 W2, 5 July 1980, *Z. Abouguendia* (SASK 92106); North Battleford, 17 May 1985, *P. Grillz* (SASK 81211); N base of Pasquia Hills at S edge of Carrot River Valley, Near Rice River campsite, 4 km E of Rice River Crossing on Hwy 55, Sec34 T52 R3 W2, 18 July 1984, *D.F. Hooper & L. Baker* (SASK 92713); SE of Little Fishing Lake, NW Sec11 T56 R24 W3, 24 July 1977, *J. Haraldson & T. Rock* (SASK 123368).

B. LIST OF REPRESENTATIVE SPECIMENS (N=34) IN THE G.F. LEDINGHAM HERBARIUM AT THE UNIVERSITY OF REGINA (USAS)

White City, 2 miles N and Pilot Butte natural area N of gravel pits, 16 May 1985, *G.F. Ledingham* (USAS 7982); NW 11, 37, 9ws, Asquith study area, 22 May 1970, *G.W. Pepper* (USAS 7929); West Block of Cypress Hills, N of field station, NE S20 T7 R29 W3, 21 May 1984, *G.F. Ledingham* (USAS 7930); Sommet du Coteau Boise au sud de Tompkins, 13 June 1958, *B. Boivin & J.M. Perron* (USAS 7931); Wiseton, 22 miles S, L.S.D. 4 S33 T23 R12 W3, 27 May 1978, *H. Hudson* (USAS 7932); Dundurn, 27 May 1975, *E.W. Sullivan* (USAS 7933); Bethesda Church, 4 miles W, Dummer 9 miles N, Milestone 15 miles W, 28 April 1980, *G.F. Ledingham* (USAS 7934); Belanger Creek, east end of Cypress Lake, N bank, May 09 1957, *G. F. Ledingham* (USAS 7936); Sissor Creek area in Qu’Appelle Valley, 10 miles of Rocanville, 21 May 1966, *G.F. Ledingham* (USAS 7937); Superme, Twp 2, Rg 26, Sec 35, 01 August 1969, *G F. Ledingham* (USAS 7938); Crooked Lake in Qu’Appelle Valley, 05 May 1975, *G. Anweiler* (USAS 7939); Prince Albert, 24 April 1955, *M.A. Welsh* (USAS 7941); Prince Albert, 02 May 1955, *M.A. Welsh* (USAS 7942); Prince Albert National Park, 23 May 1955, *M.A. Welsh* (USAS 7942); Regina, 3 miles E, 29 April 1949, *B. Rawlinson & G.F. Ledingham* (USAS 7943); Cypress Hills PP, road to Ranger station, 22 May 1960, *D.R. Wade & D.E. Wade*, 22 May 1960 (USAS 7944); Regina, 6 miles NW, Hungry Hollow, *D.R. Wade & D.E. Wade* (USAS 7945); Estevan, SE & Sec7 T2 R7 W2, 09 July 1971, *M.E. Jonescu* (USAS 7946); Estevan, S31 T1 R8 W2, 31 July 1973, *M.E. Jonescu* (USAS 7947); Indian Head, 9 miles S, 19 May 1949, *G.F. Ledingham* (USAS 7949); Cactus Hills, 8 miles SW of Briercrest, 12 miles W of Hearne, NW S19 T13 R25 W2, 28 July 1987, *G.F. Ledingham* (USAS 7950); Missouri Coteau, Dirt Hills, 6 miles SE of Spring Valley, 25 April 1986, *G.F. Ledingham* (USAS 7951); Strawberry Lakes N, 12 miles S of Indian Head, 13 May 1965, *G.J. Jones & L. Roney & G. Allen*, (USAS 7952); Cactus Hills, Dry Lake N, Strawberry Lakes 12 miles S of Indian Head, N ½ S22 T16 R13 W2, 24 May 1979, *G.F. Ledingham* (USAS 7953); Missouri Coteau, Dirt Hills, 6 miles S and 5 miles W of Avonlea, SW S11 T12 R24 W2, *G.F. Ledingham* (USAS 7954); Melaval 2 miles N, 22 April 1969, *G. Walker & N. Walker* (USAS 21062); Melaval 2 miles N, 22 April 1969, *G. Walker & N. Walker* (USAS 21063); Grasslands NP, E side of East Block, 7 miles W of Killdeer & NE S7 T2 R4 W3, 14 May 1990, *G.F. Ledingham* (USAS 31911); Val Marie, West Block; 49 N, 107 W, 05 May 1970, *B. de Vries* (USAS34034); Pheasant Creek coulee, Katepwa, Qu’Appelle Valley, E of Fort Qu’Appelle, 14 May 1960, *B. de Vries* (USAS 34035); Fort Qu’Appelle, 02 June 1959, *B. de Vries* (USAS 34036); Swift Current, 12 May 1952, *A.C. Budd* (USAS 34037); Maryfield, N, Pipestone Valley, 07 May 1967, *B. de Vries* (USAS 34038); Osage, 16 miles E, N end of Goosberry Lake, 21 May 03, *G.F. Ledingham & H. Morrison* (USAS 47122).

and around large towns with research centers (e.g., more than half of all specimens were collected in Saskatoon and its vicinity) and possible economic impact of the Great Depression. During 1941–1950, only two collectors deposited four specimens as this time period coincides with World War II.

The second period, from 1951 to 2000, is characterized by a significant increase in the number of collectors and deposited specimens of prairie pasqueflower. Over the initial decade (1951–1960) of this period number of collectors increased to 13, although adequate change in number of herbarium specimens is not observed (13). The highest number of specimens (36) was deposited in the next decade (1961–1970), most likely due to intensification of agriculture, forestry practices and industrial development in the province which led to an increased interest in floristic surveys. After that, collection efforts plateau for the next decades (1981–2000) with large numbers of collectors (18).

The third period, from 2001 until 2018, is characterized by a sharp decline in both collectors and specimen collections probably due to a decrease in research funding and general interest in botany. There are no specimens of prairie pasqueflower deposited during this period in the SASK herbarium. However, the additional data on distribution of prairie pasqueflower in Saskatchewan were obtained from the phenological observations deposited in the SK PlantWatch database (2001–2010: 23 locations) and our field surveys (2011–2018: 248 locations). In terms of mapped grid cells 50 km x 50 km, these records account for 17 new mapping units (17.3% of total) of prairie pasqueflower in Saskatchewan

(Figure 2). It should be noted that this map represents the record count (herbarium vouchers, phenological observations, and field surveys) and as such is a function of collecting bias. It may not be necessarily representative of true density of prairie pasqueflower in any given area.

Spatial distribution in Saskatoon

To determine how well herbarium and phenological data reflect actual distribution of prairie pasqueflower in the best sampled part of the species

range, i.e. city of Saskatoon and its vicinity, we conducted intense field surveys in this area during a few vegetation seasons. The design of surveys aimed to confirm sites that have already been visited by previous researchers and from which herbarium and literature records are available, as well as to investigate occurrence of prairie pasqueflower in potentially suitable habitats.

We hypothesized that remnant prairie habitats scattered within the urban landscape in Saskatoon may provide suitable niches for prairie

pasqueflower. Our study identified that the historical data on distribution of prairie pasqueflower in Saskatoon account for 13 grids cells (2 km x 2 km) and our field surveys contributed 9 new mapping units (40.9% of the total) (Figure 4). These results strongly supported our original hypothesis. As it stands now, the number of grid cells for the Saskatoon, occupied by prairie pasqueflower equals 22, which accounts for 13.2% of total for the entire city.

During field surveys, we determined that some locations of prairie pasqueflower are no longer extant in Saskatoon over the last 50 years due to direct habitat destruction. It was found that densely built-up areas affect the survival of this species by reducing the extension of suitable habitat, fragmenting

populations, and increasing edge effects.⁶ A good example of this is one of the study sites in the southern part of Saskatoon, where historical records indicate the presence of prairie pasqueflower. However, no individual plants were found there during our field surveys, due to habitat loss caused by road infrastructure development on the site. This highlights the necessity of preserving large areas of remnant prairies which can support viable populations of native plant species within the urban matrix. It's of particular importance, given that the range of prairie pasqueflower has been contracting in Saskatchewan over the past few decades, especially in the vicinity of major urban centers like Regina and Saskatoon.⁷

Conclusions

The obtained results indicate that herbarium collections and phenological observations can be used as baseline data for mapping prairie pasqueflower. However, to obtain more detailed distribution data, specially designed target field surveys or predictive distribution modelling are required. High accuracy species distribution maps could be a powerful tool for population monitoring and effective conservation management.

Acknowledgements

List of people involved in gathering information from herbarium collections, phenology database and assisting with the field surveys, as well as numerous organizations supported this study was provided in our previous publication.¹

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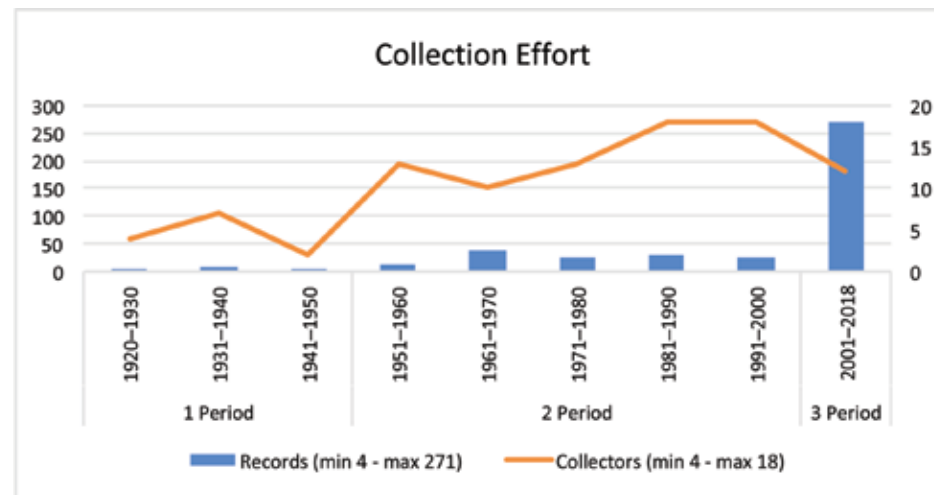


FIGURE 3. Historical collections of prairie pasqueflower in Saskatchewan. Data derived from the SASK herbarium (1920–2000); SK PlantWatch database (2001–2010) and author's field surveys (2011–2018).

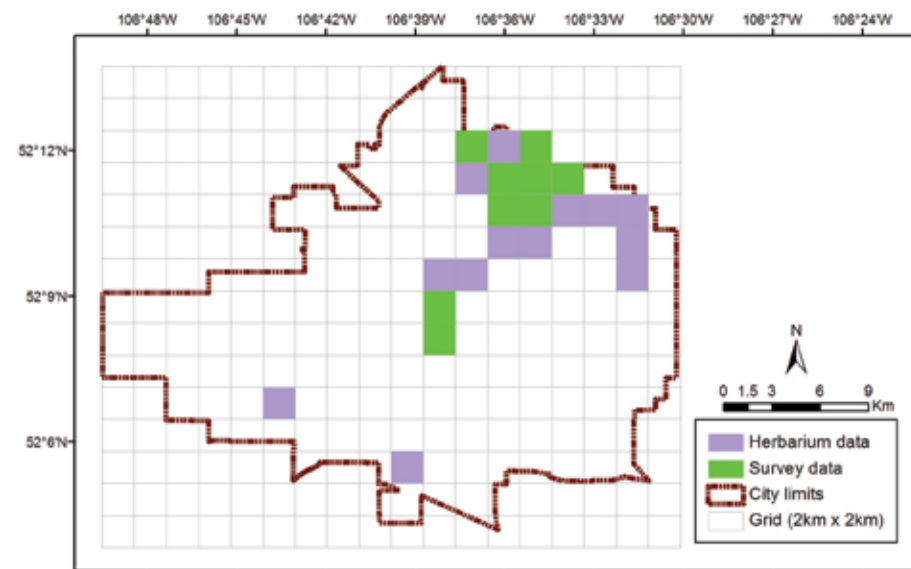


FIGURE 4. A distribution map of prairie pasqueflower in Saskatoon. (from Kricsfalussy et al. 20151). Note: information from primary sources about dates and names of observers is not available in the database.

TABLE 2. List of phenological observations (n=23) of prairie pasqueflower in Saskatchewan (SK PlantWatch database, 2001–2010).

LOCATION	ID	COORDINATES
Turtle Lake Nature Sanctuary	PW1	N53 36.422 W108 35.160
Tremblay	PW2	N51 35.391 W103 00.599
Township Road 482	PW3	N53 10.998 W109 46.998
South of Hwy 10	PW4	N50 32.046 W104 06.589
Round Lake	PW5	N53 21.131 W105 57.374
North side	PW6	N53 30.955 W105 45.730
Nisbet North	PW7	N53 12.890 W105 44.459
North-east Pinkerton	PW8	N51 49.999 W102 28.998
North-east of Leader	PW9	N50 53.993 W109 32.222
Lookout Point, Cypress Hills	PW10	N49 35.019 W109 29.930
Hjertaas 1	PW11	N49 34.002 W101 42.000
Harvey Zieger 2	PW12	N51 36.000 W109 30.000
Harvey Zieger 1	PW13	N51 55.828 W109 51.412
Gardener Rd. W	PW14	N53 12.433 W105 34.345
Flying Creek	PW15	N50 12.772 W104 54.333
Farmyard	PW16	N51 03.445 W103 06.470
Farmyard	PW17	N50 20.286 W102 52.422
Farmyard	PW18	N50 38.800 W103 49.183
Fairmount	PW19	N51 25.002 W109 18.000
Fahlman Acres	PW20	N53 12.276 W105 52.889
Daisy Meyers 1	PW21	N50 58.516 W109 59.230
Crocus Mountain	PW22	N53 15.990 W109 59.230
Ray's Lake	PW23	N53 32.685 W109 25.731

TABLE 3. List of occurrences (n=248) of prairie pasqueflower in Saskatchewan (author's field surveys, 2011–2018).

LOCATION	ID	AUTHOR	DATE	COORDINATES
Beaver Creek CA	BC1	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N51 58.814 W106 43.239
Beaver Creek CA	BC2	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N51 58.742 W106 43.094
Beaver Creek CA	BC3	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N51 58.715 W106 42.672
Beaver Creek CA	BC4	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N51 58.847 W106 42.693
Beaver Creek CA	BC5	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N51 58.747 W106 42.738
Beaver Creek CA	BC6	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N51 58.963 W106 42.838
Beaver Creek CA	BC7	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N51 58.847 W106 42.406
Beaver Creek CA	BC8	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N51 58.806 W106 43.230
Beaver Creek CA	BC9	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N51 58.807 W106 42.639
Borden	BO1	V. Kricsfalusy, R. Liu	09-May-18	N52 05.022 W107 10.614
Chief Whitecap Park	CWP1	V. Kricsfalusy, Y. Ponomarenko	19-May-11	N52 03.508 W106 43.308
Cranberry Flats CA	CF1	V. Kricsfalusy, Y. Ponomarenko	09-May-11	N52 01.974 W106 41.824
Cranberry Flats CA	CF2	V. Kricsfalusy, Y. Ponomarenko	09-May-11	N52 01.997 W106 41.877
Cranberry Flats CA	CF3	V. Kricsfalusy, Y. Ponomarenko	09-May-11	N52 02.005 W106 42.316
Cranberry Flats CA	CF4	V. Kricsfalusy, Y. Ponomarenko	09-May-11	N52 02.024 W106 42.372
Cranberry Flats CA	CF5	V. Kricsfalusy, Y. Ponomarenko	09-May-11	N52 02.078 W106 42.392
Cranberry Flats CA	CF6	V. Kricsfalusy, Y. Ponomarenko	09-May-11	N52 02.060 W106 42.433
Cranberry Flats CA	CF7	V. Kricsfalusy, Y. Ponomarenko	09-May-11	N52 02.001 W106 42.450
Cranberry Flats CA	CF8	V. Kricsfalusy, Y. Ponomarenko	19-May-11	N52 01.857 W106 41.735
Cranberry Flats CA	CF9	V. Kricsfalusy, Y. Ponomarenko	29-Jun-11	N52 01.935 W106 42.352
Cranberry Flats CA	CF10	V. Kricsfalusy, Y. Ponomarenko	29-Jun-11	N52 01.930 W106 42.375
Cranberry Flats CA	CF11	V. Kricsfalusy, Y. Ponomarenko	29-Jun-11	N52 02.006 W106 42.389
Cypress Hills IP	CH1	V. Kricsfalusy, Y. Ponomarenko	27-Jun-12	N49 37.200 W109 56.400
Cypress Hills IP	CH2	V. Kricsfalusy, Y. Ponomarenko	27-Jun-12	N49 37.800 W109 56.400
Cypress Hills IP	CH4	V. Kricsfalusy, Y. Ponomarenko	27-Jun-12	N49 37.800 W109 55.800
Cypress Hills IP	CH5	V. Kricsfalusy, Y. Ponomarenko	28-Jun-12	N49 39.000 W109 51.000
Cypress Hills IP	CH6	V. Kricsfalusy, Y. Ponomarenko	29-Jun-12	N49 38.400 W109 31.200
Cypress Hills IP	CH7	V. Kricsfalusy, Y. Ponomarenko	27-Jun-12	N49 39.000 W109 31.200
Cypress Hills IP	CH8	V. Kricsfalusy, Y. Ponomarenko	27-Jun-12	N49 38.999 W109 31.188
Cypress Hills IP	CH9	V. Kricsfalusy, Y. Ponomarenko	27-Jun-12	N49 40.800 W109 33.000
Prince Albert NP	PA1	V. Kricsfalusy, Y. Ponomarenko	15-Jun-12	N53 52.024 W106 08.469
Prince Albert NP	PA2	V. Kricsfalusy, Y. Ponomarenko	15-Jun-12	N53 13.416 W105 45.629
Prince Albert NP	PA3	V. Kricsfalusy, Y. Ponomarenko	15-Jun-12	N53 36.135 W106 31.151
Redberry Lake BR	RBL1	V. Kricsfalusy, Y. Ponomarenko	23-Jun-11	N52 40.203 W107 13.943
Redberry Lake BR	RBL2	V. Kricsfalusy, Y. Ponomarenko	23-Jun-11	N52 40.218 W107 13.742
Redberry Lake BR	RBL3	V. Kricsfalusy, Y. Ponomarenko	23-Jun-11	N52 43.282 W107 12.727
Redberry Lake BR	RBL4	V. Kricsfalusy, Y. Ponomarenko	23-Jun-11	N52 42.456 W107 13.374
Redberry Lake BR	RBL5	V. Kricsfalusy, Y. Ponomarenko	19-Jul-11	N52 50.547 W107 39.644
Redberry Lake BR	RBL6	V. Kricsfalusy, Y. Ponomarenko	19-Jul-11	N52 50.458 W107 39.766
RM Redberry, Hawrysh Farm	HP1	V. Kricsfalusy, Y. Ponomarenko	23-Jun-11	N52 36.249 W107 15.294
RM Redberry, Hawrysh Farm	HP2	V. Kricsfalusy, Y. Ponomarenko	24-Jun-11	N52 36.197 W107 15.217
Saskatoon, Agra Road	AR1	V. Kricsfalusy, Y. Ponomarenko	05-May-12	N52 10.294 W106 35.570
Saskatoon, Agra Road	AR2	V. Kricsfalusy, Y. Ponomarenko	05-May-12	N52 10.239 W106 35.494
Saskatoon, Agra Road	AR3	V. Kricsfalusy, Y. Ponomarenko	05-May-12	N52 10.180 W106 35.427
Saskatoon, Agra Road	AR4	V. Kricsfalusy, Y. Ponomarenko	05-May-12	N52 10.158 W106 35.550
Saskatoon, Agra Road	AR5	V. Kricsfalusy, Y. Ponomarenko	05-May-12	N52 10.321 W106 35.625
Saskatoon, Agra Road	AR6	V. Kricsfalusy, Y. Ponomarenko	05-May-12	N52 10.368 W106 34.605
Saskatoon, Agra Road	AR7	V. Kricsfalusy, Y. Ponomarenko	05-May-12	N52 10.354 W106 34.687
Saskatoon, Agra Road	AR8	V. Kricsfalusy, Y. Ponomarenko	05-May-12	N52 10.366 W106 34.756
Saskatoon, Agra Road	AR9	V. Kricsfalusy, Y. Ponomarenko	05-May-12	N52 10.336 W106 34.822
Saskatoon, Agra Road	AR10	V. Kricsfalusy, Y. Ponomarenko	05-May-12	N52 10.298 W106 34.888
Saskatoon, Agra Road	AR11	V. Kricsfalusy, Y. Ponomarenko	05-May-12	N52 10.231 W106 35.136
Saskatoon, Crocus Prairie	CP1	V. Kricsfalusy, Y. Ponomarenko	05-Jul-12	N52 09.823 W106 36.365
Saskatoon, Crocus Prairie	CP2	V. Kricsfalusy, Y. Ponomarenko	05-Jul-12	N52 09.934 W106 36.316
Saskatoon, Crocus Prairie	CP3	V. Kricsfalusy, Y. Ponomarenko	05-Jul-12	N52 09.903 W106 36.257
Saskatoon, Kernen Prairie	KP1	V. Kricsfalusy, Y. Ponomarenko	13-May-11	N52 09.593 W106 31.714
Saskatoon, Kernen Prairie	KP2	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N52 09.592 W106 31.824
Saskatoon, Kernen Prairie	KP3	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N52 09.549 W106 31.908
Saskatoon, Kernen Prairie	KP4	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N52 09.543 W106 31.993
Saskatoon, Kernen Prairie	KP5	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N52 09.582 W106 31.977
Saskatoon, Kernen Prairie	KP6	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N52 09.631 W106 31.998
Saskatoon, Kernen Prairie	KP7	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N52 09.673 W106 31.934
Saskatoon, Kernen Prairie	KP8	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N52 09.694 W106 31.812
Saskatoon, Kernen Prairie	KP9	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N52 09.665 W106 31.706
Saskatoon, Kernen Prairie	KP10	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N52 10.308 W106 31.964
Saskatoon, Kernen Prairie	KP11	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N52 10.214 W106 31.934
Saskatoon, Kernen Prairie	KP12	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N52 10.166 W106 31.933
Saskatoon, Kernen Prairie	KP13	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N52 10.099 W106 31.949
Saskatoon, Kernen Prairie	KP14	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N52 09.955 W106 31.812
Saskatoon, Kernen Prairie	KP15	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N52 09.890 W106 32.139
Saskatoon, Kernen Prairie	KP16	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N52 09.939 W106 32.184
Saskatoon, Kernen Prairie	KP17	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N52 10.040 W106 32.282
Saskatoon, Kernen Prairie	KP18	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N52 10.073 W106 32.217
Saskatoon, Kernen Prairie	KP19	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N52 10.120 W106 32.185
Saskatoon, Kernen Prairie	KP20	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N52 10.357 W106 32.052
Saskatoon, Kernen Prairie	KP21	V. Kricsfalusy, Y. Ponomarenko	11-May-11	N52 10.352 W106 31.964
Saskatoon, Northeast Swale	NS1	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.335 W106 35.863
Saskatoon, Northeast Swale	NS2	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.257 W106 35.824
Saskatoon, Northeast Swale	NS3	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.255 W106 35.747
Saskatoon, Northeast Swale	NS4	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.314 W106 35.700
Saskatoon, Northeast Swale	NS5	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.355 W106 35.758
Saskatoon, Northeast Swale	NS6	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.430 W106 34.437
Saskatoon, Northeast Swale	NS7	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.477 W106 34.368

LOCATION	ID	AUTHOR	DATE	COORDINATES
Saskatoon, Northeast Swale	NS8	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.498 W106 34.264
Saskatoon, Northeast Swale	NS9	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.528 W106 34.217
Saskatoon, Northeast Swale	NS10	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.572 W106 34.186
Saskatoon, Northeast Swale	NS12	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.768 W106 34.032
Saskatoon, Northeast Swale	NS13	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.827 W106 34.077
Saskatoon, Northeast Swale	NS14	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.812 W106 33.906
Saskatoon, Northeast Swale	NS15	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.601 W106 33.852
Saskatoon, Northeast Swale	NS16	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.568 W106 33.987
Saskatoon, Northeast Swale	NS17	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.554 W106 34.053
Saskatoon, Northeast Swale	NS18	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.458 W106 34.285
Saskatoon, Northeast Swale	NS19	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.823 W106 33.463
Saskatoon, Northeast Swale	NS20	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.800 W106 33.580
Saskatoon, Northeast Swale	NS21	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.759 W106 33.627
Saskatoon, Northeast Swale	NS22	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.821 W106 33.633
Saskatoon, Northeast Swale	NS23	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.819 W106 33.718
Saskatoon, Northeast Swale	NS24	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.834 W106 33.781
Saskatoon, Northeast Swale	NS25	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 10.931 W106 33.824
Saskatoon, Northeast Swale	NS26	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 11.036 W106 33.834
Saskatoon, Northeast Swale	NS27	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 11.049 W106 33.696
Saskatoon, Northeast Swale	NS28	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 11.117 W106 33.660
Saskatoon, Northeast Swale	NS29	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 11.228 W106 33.637
Saskatoon, Northeast Swale	NS30	V. Kricsfalusy, Y. Ponomarenko	25-May-11	N52 11.291 W106 33.508
Saskatoon, Northeast Swale	NS31	V. Kricsfalusy, Y. Ponomarenko	07-Jul-11	N52 11.440 W106 33.349
Saskatoon, Northeast Swale	NS32	V. Kricsfalusy, Y. Ponomarenko	07-Jul-11	N52 10.625 W106 34.059
Saskatoon, Northeast Swale	NS33	V. Kricsfalusy, Y. Ponomarenko	07-Jul-11	N52 10.799 W106 34.078
Saskatoon, Northeast Swale	NS34	V. Kricsfalusy, Y. Ponomarenko	07-Jul-11	N52 10.841 W106 33.850
Saskatoon, Northeast Swale	NS35	V. Kricsfalusy, Y. Ponomarenko	15-May-12	N52 10.826 W106 34.464
Saskatoon, Northeast Swale	NS36	V. Kricsfalusy, Y. Ponomarenko	15-May-12	N52 10.810 W106 34.382
Saskatoon, Northeast Swale	NS37	V. Kricsfalusy, Y. Ponomarenko	15-May-12	N52 10.853 W106 34.346
Saskatoon, Northeast Swale	NS38	V. Kricsfalusy, Y. Ponomarenko	15-May-12	N52 10.895 W106 34.279
Saskatoon, Northeast Swale	NS39	V. Kricsfalusy, Y. Ponomarenko	15-May-12	N52 10.955 W106 34.170
Saskatoon, Northeast Swale	NS40	V. Kricsfalusy, Y. Ponomarenko	15-May-12	N52 10.994 W106 34.131
Saskatoon, Northeast Swale	NS41	V. Kricsfalusy, Y. Ponomarenko	15-May-12	N52 10.988 W106 33.984
Saskatoon, Northeast Swale	NS42	V. Kricsfalusy, Y. Ponomarenko	15-May-12	N52 11.106 W106 33.940
Saskatoon, Northeast Swale	NS43	V. Kricsfalusy, Y. Ponomarenko	15-May-12	N52 11.213 W106 33.840
Saskatoon, Northeast Swale	NS44	V. Kricsfalusy, Y. Ponomarenko	15-May-12	N52 11.152 W106 33.813
Saskatoon, Northeast Swale	NS45	V. Kricsfalusy, Y. Ponomarenko	15-May-12	N52 10.980 W106 33.931
Saskatoon, Northeast Swale	NS46	V. Kricsfalusy, Y. Ponomarenko	15-May-12	N52 10.955 W106 33.956
Saskatoon, Northeast Swale	NS47	V. Kricsfalusy, Y. Ponomarenko	15-May-12	N52 10.907 W106 33.972
Saskatoon, Northeast Swale	NS48	V. Kricsfalusy, Y. Ponomarenko	15-May-12	N52 10.925 W106 34.082
Saskatoon, Northeast Swale	NS49	V. Kricsfalusy, Y. Ponomarenko	15-May-12	N52 10.869 W106 34.158
Saskatoon, Northeast Swale	NS50	V. Kricsfalusy, Y. Ponomarenko	15-May-12	N52 10.937 W106 34.248
Saskatoon, Peggy McKercher	MK1	V. Kricsfalusy, J. Esparrago	17-May-11	N52 11.099 W106 36.014
Saskatoon, Peggy McKercher	MK2	V. Kricsfalusy, J. Esparrago	17-May-11	N52 11.001 W106 35.955
Saskatoon, Peggy McKercher	MK3	V. Kricsfalusy, J. Esparrago	17-May-11	N52 10.947 W106 35.951
Saskatoon, Petturrson's Ravine	PR1	V. Kricsfalusy, J. Esparrago	15-May-11	N52 10.013 W106 36.355
Saskatoon, Petturrson's Ravine	PR2	V. Kricsfalusy, J. Esparrago	15-May-11	N52 09.995 W106 36.357
Saskatoon, Petturrson's Ravine	PR3	V. Kricsfalusy, J. Esparrago	15-May-11	N52 10.199 W106 36.194
Saskatoon, Petturrson's Ravine	PR4	V. Kricsfalusy, J. Esparrago	15-May-11	N52 10.081 W106 36.032
Saskatoon, Petturrson's Ravine	PR5	V. Kricsfalusy, J. Esparrago	15-May-11	N52 10.113 W106 35.986
Saskatoon, Range Road	RR1	V. Kricsfalusy, Y. Ponomarenko	05-May-12	N52 12.294 W106 35.829
Saskatoon, Range Road	RR2	V. Kricsfalusy, Y. Ponomarenko	05-May-12	N52 12.151 W106 35.915
Saskatoon, Range Road	RR3	V. Kricsfalusy, Y. Ponomarenko	05-May-12	N52 11.939 W106 35.741
Saskatoon, Range Road	RR4	V. Kricsfalusy, Y. Ponomarenko	05-May-12	N52 11.620 W106 35.790
Saskatoon, Range Road	RR5	V. Kricsfalusy, Y. Ponomarenko	05-May-12	N52 10.898 W106 35.816
Saskatoon Natural Grasslands	SNG1	V. Kricsfalusy, Y. Ponomarenko	14-May-11	N52 09.697 W106 35.439
Saskatoon Natural Grasslands	SNG2	V. Kricsfalusy, Y. Ponomarenko	14-May-11	N52 09.763 W106 35.450
Saskatoon Natural Grasslands	SNG3	V. Kricsfalusy, Y. Ponomarenko	14-May-11	N52 09.741 W106 35.494
Saskatoon Natural Grasslands	SNG4	V. Kricsfalusy, Y. Ponomarenko	14-May-11	N52 09.783 W106 35.502
Saskatoon Natural Grasslands	SNG5	V. Kricsfalusy, Y. Ponomarenko	14-May-11	N52 09.807 W106 35.538
Saskatoon Natural Grasslands	SNG6	V. Kricsfalusy, Y. Ponomarenko	14-May-11	N52 09.839 W106 35.561
Saskatoon Natural Grasslands	SNG7	V. Kricsfalusy, Y. Ponomarenko	14-May-11	N52 09.858 W106 35.620
Saskatoon Natural Grasslands	SNG8	V. Kricsfalusy, Y. Ponomarenko	14-May-11	N52 09.883 W106 35.595
Saskatoon Natural Grasslands	SNG9	V. Kricsfalusy, Y. Ponomarenko	14-May-11	N52 09.835 W106 35.420
Saskatoon Natural Grasslands	SNG10	V. Kricsfalusy, Y. Ponomarenko	14-May-11	N52 09.806 W106 35.421
Saskatoon Natural Grasslands	SNG11	V. Kricsfalusy, Y. Ponomarenko	14-May-11	N52 09.854 W106 35.294
Saskatoon Natural Grasslands	SNG12	V. Kricsfalusy, Y. Ponomarenko	14-May-11	N52 09.927 W106 35.669
Saskatoon Natural Grasslands	SNG14	V. Kricsfalusy, Y. Ponomarenko	14-May-11	N52 09.972 W106 35.629
Saskatoon Natural Grasslands	SNG15	V. Kricsfalusy, Y. Ponomarenko	14-May-11	N52 10.017 W106 35.630
Saskatoon Natural Grasslands	SNG16	V. Kricsfalusy, Y. Ponomarenko	14-May-11	N52 09.927 W106 35.864
Saskatoon Natural Grasslands	SNG17	V. Kricsfalusy, Y. Ponomarenko	14-May-11	N52 09.877 W106 35.859
Saskatoon Natural Grasslands	SNG18	V. Kricsfalusy, Y. Ponomarenko	14-May-11	N52 09.966 W106 35.622
Saskatoon Natural Grasslands	SNG19	V. Kricsfalusy, Y. Ponomarenko	14-May-11	N52 09.774 W106 35.488
Saskatoon, Small Swale	SS1	V. Kricsfalusy, S. Zhao	06-Jun-13	N52 11.134 W106 35.841
Saskatoon, Small Swale	SS2	V. Kricsfalusy, S. Zhao	06-Jun-13	N52 11.351 W106 35.438
Saskatoon, Small Swale	SS3	V. Kricsfalusy, S. Zhao	06-Jun-13	N52 11.486 W106 35.270
Saskatoon, Small Swale	SS4	V. Kricsfalusy, S. Zhao	06-Jun-13	N52 11.524 W106 35.049

STEWARDS OF SASKATCHEWAN STAFF UPDATE

Each summer, the Stewards of Saskatchewan (SOS) staff are busy connecting with land stewards, surveying for species at risk, and promoting awareness of our disappearing prairie parkland landscapes and their biological diversity. This work is supported by hard working summer staff and, in 2019, we are very pleased to welcome Levi Boutin, Grace Schaan, Michelle Lang, Josh Christiansen and Natanis Kuster to the SOS team.

Levi Boutin grew up in Regina and spent much of his youth camping with his family throughout the Prairie provinces, where his love of nature began. Inspired by his hobbies of camping, hiking, nature photography, and wild herbalism, he attended Lakeland College in Vermilion, Alberta and received a diploma in Conservation & Restoration Ecology. He then continued on to finish an Environmental Biology degree at the University of Regina in 2018. Throughout the years, he has explored the realm of conservation through various organizations, which have solidified his love for native prairie rangeland and the dedicated people who manage it. Levi feels the pressure to keep our prairies healthy and functional for many years to come, and is eager to continue contributing to this effort. He is excited to come back to Nature Saskatchewan for his second summer of exploring the hidden gems of Saskatchewan, whether it's the delicious diners or the breathtaking views of bubbling creeks and rolling hills of golden grass.



Grace Schaan grew up in Regina and enjoyed spending time each summer at Wakaw Lake. She has fond memories of camping with her family around southern Saskatchewan as a child, as well as visiting many national parks in Western Canada. She has especially enjoyed a number of canoe trips, including two on the South Saskatchewan River, two in Prince Albert National Park, and one through the Qu'Appelle Valley. Grace's other hobbies include hiking, travelling, listening to music, and advocating for a number of environmental issues. In winter 2018, Grace completed an ISEP study abroad semester in New Zealand where she was a member of the Massey University Alpine Club. She is now entering her fourth year of Environmental Studies at the University of Regina and is also working toward a minor in French and Francophone Intercultural Studies. She looks forward to contributing to the conservation of Saskatchewan's unique environment.



Michelle Lang was born and raised in Regina, Saskatchewan. Growing up, she quickly learned that her favourite place to be was outside and she took every opportunity she could to go camping and spend time at family farms. Her love of nature led her to complete a B.Sc. in Environmental Biology in 2016. After completing her degree, Michelle's diverse interests led her to pursue a variety of careers from agriculture to water quality monitoring, dendrochronology, and now conservation. She first worked for Nature Saskatchewan in 2017 as a Rare Plant Rescue Search Technician and returned back for a second term this past January to work as a Habitat Stewardship Assistant. Through these positions, Michelle has been very lucky to meet many amazing landowners, see a variety of prairie species, and experience rural Saskatchewan. She is very excited to switch roles again this summer and spend time working as an Assistant for the Rare Plant Rescue program — connecting with more people around the province and dusting off her camera to take pictures of all the amazing scenery and wildlife!



Josh Christiansen was born and raised in Regina, Saskatchewan and spent his childhood summers at Crystal Lake. Josh has always been in love with nature. At an early age, his grandfather would take him on early morning bird watching expeditions and it was these experiences that instilled a passion for the environment that has followed Josh throughout his life. Josh attended Luther College High School where he studied environmental studies and was lucky enough to travel to northern Saskatchewan, Grasslands National Park and the Bamfield Marine Sciences Centre where his dream of becoming a marine biologist began. Josh now attends the University of Regina and is pursuing a Bachelor of Science degree, concentrating in environmental biology. Josh also loves photography and is an avid artist, capturing the beauty of the natural world in his drawings and paintings. He continues to enjoy the outdoors, playing a lot of Ultimate Frisbee and spending as much time as he can exploring Saskatchewan's unique ecosystems.



Natanis Kuster was born and raised in Regina, Saskatchewan. She has always had a passion for wildlife and nature. Over the years, her love for the outdoors grew as she and her family embarked on camping adventures during the summers. Her passion continued into her education as she is pursuing a biology degree with concentration in ecological and environmental biology. She will be going into her fourth year at the University of Regina in the fall. Aside from spending time outdoors hiking and watching wildlife, you can catch Natanis coaching volleyball, watching or playing sports, and baking. Wanting to pursue a career in nature conservation after completion of her degree, she is very excited and thankful for the opportunity to work with Nature Saskatchewan and have an active role in conserving and learning about the beautiful land that she is lucky enough to call home. 🐦



Eurasian Collared Doves. All photos courtesy of Donna Firby Gamache.

EURASIAN COLLARED-DOVE: INVADER SPREADS ACROSS THE WEST

Donna Firby Gamache
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MacGregor, MB R0H 0R0
lucgam@mymts.net

Alien invaders in your backyard? Last winter I saw three from my window, and I was pleased to see them, for they weren't from outer space. Instead, these invaders were Eurasian Collared-Doves (*Streptopelia decaocto*), which are spreading across the United States (except in the New England area) and southwestern Canada.

I first saw these three doves in my yard at the beginning of February 2018 and they visited all winter, usually feeding on the ground under our sheltered bird feeder. On cold winter days, they rested in the sun or

on the nearby wooden fence.

The Eurasian Collared-Dove first arrived in the New World in the 1970s. Some were brought as pets to the Bahamas where some escaped from a pet store, while others were deliberately set free. By the 1980s, they had reached south Florida and from there began their spread in a north-westerly direction across the U.S. (apparently avoiding the northeast part of the U.S.). They became the fastest-spreading invasive avian species known so far. These doves have now been sighted all the way to Alaska. They are one of the great colonizers of the world, having previously spread from southeast Asia throughout Europe.

While the three birds I saw last winter provided my first sighting

of Eurasian Collared-Doves in MacGregor, Manitoba, birders had reported them in nearby Portage la Prairie for the previous two years during both summer and winter. The collared-doves were present in my yard all last winter and three or four stayed over the summer. Although I did not locate a nest, frequent sightings of a pair in spruce trees two houses away convinced me that they were nesting there. We also heard their distinctive calls often, particularly in the evening. By late summer, four or five were frequently seen on hydro wires and fences.

Information from the *Atlas of the Breeding Birds of Manitoba* indicates that the Eurasian Collared-Dove was officially added to the Manitoba bird list in May 2003, when a bird



was present in Holland.¹ In the years when the atlas was compiled (2010-2014), the species was counted in 22 squares (2% of the Prairie Potholes), all from the Red River valley west and mostly within 100 km of the U.S. border. Since then, there have been increased populations in a few spots, such as Portage la Prairie and Glenboro. In other areas, the birds have disappeared. A few southern Saskatchewan towns such as Weyburn and Mortlach "have generally reported robust populations". The largest Christmas Bird Count tally in that province was 116 at Moose Jaw in 2009.² The first records, for Saskatchewan as well as Canada as a whole, were at Langham and Last Mountain Bird Observatory in 1998.²

The most recent unofficial information available so far from the Manitoba 2018 Christmas Bird Count shows Eurasian Collared-Doves in only a few counts, but a surprising number of birds (45) were counted in Cypress River on December 21, as reported by Ken de Smet (apparently one birder there is feeding at least 35

on a regular basis). Slightly larger and chunkier than our native Mourning Dove (*Zenaida macroura*), the collared-dove is grayish-beige, with a narrow, black half-collar edged with white around the back of the neck (see photos). In juveniles, this collar is sometimes less noticeable. The undertail is largely white, especially visible when it flies, and the wings are dark-tipped. It lacks the black spots common on the wings and sides of the Mourning Dove.

The collared-dove's call is a three-syllable *coo-COO-coo*, shorter and repeated more frequently than Mourning Doves, often five to 12 times in a row (by contrast, the Mourning Dove's call is usually five syllables: *coo-ah, coo, coo, coo*, with longer intervals in between calls). Collared-doves are ground feeders and, unlike native doves, do not migrate, so in winter they frequent yards with birdfeeders, or farmyards.

Some bird-lovers fear the Eurasian Collared-Dove might have a negative impact on Mourning Doves in the same way as the House Sparrow (*Passer domesticus*) and the



European Starling (*Sturnus vulgaris*) have been blamed for decreases in native songbirds. But so far research indicates that the native population actually seems to be greater when they coexist with collared-doves. A 2010 study found that in North America, the site-level abundance of four other dove species all increased with Eurasian Collared-Dove abundance throughout that study's sampling period, 1999-2008.³

Watch for this new 'invader' in your own area. For more information and pictures, see:

https://www.allaboutbirds.org/guide/Eurasian_Collared-Dove/id

1. Koes RF, Parsons RJ (2018). Eurasian Collared-Dove in Artuso C, Couturier AR, De Smet KD, Koes, RF, Lepage D, McCracken J, Mooi R, Taylor P (Eds). *Atlas of the Breeding Birds of Manitoba, 2010-2014*. Bird Studies Canada. Winnipeg, Manitoba. <http://www.birdatlas.mb.ca/accounts/speciesaccount.jsp?sp=ECDO&lang=en> [04 Jan 2019]
2. Smith AR, Houston CS, Roy F (Eds) (2019). *Birds of Saskatchewan*. Nature Saskatchewan.
3. Bonter DN, Zuckerberg B, Dickinson JL. 2010. Invasive birds in a novel landscape: habitat associations and effects on established species. *Ecography* 33: 494-502. 🐦

JUNE 14-16, 2019 EASTEND, SK

Friday, June 14

Refreshments will be available; coffee, tea, meat/cheese/crackers, veggies

6:30 p.m. Registration
at T-Rex Discovery Centre

7:30 p.m. Prairie Commons Project
presented by Katie Doke
Sawatzky, 2018 Nature Saskatchewan Margaret Skeel Graduate Student Scholarship Winner

Saturday, June 15

Breakfast provided at 7:00 a.m. at Eastend Memorial Hall

8:00 a.m. Tour
Load buses at Eastend Memorial Hall. Tour through the Frenchman valley toward Ravenscrag for sightseeing and birding followed by a stop for bluebird banding and a visit to Cypress Lake.

12:00 p.m. Lunch
Lunch break in Consul

1:00 p.m. Tour
Tour to Govenlock/Nashlyn/Battlecreek pasture

6:30 p.m. Banquet

7:30 p.m. Program
"Protected Places Program, Nature Fund, Future Management of Govenlock/Nashlyn/Battle Creek Pastures" – presented by Canadian Wildlife Service.

Sunday, June 16

Breakfast on your own

9:00 a.m. Annual General Meeting
at Eastend town hall

*REGISTRATION (including cost)
ON NEXT PAGE*

Suggested Accommodations

Riverside Motel
Phone: 306-295-3630

Cypress Hotel
Phone: 306-295-3505 (only accepts bookings one month in advance; May 14)

Town of Eastend Campground
First come, first served basis

Canalta Hotel – Shaunavon
Phone: 888-347-2319
Please mention Nature Saskatchewan when booking.

JUNE 14-16, 2019 EASTEND, SK

REGISTRATION FORM

Name(s): _____

Address: _____

Postal Code: _____

Telephone: _____

Email: _____

Spring Meet Fees (*Includes breakfast on Saturday, lunch on Saturday and supper on Saturday evening).

Member Early Registration Fee
(prior to May 25): **\$90 x** _____ = \$ _____

Member Late Registration Fee
(after May 25): **\$105 x** _____ = \$ _____

Non-Member Early Registration Fee
(prior to May 25) : **\$105 x** _____ = \$ _____

Non-Member Late Registration Fee
(after May 25): **\$120 x** _____ = \$ _____

Youth (16 and under) Registration Fee
\$75 x _____ = \$ _____

Additional Banquet Tickets
\$25/ticket x _____ = \$ _____

TOTAL AMOUNT DUE: \$ _____

Payment by Visa/Mastercard:
Card #: _____/_____/_____/_____
exp: _____/_____

Payment by Cheque:
Make cheque payable to Nature Saskatchewan

Mail, e-mail or call our office to register for the 2019 Spring Meet:

Nature Saskatchewan
206-1860 Lorne Street
Regina, SK S4P 2L7
info@nauresask.ca
1-800-667-4668 or (306) 780-9273

Do you have any dietary needs or allergies (please circle)?

YES or NO

IF YES, what are they? _____

#206 - 1860 Lorne St
Regina, SK S4P 2L7



Without your voice, ours becomes a whisper.
Help us protect Saskatchewan's ecosystems and wildlife.

Name: _____
Address: _____ City: _____
Province: _____ Postal Code: _____ Phone: _____
E-mail: _____
Would you like to subscribe to all electronic communications? Yes
Would you like to receive our e-newsletter? Yes

1. I wish to enroll/renew my annual membership
* All memberships run on a calendar of January 1st - December 31st

	Print Version	Electronic Version
Individual	<input type="checkbox"/> \$40	<input type="checkbox"/> \$25
Family	<input type="checkbox"/> \$45	<input type="checkbox"/> \$30
Student	<input type="checkbox"/> \$35	<input type="checkbox"/> \$25
Senior 65+	<input type="checkbox"/> \$35	<input type="checkbox"/> \$25
Foreign/Outside Canada	<input type="checkbox"/> \$60	<input type="checkbox"/> \$30
Institution/Business (CDN)	<input type="checkbox"/> \$60	<input type="checkbox"/> \$30

*I would like to purchase a Life Membership (You will receive a tax receipt for \$725) \$750
 Print OR Electronic

2. I wish to make a one time tax-deductible donation in support of:

- General Programs
- Scholarship Fund
- Land Conservation Fund
- Nature Legacy Fund
- Last Mountain Bird Observatory
- Bird Species at Risk Programs (OBO/SFS/POS)
- Rare Plant Rescue Program

Donate Online @ www.naturesask.ca/support

3. I wish to become a monthly donor by joining the Nature Savings Plan:
(Income tax receipts are issued annually-- please provide credit card information or void cheque)
Amount: \$ _____

Fee Totals	
Nature Saskatchewan Membership	\$ _____
Nature Saskatchewan Donation	\$ _____
Total	\$ _____

Cheque (payable to Nature Saskatchewan) Visa MasterCard Cash
Card # ____/____/____/____ Expiry: _____
Cardholder's Name: _____ Signature: _____

NATURE SASKATCHEWAN FUNDERS LISTING 2018-19 FISCAL YEAR THANK YOU TO OUR FUNDERS!

**SASKATCHEWAN
CONSERVATION DATA CENTRE**

- Saskatchewan Ministry of Environment
- Nature Serve (Parks Canada/ Canadian Wildlife Service)
- Schad Foundation
- South of the Divide Conservation Action Plan
- Resources Legacy Fund (U.S)

GENERAL

- SaskCulture

IMPORTANT BIRD AREAS

- SaskEnergy
- Saskatchewan Ministry of Environment (Fish and Wildlife Development Fund)
- Nature Canada
- Canada Career Focus Green Corps

NATUREQUEST

- SaskEnergy

NATUREHOOD

- Nature Canada
- Ducks Unlimited

INNER NATURE

- SIGA (Saskatchewan Indian Gaming Authority)

NATURE LEGACY FUND

- Derril McLeod Family Foundation Fund at the South Sask. Community Foundation

**LAST MOUNTAIN BIRD
OBSERVATORY**

- Saskatchewan Ministry of Environment (Fish and Wildlife Development Fund)
- Environment and Climate Change Canada (Canadian Wildlife Service)
- Murray & Edna Forbes Foundation at the Sask. South Community Foundation
- Bird Studies Canada (Great Canadian Birdathon)
- Canada Career Focus Green Corps
- Eco Friendly Sask

**STEWARDS OF
SASKATCHEWAN PROGRAMS**

- Government of Canada – Federal Department of Environment and Climate Change/
- Gouvernement du Canada – ministere federal de l'Environnement et du Changement climatique
- The Mosaic Company
- Neotropical Migratory Bird Conservation Act Program, US Fish and Wildlife Service
- SaskTel
- The Elsa Wild Animal Appeal of Canada
- Enbridge
- Fish and Wildlife Development Fund, Saskatchewan Ministry of Environment
- Saskatchewan Conservation Data Centre
- Canada Saskatchewan Job Grant
- Mitacs, Government of Canada

POETRY

Lifted

In a common shopping mall
Rushed on an errand
Focused on my task, on time
My eye was caught, diverted
By a strange and beautiful thing.

A monarch butterfly fluttered, lifted
Itself above all 'round it
It lighted in my path
Its strong, light wings fanning
Antennae reaching, feeling.

It captured me, stopped me
Delayed me, no doubt in that
It was more of the moment
Its life, its fate, the moment.

If faith can lift us up
If our better angels
Can move us to mountains
That startling, perfect flyer
Will soar on southbound winds.

In Mexico's green mountains
That perfect fragment of life
Will launch far from this drab spot
To throng with pulsing legions
Of his tough, celestial kind.

George Grassick
P.O. Box 205
Lumsden, SK S0G 3C0
ggrassick@sasktel.net

NATURE SASKATCHEWAN AWARDS:

Each year at the Fall Meet, Nature Saskatchewan recognizes outstanding service and contributions that Society members, and/or affiliate and partner organizations have made towards Nature Saskatchewan's objectives and goals.

Clear criteria have been established in terms of purpose, eligibility, and nomination procedure. This year, we are seeking nominations for three classes of awards – **Volunteer Recognition Award, Fellows Award, and Conservation Award.**

The Volunteer Recognition Award and Conservation Award can be conferred on the same individual or organization more than once.

The Cliff Shaw Award will also be presented at the Fall Meet. The recipient is chosen by the *Blue Jay* editor.

Local societies throughout Saskatchewan play an important role in furthering conservation and appreciation of nature at the local level. There are always those who step up to the plate to organize meetings and outings, go the extra mile to help others connect with nature, or work silently and tirelessly behind the scenes. It's time those contributions were recognized. We encourage anyone from a local society to consider nominating someone from your local group who is a Nature Saskatchewan member, who deserves recognition for any of these awards. Note that nominees for the Volunteer Recognition Award and Fellows Award must hold a current membership with Nature Saskatchewan.

The deadline to submit nominations for awards is August 23, 2019.

All Nature Saskatchewan Awards consist of the following:

- The announcement of the recipient's name at the Fall Meet.
- The presentation of a certificate recognizing the contribution.
- An announcement in *Blue Jay* recognizing the distinction.

Nomination Procedure

The nomination procedure is the same for all three awards. The criteria and names of past recipients can be found on the website at www.naturesask.ca/what-we-do/awards. The office can also send you a copy by mail, if you prefer.

- Nominations can be made by Nature Saskatchewan members, directors, and staff. Local societies should consider nominating someone from their local group.
- Self-nominations will not be accepted.
- Nominations are to be made in writing and submitted by the published deadline.
- Nominations are to include the following information: The nominee's name, address, and phone number; the nominator's name and contact information; details of the nominee's efforts.
- The Awards Committee will independently rate the nominations, and confirm that the nominee holds a current membership with Nature Saskatchewan.
- Chairperson of the Awards Committee will bring the recommendations to the Board.
- If ratified, the President or his/her delegate shall confer the respective Awards to the recipients at the Fall Meet.

VOLUNTEER RECOGNITION AWARD

This award was created in 1996 to acknowledge an individual Nature Saskatchewan member who has devoted significant time and energy to promoting the objectives of the Society, including contributions made at the local society level. Priority for this award will be given to a Nature Saskatchewan member whose volunteer work has helped to enhance the public awareness of the Society (this may include contributions to a Society conservation project or program). It may be appropriate in some years to have this award shared by more than one person, if they have worked together on the same project, or on closely related projects.

Eligibility

Nature Saskatchewan members who have provided valuable time and effort in contributing to the Society are eligible. Local societies are encouraged to nominate someone from their local group who is a Nature Saskatchewan member, recognizing that Nature Saskatchewan values their contributions to the overall goals of the Society. The nominee must be a current member of Nature Saskatchewan. This award can be conferred on the same person more than once.

CALL FOR NOMINATIONS

FELLOWS AWARD

A motion was passed at the 1987 Annual General Meeting creating a new class of honorary membership entitled "Fellows of the Saskatchewan Natural History Society". This award recognizes an extensive and continuing contribution of time over many years to the Society and its objectives. Up to five recipients may be chosen annually. Once selected, Fellows hold that title as long as they remain members of the Society. It is the highest honour the Society can bestow upon a member.

Eligibility

Eligible individuals are members of Nature Saskatchewan who have provided an outstanding time and work contribution to the Society over many years. These contributions have been significant, and may have come in the form of leadership, communication, authorship, social media outreach, research and other areas. The contributions have been cumulative or ongoing, and represent long-standing service or commitment to Nature Saskatchewan and its objectives.

CALLING ALL PHOTOGRAPHERS LARRY MORGOTCH IMAGES OF NATURE EVENT NATURE SASKATCHEWAN FALL MEET

Any member attending the Nature Saskatchewan Fall Meet may show up to 10 images that illustrate natural history interests and activities, and may speak briefly about them (no longer than two minutes, please). Images labelled with your name should be left with the projectionist before the start of the program. Digital images may be individual files, assembled as a PowerPoint or similar type of presentation, or an executable file if you are using a slideshow editing program.

CONSERVATION AWARD

In addition to advocacy and other forms of conservation action, it is important that Nature Saskatchewan recognize, as it has done since 1953, those both within and beyond the organization who have done "meritorious work in the interest of conservation in Saskatchewan."

Nature Saskatchewan's Conservation Award will be presented to an individual or organization whose total contribution to conservation is outstanding, whether in relation to a particular project or in a number of roles over a period of years.

Eligibility

Individuals, affiliate and/or partner organizations, not-for-profit associations, institutions, community groups, businesses, government and non-government organizations that have contributed significantly to conservation in Saskatchewan.

This award can be conferred on the same individual or organization more than once.

Please be sure your presentation runs on a standard PC. Name your images so that they display in the correct order. Digital images should be stored in a folder indicating your name and saved on a USB flash drive.

We'll have a computer and digital projector already set up.

Here's a chance to showcase some of your favourite images of nature without pressure of competition!

CALL FOR RESOLUTIONS

The resolutions considered during the Business Meeting at each year's Fall Meet are important expressions of member concerns on environmental issues. The Nature Saskatchewan Board of Directors is responsible for acting on all resolutions that are passed by the members. This includes sending resolutions directly to the responsible government ministry and pursuing further action and/or meetings with government and others, as deemed appropriate.

Anyone wishing to submit a resolution for consideration at the 2019 Business Meeting, to be held on Saturday, September 15, is asked to send a written draft to the Nature Saskatchewan Office (info@naturesask.ca) no later than **Friday, August 9**. This provides an opportunity to receive feedback from members of the resolutions committee that can help to improve your resolution. It also helps us prepare for the meeting. Please note that resolutions not submitted to the Nature Saskatchewan office by 5 p.m. on Friday, September 6 will be considered only with the agreement of a two-thirds majority of those attending the business meeting.

Resolution Guidelines:

1. Resolutions must be in keeping with the society's mandate, bylaws and goals.
2. All resolutions must be submitted in writing.
3. A resolution is, essentially, an exercise in communication. Simple, clear language and focus on one topic or issue is most effective.
4. Supporting information presented in "Whereas" statements must be accurate and factual.
5. Resolutions should be no longer than one page, and preferably less.

WHOOPING CRANES AMID POLITICAL TURMOIL, SPRING 1885



Photo Credit: Nick Saunders

David Meyer
Professor Emeritus, Department of
Archaeology and Anthropology
University of Saskatchewan
Saskatoon, SK S7N 5B1
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Robert C. Clipperton
Saskatoon, SK S7N 0A7

In 1929, Campbell Innes of the Canadian Northwest Historical Society based in Battleford undertook one of his many information-gathering exercises. This involved a newspaper article with the request that “surviving members of the General Strange Expedition of 1885 ... should send their names and addresses” to the latter Society, with this explanation: “Every effort is being made to quickly collect and publish the source of history of the settlement days based on the stories of actual eye-witnesses of

those stirring days”.¹ One of those who responded to Innes' call was a farmer from Pense, Mr. A. McCarthy, although his experience was related to the military action of Colonel William D. Otter and not General Thomas. B. Strange.²

In the spring of 1885, amid the general tension throughout the Canadian prairies, two Plains Cree chiefs, Poundmaker and Little Pine, led a delegation from their reserves to Battleford “to declare their allegiance to the Queen and secure rations for their hungry bands”.³ This so alarmed the settlers of the region that they moved into the Northwest Mounted Police fort on the height of land overlooking the confluence of the Battle and North Saskatchewan Rivers. Colonel Otter, in command of some 500 soldiers, was dispatched to deal with the situation in the Battleford region. Otter's forces, transported by train as far west as Swift Current, marched and rode north from there on April 13, following the established trail to Battleford. Over the next few weeks, trains of wagons and carts followed the military force, carrying supplies and food to support the troops and the Battleford settlers. Mr. McCarthy was a teamster in one of these caravans:

Seeing the enclosed in the paper, I herewith state what I know about the transport arrangements. I had a homestead at Pense at the time & joined the expedition from there & Moosejaw [sic] with some neighbours. We unloaded our oxen at Swift Current 12 in the party. About 20 miles North of Swift Current about one mile east of the trail in a slew [slough] was a flock of large white birds like storks or

*ostridge [sic] about 500 - I never saw any of them since. When they rose to fly they shook the air like thunder though they were a mile away.*⁴

It is likely that the “storks or ostridge” that McCarthy observed were Whooping Cranes (*Grus Americana*). Certainly, as a resident of the Saskatchewan plains he would have known that they were neither snow geese nor swans. As well, these cranes would have been well within their traditional range and presumably had been resting and feeding in the course of their northward migration. While McCarthy's estimate of the size of the flock must be viewed with some uncertainty, it was clearly large. Evidently, the Whooping Crane population of the North American plains was still substantial at this time, its nadir some 50 years off.⁵

No doubt, as they made their way north, some of the birds observed by McCarthy would have dropped out of the flock when they reached their home nesting grounds in west central Saskatchewan. Others may have continued north to the wetlands of northwestern Saskatchewan and northern Alberta. Certainly, Whooping Cranes, in dwindling numbers, continued to nest across the Saskatchewan plains through to the 1920s.^{6,7,8,9}

McCarthy's observation, therefore, adds to the historical record of Whooping Cranes in Saskatchewan.^{7,8,9,10} Of course, two archaeological discoveries have added considerable time depth to these historical records: Whooping Crane bones from Ft. Rivière Tremblante (1791-98)^{11,12} and from the Fox Valley site, an ancient burial.

The latter has been dated to 2290±40 B.P. (Beta-177964).¹³

1. Innes C (1929). Correspondence of the Canadian Northwest Historical Society, Campbell Innes Papers, A113 Illb, Saskatchewan Archives Board. Saskatoon, SK.
2. Jamieson FC (1931). The Alberta Field Force of 1885. *Canadian Northwest Historical Society* 1(7). Battleford, SK.
3. Waiser B (2016). A World We Have Lost: Saskatchewan Before 1905. Fifth House Ltd. Markham, ON.
4. McCarthy A (1929). Letter to Campbell Innes, April 29. Correspondence of the Canadian Northwest Historical Society, Campbell Innes Papers, A113 Illb, Saskatchewan Archives Board. Saskatoon, SK.
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THE VERN HARMS IMPORTANT PLANT AREAS OF SASKATCHEWAN PROGRAM

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Important Plant Areas is a conservation program first developed by Plantlife International, a UK-based organization, to provide a platform for identifying and preserving significant wild plant populations. According to Plantlife, an Important Plant Areas program should “inform and underpin existing international, regional and national conservation programmes and legislation”. Ultimately, their hope is “that Important Plant Areas will act as a benchmark for determining whether the strongest protection, under any existing legislation, is being afforded to the most important sites for plants.”¹

Since the program's debut in Europe, other jurisdictions have followed suit. In North America, arguably the most well-developed programs are administered by the California Native Plant Society and our nearest neighbours to the south, the Montana Native Plant Society, for use in their respective states.

Using Montana's program as a template, the Botanical Assessment Working Group² (of which Nature Saskatchewan is a member), has adapted the program for Saskatchewan with the hope that

the provincial government will use it in its landscape planning approach. Now that the primary goal of reassessing rarity rankings for Saskatchewan's plant species is complete, the Botanical Assessment Working Group can shift its focus to a habitat level.

The hope is that an Important Plant Area designation will provide regulators and decision makers with information and an opportunity to direct development away from these significant sites. Other opportunities may include applying for funding for data collection, monitoring, or management of these sites, and working with land managers to continue to make decisions that are beneficial for the plant species and habitats that occur on these sites.

The Native Plant Society of Saskatchewan website will serve as a clearinghouse for the program. The website will have details about the program, how to nominate a site, and how sites will be adjudicated by the Botanical Assessment Working Group. Eight sites have already been designated in Saskatchewan and information on them will be available on the website soon.

Visit www.npss.sk.ca to learn more and to start your site nomination!

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IN MEMORIAM: WALTER KRIVDA (1932-2018)

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Walter Vladimir Krivda was born of Ukrainian parents in The Pas, Manitoba in 1932. During childhood and teenage years, Walter was fascinated with Nature and could often be found catching insects, pressing plants, picking mushrooms, and wandering through the fields and forests around his home. Describing himself as a timid young boy and speaking no English, he had a difficult time in school at first, but his language skills improved rapidly when he later transferred to a Catholic school, where classes were conducted in both French and English. After graduating from high school in 1952, Walter was hired at the Entomological Research Station in Ottawa, which greatly increased his knowledge of insects (Figure 1). He later pursued his education by attending United College (now the University of Winnipeg) and the University of Ottawa, where he graduated in 1954. His first job was teaching school (the only teacher for all nine grades) at Gillam, Manitoba, located at Mile 326 on the Hudson Bay Railway. The town consisted of only one street and wolves were frequent visitors, as evidenced by tracks in the snow and their nightly howling.

In the following years, Walter taught at Hecla and Virden, Manitoba, and in 1961, he became the first



FIGURE 1. Walter Krivda (middle row, kneeling, with long black hair) attending the 3rd Lepidopterists Society meeting held in Ottawa in July, 1952 (photographer unknown). Photo courtesy of Michelle Locke and Vazrick Zazari (Canadian National Collection of Insects, Arachnids and Nematodes, Agriculture and Agri-Food Canada, Ottawa).

Park Naturalist for Riding Mountain National Park, headquartered at Wasagaming, Manitoba. In 1965, he transferred to Prince Albert National Park with an office at Waskesiu, Saskatchewan. At both locations, he documented plant and animal life, preserved natural history specimens, prepared interpretive programs and displays, and gave lectures and nature tours for the public.

Walter's next position was with the Canadian Wildlife Service in Edmonton, where his work focused on identifying plants and lichens related to big-game feeding habits. He apparently missed teaching because he accepted the position of Supervisor of Extension Services at the Vocational Centre in The Pas, which evolved into the Keewatin Community College. Walter taught numerous courses over four decades, with one of his favourites being the Adult Basic

Education Course, which prepared students, who had been away from school for some time, to attend full-time college. Even in retirement, he continued tutoring students and encouraging in them an interest in biology. In 1970, Walter was awarded a Manitoba Centennial Medal by the Manitoba Historical Society for his "contributions to Manitoba in the teaching profession and for his many years of research in natural history and work for museums." Walter was particularly active with the Sam Waller Museum in The Pas. He was well known to the staff and readers of the *Opasquia Times* newspaper in The Pas through his articles, such as his 2008 recommendation to band trees to protect them against cankerworms; of course, he took this as an opportunity to describe the entire life cycle of the moth.

Wrigley first met Walter back

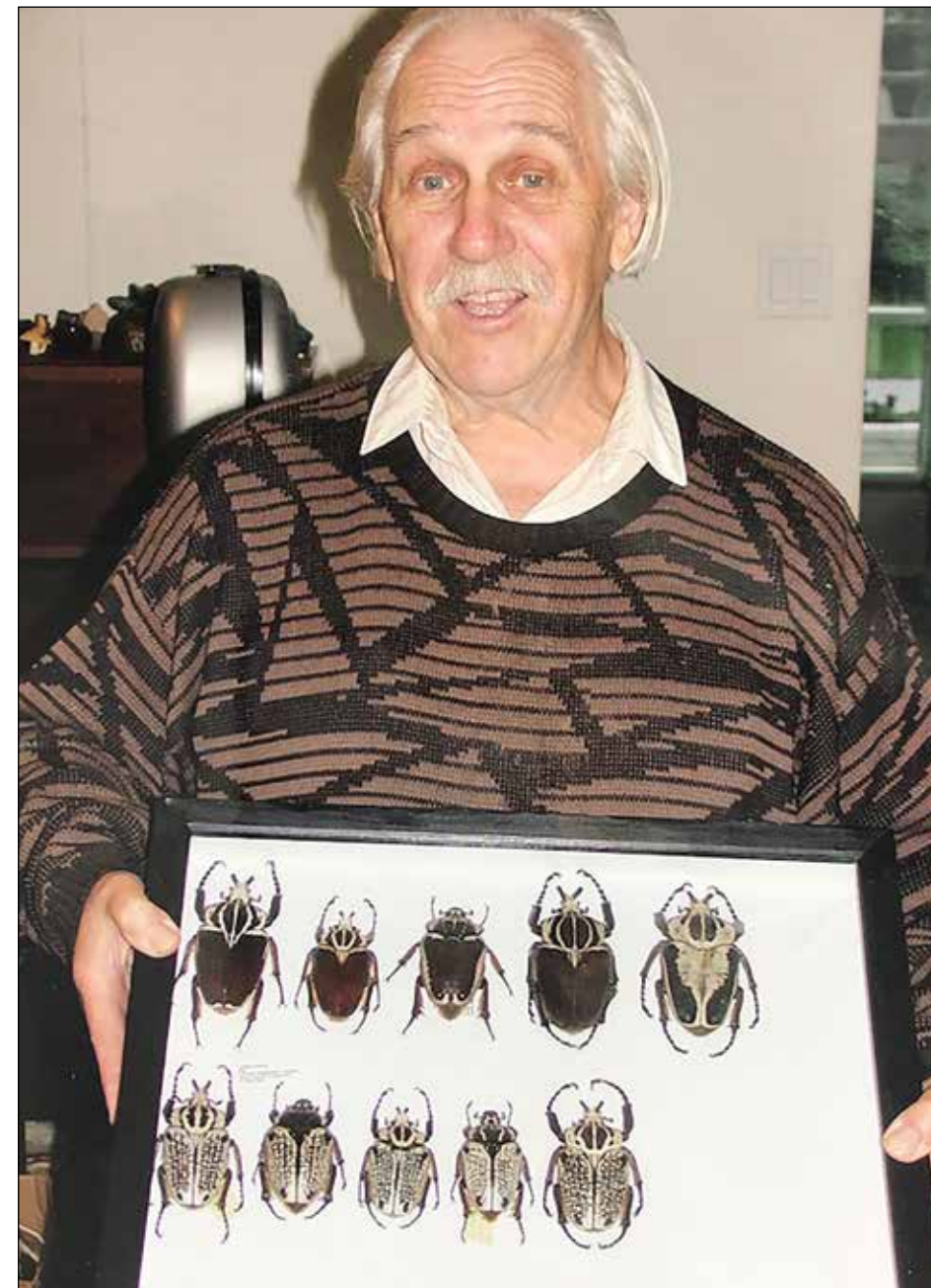


FIGURE 2. Walter posing with a tray of goliath beetles during a visit to Robert Wrigley's Winnipeg home in 2014. Photo credit: Robert Wrigley.

in the early 1970s during Walter's occasional visits to the Manitoba Museum, where he spent the day happily perusing the research collections of plants and insects, and determining the identifications of his specimens. In later years, he sent in bottles of beetles from The Pas area (with Walter's penchant for thrift, preserved in mouth wash), which Wrigley mounted and deposited into the J.B. Wallis-R.E. Roughley Museum of Entomology. Walter frequently requested entomology books and

spare beetle specimens so that he could teach local youth how to prepare and identify specimens, in the hopes they would take an interest in entomology (Figure 2). While interested in diverse natural history subjects, two of his favourite projects were raising wasps from galls and tending varieties of garden plants. He encouraged Wrigley to plant his huge fava beans, a variety he emphasized were brought by his parents from the Old Country; he said they were excellent in soups (and they were).

One of Walter's routines during the warmer months was to check out the street lights each evening for unusual moths. He corresponded frequently with scientists in Ottawa regarding the identifications of insects and plants, and recorded a number of distributional records of species from The Pas. Walter was eager to share his exciting discoveries, and consequently, he frequently published his research, ranging from slugs and fungi to butterflies and shrews, in the *Blue Jay* — the journal of Nature Saskatchewan. Over the decades, Walter accumulated vast collections of plants, moths, butterflies, beetles, and small mammals.

Unable to type letters or labels, Walter's handwriting style was notoriously challenging to decipher, so his occasional letters required some time and effort to interpret. However, he could readily talk on the phone for an hour or more, jumping from one topic to another, such as classical music, ancient history and his family recipes. He was the ultimate storyteller, with a breadth of knowledge (largely self-taught) that was truly impressive. Known to children of The Pas area as 'Santa,' and to adults as 'Uncle Walter,' he was recognized as a pillar and legend in the community. Kind, gentle, and generous of nature, he was quick to offer greetings to people on the street, and often handed fresh fruit and preserves from his garden to anyone walking by his home. Walter passed away on September 17, 2018 at the age of 86 years. He will be missed by his many friends in The Pas, and by his natural history colleagues down south.

Michael Leblanc grew up in The Pas where Walter was a long-time friend of the family. Every Thursday night, Walter came by the house and — over tea, crackers, and preserves — he would discuss insects, life, and solve the world's problems. Walter was always willing to share information freely, and especially loved discussing

entomology. He was also very well versed in what was edible in the bush, and conducted many field trips with students and anyone else who wished to learn. He taught what mushrooms, berries, and other plants were good to eat, and then picked certain leaves for making tea.

Walter loved to teach and expand people's minds, loved his entomology and his insect collection, and his large collection of books of which he had no doubt read each one. Even in the hospital, a few weeks before his death, he was still trying to teach, regaling visitors during their hospital visits, including Michael's son Riley, with stories about the history of The Pas. Walter was full of knowledge and willing to share it with anyone willing to listen. His loss is more than just a loss of a good man, but the loss of a lifetime of knowledge. Even though Riley only met Walter shortly before his death, he knew Walter through the stories his family would tell him. Riley's love for entomology was enhanced by the knowledge Michael gained from Walter. Walter will be missed.

We wish to thank to Michelle Locke and Vazrick Nazari (CNC) for submitting a photograph of Walter, and Sharain Jones (Museum Director, Sam Waller Museum, The Pas) for directing the authors to the following publication: Krivda, W. 1983. *In*; The Pas Gateway to Northern Manitoba. The Pas Historical Society, The Pas, Manitoba. pp. 312-314.

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- | | |
|---|---|
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| 1982. Fungi preserving. <i>Blue Jay</i> 40(2):72. | 2006. Large earthworm at The Pas, Manitoba. <i>Blue Jay</i> 64:112. |
| 1982. White-faced queen wasp attacks crane fly at The Pas. <i>Blue Jay</i> 40(3):153. | 2006. Net butterfly records. <i>Blue Jay</i> 64:113. |
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| 1984. Manitoba records for showy aster. <i>Blue Jay</i> 42(2):70. | 2008. Pink lady's slipper population at Reed Lake, Manitoba. <i>Blue Jay</i> 66:52. |
| 1985. Chinese elm – a new food plant for the mourning cloak butterfly. <i>Blue Jay</i> 43(2):130. | 2008. Showy lady's slipper, <i>Cypripedium reginae</i> , in disturbed habitat at The Pas, Manitoba. <i>Blue Jay</i> 67:178. |
| 1985. Sudden disappearance of morels at The Pas, Manitoba. <i>Blue Jay</i> 43(3):150. | 2011. Slugs as a control measure for burdock at The Pas Manitoba? <i>Blue Jay</i> 69(3):130. |
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| 1986. Variegated fritillary breeding at The Pas, Manitoba. <i>Blue Jay</i> 44(3):166-167. | |

46TH SASKATCHEWAN CHRISTMAS MAMMAL COUNT - 2018

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Eighty-three Christmas Mammal Counts were conducted this past winter — the same number as last year. Even as the Christmas Bird Count was one of the dullest of the century, the Christmas Mammal Count was one of the most interesting.

The 3,434 mammals seen or heard was only 14 fewer than the 3,448 recorded last winter. For the first time ever, more Mule Deer were recorded than White-tailed Deer (1,016 versus 948). Both species declined in numbers over 2017-18, but the difference was that the number of White-tails dropped drastically from 1,401 animals; the Mule Deer only slightly from 1,105 individuals.

Eastern Fox Squirrels continue to increase their numbers with a record high count of 130 at Regina, and a record provincial high of 243. They continue to work their way north along the South Saskatchewan River with three showing up on the Gardiner Dam count; it won't be long before they hit Outlook, then on to Saskatoon. It will be interesting to see how far north they will go. The 47 Eastern Grey Squirrels at Swift Current was a record high count for that species.

Other noteworthy records were a Fisher at Indian Head, a Gray Wolf at Kenaston and three at Saltcoats, and Cougars at Indian Head and Weyburn. Last year, I warned of the impending appearance of Wild Boar, and this year ominous evidence of its occurrence — admittedly only the basis of tracks — came from the Pike Lake Count.

With 16 species seen or heard, Indian Head led the way for the most species seen or heard on a count. For the 11th year, no new species were

added this winter so the all-time provincial total remains at 51 species seen or heard (plus three species found dead and three others recorded only on the basis of tracks).

For information on participants, weather, coverage and location of Christmas Mammal Counts, see the Christmas Mammal Count summary in this issue.

Explanation of entries in Table 1.

The number of mammals actually seen or heard on count day is treated separately from those recorded by other means, or those recorded during count period (December 14 to January 5) but not on count day. Numbers of individuals seen or heard are given in Table 1 and are tallied in the first line of totals at the bottom of the table. The number of species they represent is given in the second line.

For species only detected by tracks or by other means, or that are seen or heard only in the count period but not on count day, no numbers of individuals is given in Table 1. Species detected only by tracks are indicated by 't' in the table; those detected only by other means: dead animals 'm', more clearly identifiable chewing or digging 'd', dens or lodges 'L' (including Muskrat push-ups) and by smell 's.' Species detected by any means during the count period, but not on count day are indicated by 'c' in the table. These additional species are tallied in lines 3, 4 and 5 at the bottom of the table. If a mammal is reported as member of a species group (i.e. mouse species, deer species), it is counted as a species only if no other species in this group has been definitely recorded. The columns at the end of the table give totals for each species. 🐿



Mule Deer. Photo Credit: Nick Saunders

TABLE 1. 46th Saskatchewan Christmas Mammal Count - 2018.

SPECIES	ARCHERWILL 27 DEC 2018	AVONLEA 2 JAN 2019	BALGONIE 5 JAN 2019	BIGGAR 20 DEC 2018	BIRCH HILLS 4 JAN 2019	BORDEN - RADISSON 21 DEC 2018	BROADVIEW 28 DEC 2018	CANDLE LAKE 5 JAN 2019	CATER 3 JAN 2019	CHATSWORTH 4 JAN 2019	CHURCHBRIDGE B 5 JAN 2019	CLARK'S CROSSING 15 DEC 2018	CRAVEN 15 DEC 2018	CROOKED LAKE 2 JAN 2019	CROOKED RIVER 27 DEC 2018	CYPRESS HILLS PP. 28 DEC 2018	DENHOLM 25 DEC 2018	DORINTOSH 22 DEC 2018	DUNDURN 22 DEC 2018	DUVAL 23 DEC 2018	E. B. CAMPBELL DAM 3 JAN 2019	EASTEND 3 JAN 2019	EBENEZER B 5 JAN 2019	
Shrew species									t			1												
Eastern Cottontail																								
Nuttall's Cottontail																1				t			5	
Snowshoe Hare	c			t	t	1	t				1						1	t	t	t	t			
White-tailed Jack Rabbit			1	t			t					t	t									1	2	
Richardson's Ground Squirrel																							2	
Black-Tailed Prairie Dog																								
Eastern Grey Squirrel										1														
Eastern Fox Squirrel		1	23				4						21								4			
American Red Squirrel	6		1	1	d	6	2	20	7	4	3	2	10	5		7	1	2		t	11			
Northern Flying-Squirrel											c						1							
Northern Pocket Gopher																								
American Beaver							L			L				L					L					
Deer Mouse			t				t															t		
Muskrat				L																L				
Gapper's Red-Backed Vole																2	L							
Meadow Vole							t																	
Vole species				t								2						c			t			
Norway Rat																								
Mouse species	t											t		2				t		t				
American Porcupine	c		t				1											c	1					
Coyote	c		7	3	1		3	m		3	t	2	4		t	2	3	t	t	t	t	2	2	
Gray Wolf								t										t						
Red Fox			1				t		c							3	t	t		t				
Raccoon																								
American Marten																								
Fisher																		c						
Ermine																								
Long-tailed Weasel							t																	
Least Weasel							t						1			t								
Weasel species	c			t	t						t										t	t		
American Mink	c						t														t			
American Badger				d	d												d							
Striped Skunk	c																							
River Otter																		t		t				
Mountain Lion																								
Canada Lynx							1																	
Wild Boar																								
Mule Deer			9	28		1	21					11	41			3	1	c	15	30		92		
White-tailed Deer	2	3	19	1	t		8	16			5	12	21	2	t	15	9	15	5	9	4	62	4	
Deer species									t															
Moose	1						t			t	1								t			1	2	
Elk																					t			
Pronghorn																								
American Bison																								
TOTALS SEEN/HEARD ON COUNT DAY	9	4	61	33	1	8	39	37	7	8	10	28	100	7	2	28	21	17	21	43	15	163	12	
TOTAL SPECIES SEEN/HEARD	3	2	7	4	1	3	6	3	1	3	4	5	7	2	1	5	8	2	3	3	2	6	5	
TOTAL SPECIES RECORDED BY TRACKS	1	0	2	4	3	0	9	1	2	1	2	1	2	0	2	0	7	3	6	7	2	0	0	
TOTAL SPECIES OTHERWISE RECORDED	0	0	0	2	2	0	1	1	0	1	0	0	0	1	0	0	1	2	0	2	0	0	0	
SPECIES RECORDED COUNT PERIOD	6	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	4	0	0	0	0	0	
TOTAL SPECIES COUNT PERIOD AND DAY	10	2	9	10	6	3	16	5	4	6	6	6	8	3	3	7	9	14	6	11	9	8	5	

SPECIES	ENDEAVOUR 23 DEC 2018	ESTEVAN 30 DEC 2018	ESTUARY NORTH 27 DEC 2018	FENTON 4 JAN 2019	FLORAL 14 DEC 2018	FORT OU'APPELLE 14 DEC 2018	GARDINER DAM 7 DEC 2018	GOOD SPIRIT LAKE 4 JAN 2019	GRASSLANDS NP. 12 DEC 2018	GRAYSON 27 DEC 2018	GRENFELL 5 JAN 2019	HARRIS 19 DEC 2018	HUDSON BAY 29C 2018	MIDIAN HEAD 27 DEC 2018	KENASTON 15 DEC 2018	KENOSEE LAKE 27 DEC 2018	KETCHEN 26 DEC 2018	KINLOCH 27 DEC 2019	KUTAWAGAN LAKE 4 JAN 2019	KYLE 29 DEC 2018	LAC LA PLOUGE 28 DEC 2018	LA RONGE 22 DEC 2018	LMLINWA 5 JAN 2019	
Shrew species																								t
Eastern Cottontail		9																						
Nuttall's Cottontail			3				4		2							t				3				
Snowshoe Hare	1				t	c		t			t		t	1	t			t			t	1		
White-tailed Jack Rabbit		t	1		t		t	t	1		t	t		1	t			t	t	t			t	
Richardson's Ground Squirrel									1															
Black-Tailed Prairie Dog									55															
Eastern Grey Squirrel																								
Eastern Fox Squirrel	1	2				2	3				2	2	6										2	
American Red Squirrel				1		13		2	5		1	1	14			1		11				4		
Northern Flying-Squirrel																								
Northern Pocket Gopher								d																
American Beaver								L								L	L	L						
Deer Mouse											t			1								t	t	
Muskrat												L						L			L			
Gapper's Red-Backed Vole																								
Meadow Vole																								
Vole species																							t	
Norway Rat																								
Mouse species																							t	
American Porcupine	1																						t	
Coyote	1	1	1	t	3	1	9	t	17		1	5	t	5	4	1	2	t	t	6	1		4	
Gray Wolf																1								
Red Fox																							t	
Raccoon										1							2						t	
American Marten																								
Fisher														1					t					
Ermine															1								t	
Long-tailed Weasel																								
Least Weasel	1																						t	
Weasel species																								
American Mink	1																							
American Badger																								
Striped Skunk																								
River Otter																							2	
Mountain Lion																								
Canada Lynx																								
Wild Boar																								
Mule Deer		12	37																				17	
White-tailed Deer	4	109	t	4	15	43	18	57			4	28	12	18	2	8	1	22	4	50				
Deer species																								
Moose	8		11					t							15						1			
Elk																						1		
Pronghorn			6																					
American Bison																								
TOTALS SEEN/HEARD ON COUNT DAY	18	24	168	1	8	32	97	20	329	0	8	77	15	105	12	10	5	36	60	268	2	7	23	
TOTAL SPECIES SEEN/HEARD	8	4	7	1	3	5	5	2	11	0	4	4	3	16	6	3	3	4	2	6	2	3	3	
TOTAL SPECIES RECORDED BY																								

SPECIES	LERROY 5 JAN 2019	LOVE-TORCH RIVER 26 DEC 2018	LUSELAND 22 DEC 2019	MARTINEAU RIVER 21 DEC 2018	MEADOW LAKE 26 DEC 2018	MELFORT 22 DEC 2018	MOOSE JAW 22 DEC 2018	MOOSE MOUNTAIN PP. 29 DEC 2018	MORSE 16 DEC 2018	NICOLLIE FLATS 19 DEC 2018	NIPAWIN 26 DEC 2018	NISBET FOREST NW 26 DEC 2018	NISBET FOREST WEST 29 DEC 2018	ODESSA 29 DEC 2018	OUTLOOK 26 DEC 2018	PIKE LAKE 5 JAN 2019	PRINCE ALBERT 16 DEC 2018	QU'APPELLE 28 DEC 2018	QU'APPELLE DAM 16 DEC 2018	RAYMORE 25 DEC 2019	REGINA 29 DEC 2018	ROSCOMMON S.D. 2 JAN 2019	ROULEAU 17 DEC 2018	
Shrew species														c										
Eastern Cottontail																								
Nuttall's Cottontail																								
Snowshoe Hare							t							5							1			
White-tailed Jack Rabbit	t	t									t	t	1		5	t					t	2		
Richardson's Ground Squirrel			1				t			6	t	t			12	t				2		t		
Black-Tailed Prairie Dog																								
Eastern Grey Squirrel															2									
Eastern Fox Squirrel	1				16	3				6				12	5	45	2			2				
American Red Squirrel		9				8		4	6		12	19					12	c	4	1		5	5	
Northern Flying-Squirrel																								
Northern Pocket Gopher																								
American Beaver														c										
Deer Mouse												L	L		d			L		L	L			
Muskrat							t								t							t		
Gapper's Red-Backed Vole													L					L		L	L			
Meadow Vole														c										
Vole species																								
Norway Rat											t					t	t							
Mouse species	2									4											t			
American Porcupine	t	t									t													
Coyote	1	t	1				1			2			3		t	t				d		1		
Gray Wolf	t	1	13	1	3		t			4	7	2	1	2	5	3	2		1		2	t	5	
Red Fox																		c						
Raccoon	t	1	1				t		1	2	t	t	1		1	1		1	1		1	1		
American Marten										4			t				t							
Fisher																								
Ermine												t	c		t							t		
Long-tailed Weasel	t						t			1			c		t									
Least Weasel			c				c																	
Weasel species		t									t													
American Mink					1								c		t						d			
American Badger							d			2					d						d			
Striped Skunk		t											s		t									
River Otter																			1					
Mountain Lion																								
Canada Lynx		3	89		7		58			28	6	15	2	1	90	6	4				29			
Wild Boar	4	33	12	2	9	3	191	17	c	20	36	31	8	4	9	8	12		t	3	9	1	47	
Mule Deer																								
White-tailed Deer		1	4							2			t	c	4		6			1	2	t		
Deer species		t														6						t		
Moose																					33			
Elk																								
Pronghorn																								
American Bison																								
TOTALS SEEN/HEARD ON COUNT DAY	6	53	8	10	6	1	30	5	120	97	23	2	5	59	5	46	23	26	156	26	174	25	21	
TOTAL SPECIES SEEN/HEARD	2	7	4	2	2	1	3	2	6	6	3	2	2	12	2	6	2	6	6	7	7	5	3	
TOTAL SPECIES RECORDED BY TRACKS	6	9	0	2	0	0	0	0	1	3	0	3	2	0	1	2	6	4	0	0	3	11	0	
TOTAL SPECIES OTHERWISE RECORDED	1	1	0	0	0	0	0	0	3	1	0	1	0	0	0	0	3	1	0	1	1	1	1	
SPECIES RECORDED COUNT PERIOD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	2	0	2	0	
TOTAL SPECIES COUNT PERIOD AND DAY	9	17	4	4	2	1	3	2	10	10	3	6	4	12	3	8	11	15	6	10	11	19	4	

SPECIES	ROUND LAKE (P.A.) 5 JAN 2019	ROUND LAKE (Q.V.) 17 DEC 2018	SALCOATS 18 DEC 2018	SASKLANDING PP. 20 DEC 2018	SASK. RIVER FORKS 15 DEC 2018	SASKATOON 26 DEC 2018	SAWYER LAKE 24 DEC 2018	SHAMROCK 19 DEC 2018	SHELL LAKE 18 DEC 2018	SWIFT CURRENT 15 DEC 2018	THICKWOOD HILLS SPRITWOOD 21 DEC 2018	TURTLE LAKE 27 DEC 2018	TURTLEFORD 28 DEC 2018	WEYBURN 15 DEC 2018	WHITE BEAR 2 JAN 2019	WHITEWOOD 24 DEC 2018	WINGARD 2 JAN 2019	# INDIVIDUALS SEEN/HEARD COUNT DAY	# COUNTS SEEN/HEARD	# COUNTS RECORDED AS TRACKS	# COUNTS RECORDED AS OTHER	# COUNTS COUNT PERIOD	# COUNTS COUNT PERIOD & COUNT DAY
Shrew species																		c		t			
Eastern Cottontail																					t		
Nuttall's Cottontail				t				1		2													
Snowshoe Hare					t	2	t		t				1										
White-tailed Jack Rabbit						3		m		1				23		2							
Richardson's Ground Squirrel																							
Black-Tailed Prairie Dog																							
Eastern Grey Squirrel										47													
Eastern Fox Squirrel																2							
American Red Squirrel		1				2	12	t		28		4	5	4	21	10	1	289	43	4	1	1	49
Northern Flying-Squirrel																							
Northern Pocket Gopher														c							1	1	2
American Beaver																L			L	L	c		L
Deer Mouse																					c		
Muskrat																					L		L
Gapper's Red-Backed Vole																							
Meadow Vole																							t
Vole species																							
Norway Rat																							
Mouse species																							
American Porcupine																							
Coyote																							
Gray Wolf																							
Red Fox																							
Raccoon																							
American Marten																							
Fisher																							
Ermine																							
Long-tailed Weasel																							
Least Weasel																							
Weasel species																							
American Mink																							
American Badger																							
Striped Skunk																							
River Otter																							
Mountain Lion																							
Canada Lynx																							
Wild Boar																							
Mule Deer																							
White-tailed Deer																							
Deer species																							
Moose																							
Elk																							
Pronghorn																							
American Bison																							
TOTALS SEEN/HEARD ON COUNT DAY	0	3	7	19	9	46	1	58	35	88	17	5	36	83	55	45	1	3434					
TOTAL SPECIES SEEN/HEARD	0	2	2	5	2	6	1	4	4	7	3	1	9	8	3	8	1	36					
TOTAL SPECIES RECORDED BY TRACKS	0	0	1	2	9	0	9	0	1	0	0	0	0	0	4	5	0			28			

CELEBRATING NATURE SASKATCHEWAN'S VOLUNTEER STEWARDS DARLENE ROTH SANCTUARY STEWARD OF THE TURTLE LAKE NATURE SANCTUARY

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Nature Saskatchewan will be forever grateful for Darlene Roth's efforts as the Turtle Lake Nature Sanctuary Steward. Darlene has been the Sanctuary Steward for about four years, but has been an active volunteer at the Sanctuary for a lot longer. Nature Saskatchewan would like to thank Darlene for all her hard work and we look forward to her continuing as the Sanctuary Steward for many more years.

The 48.5 hectare Turtle Lake Nature Sanctuary is located about 35 km northwest of Glaslyn, SK along the east shore of Turtle Lake.¹ It

features cliffs with a lookout above the lake, upland mixed forest dominated by Trembling Aspen (*Populus tremuloides*) and White Spruce (*Picea glauca*), an open meadow, a boreal wetland, a small pond and a gravel pit that is slowly revegetating.¹

Darlene has a long list of potential projects to improve habitat and visitor experiences, and to promote awareness of the Sanctuary. She wants to restore the open meadow habitat that is being encroached by trees and improve amphibian habitat at the frog pond. Darlene is considering how to best provide Sanctuary tours to children. She also plans to develop a promotional video of the Sanctuary using a drone. Darlene has completed a lot of



People visiting the Sanctuary and walking along a mowed trail.

projects for the Sanctuary already, including setting up geocache stations and interpretative signage, and writing articles in the *Blue Jay* to promote the Sanctuary. And these projects are in addition to the regular maintenance work required on the Sanctuary's trails, signs, fences and benches.

Darlene is most proud of the signage intermittently throughout the Sanctuary that showcases local plants and wildlife, and the interpretative signage that describes points of interest, such as the Big Tree. She is also excited to get children from the Grade 5 class at Glaslyn School involved in updating that signage with their artwork. The students will have a tour of the Sanctuary in spring 2019 and get to see where their artwork will be displayed. Darlene plans to set up a scavenger hunt for them.

Darlene seems to find willing volunteers or donors whenever she talks about the Sanctuary and it's easy to see why with the enthusiastic way that she talks about the place. Whether the job is mending fence rails that a tree fell on, clearing overgrown trails with a chainsaw, plowing snow, maintaining cross-country ski trails, building bird houses, fundraising, or making



A sign points out the Big Tree to visitors.

monetary donations, Darlene is quick to recognize all the people that help her in her role as Sanctuary Steward. She lists names and what work these people like to do at the Sanctuary. Doug Cushway is eager to clear overgrown trails and create additional new trails if desired. Doug also creates cross-country ski-tails in winter. Brenda Rutz from Meadow Lake, SK is an amateur photographer who has donated photos of the Sanctuary to be raffled off as a fundraiser for the Sanctuary. They will likely raffle off more of her work in the near future. Marvin Brose mends rails on the fence. The person that delivered the Secan asked what else he could do or how he could help. He may want to donate or volunteer at the Sanctuary. Lorrie Bannerman has helped Darlene by mowing trails with Darlene's push lawn mower. The large sign at the main gate sign was sponsored by the Cliff Wieger family. Vince Wiesner is a good friend of Darlene's, who built and donated six bluebird houses. Ms. Raecine Franke is a Glaslyn school teacher that is working with her students to update the Sanctuary signs with student artwork. These are just a few of the people that donate money or their time to the Sanctuary.



The current and former Turtle Lake Nature Sanctuary Steward, Darlene Roth and Muriel Carlson (right).

the Sanctuary Steward at that time, Muriel Carlson.

It is easy to tell from talking to Darlene that she is very passionate about the Turtle Lake Nature Sanctuary. An hour and several pages of notes later, Darlene and I end our conversation regarding the Sanctuary. I am left with a visual of four years ago, when Muriel Carlson handed an appreciative Darlene Roth the key to the Sanctuary and with it passed on to her the title of Turtle Lake Nature Sanctuary Steward. Nature Saskatchewan is excited to see what Sanctuary projects Darlene and her many helpers work on in the future. Thank you, Darlene! You truly are a voice for nature.

1. Peschken, D.P. 2003. Wilderness Preserved: Nature Saskatchewan's Sanctuaries. *Blue Jay* 61: 68-81. 🐦



Benches for hikers to rest along the North Shore Trail. All photos courtesy of Darlene Roth.



The large main gate sign sponsored by the Cliff Wieger Family



American Crow taking a drink while a Fox Squirrel eats a peanut. All Photos courtesy of Kimberly Epp.



Black-capped Chickadee taking a drink at bird bath.



American Crow at the water dish.



A Fox Squirrel trying to keep cool during the 42.3 degree day in August 2018.

BEYOND YOUR BACKYARD: WATER FOR WILDLIFE

Kimberly J. Epp

It is important to have cool water available during heatwaves for your urban wildlife friends. No matter where you live, you can help out in a small way — from placing a simple ceramic dog bowl on the ground (for stray pets, squirrels or rabbits) to putting out a bird bath, or even putting a small pond in the backyard. You'd be surprised by the activity that the water will attract.

I put out a ceramic dish and a bird bath, and refill it twice daily. Placing stones in them ensures the water is not too deep for the birds, yet still allows them to bathe. Active bathing attracts other species, so the birds will not use the bath if they feel unsafe in it. Birds also need a safe passage to a bush or tree. Always place the bath close enough to the safety of the trees, but not too close that a predator could sneak up on them. I often sat outside last summer and watched the bath, and in the period of an hour one day, watched a robin, house finch, chickadee, flicker, and red-breasted nuthatch all stop for a drink.

Whatever you choose for your bird bath, ensure it is not slippery or too

deep. A shallow bath is preferred for bathing. Concrete or ceramic are great, although more expensive. In the winter, you can buy a bird bath with a heater (or use a heated dog dish). You can also buy solar-powered fountain baths.

Baths for insects can also be put out, which can be made easily by placing small stones in a tray. Add water, and watch the insects drink! Lastly, ensure the bath is in an area where you can enjoy watching your visitors, 'bee' them feathery, furry or fluttery!

Wildlife have ways of adapting to hot weather. Squirrels spread their bodies as flat as can be, in the shadiest spot possible, and pant. Many birds pant to cool down as well. Hares can regulate their temperatures through their ears, and desert-dwelling hares have the largest of ears, living in the hottest of climates. The blood vessels in their ears dilate, encouraging their surface-area-to-volume ratio, which encourages heat loss. The desert dwelling hares can conserve water because they don't lose water through sweating or panting. If, on the other hand, a hare is too cold, these blood vessels constrict to conserve body heat.

Elephants have sweat glands

between their toes, much like dogs, and lose some heat that way. They also flap their ears to stay cool, wade in water and roll in the mud. The mud provides an insulating layer to help keep them cool and keep insects at bay. Pigs (wild and domestic) do the same thing, and animals such as mink and otter love to keep cool in the water and mud. In the mud, water evaporates much more slowly than water alone, which allows the animal to feel cooler for a longer period of time.

Birds can keep cool through gular fluttering, much as a dog keeps cool through panting. Gular fluttering is done by vibrating muscles and bones in the throat. This helps regulate temperatures by increasing evaporation through the membranes in the throat. The more a bird vibrates them, the more the moist throat membranes are exposed to air, allowing for better evaporation. As this process involves only a small number of muscle and bone, it doesn't require a lot of energy. This makes it an efficient way of cooling own. Types of birds that employ this method include pelicans, doves, owls, quails and nighthawks.

Some animals escape the elements in winter through hibernation, but there are animals that also escape the heat through a process called estivation. This is a form of sleeping through scorching temperatures. Estivation helps the animal survive by slowing down its metabolism, which means it doesn't have to eat or drink

as much. This is helpful when prey and vegetation is scarce. Snails, for example, estivate to prevent their bodies from drying out.

Reptiles regulate their temperatures through the temperature of the air, so if it is too hot, they will seek shadier areas. If they want to boost their metabolism, they seek the sun. Because they don't regulate their temperatures internally, reptiles require far less food. However, their dependence on temperatures leaves them much more susceptible to environmental changes.

Although heatwaves are normal, with climate change they are getting longer and more intense each year. When the heatwaves are prolonged is when things get more difficult. There is undeniable evidence that animals, birds and plants are being affected by our warming world, both by their distribution and behaviour. Many species are moving towards the poles in response to the rise in global temperatures. Changes in evolution occur gradually, which is why so many animals are struggling to adapt to rapid global warming.

Several heat records were broken last August, with one day in Moose

Jaw reaching 42.3 degrees Celsius. The winter of 2017/18 was the driest in 130 years. Already this year the snow is gone, and there is very little standing water. I remember when the ditches used to be full of water, and we rafted in the ditches. Another dry, hot year may be another difficult year for wildlife.

Cats and dogs can kill vulnerable wildlife trying to cool down, so please keep them inside – for their own safety as well. Also, heatwaves are often difficult for the young wildlife, as they haven't yet learned how to cool down. If you find a baby squirrel or baby birds on the ground under a tree during a heatwave, call the Wildlife Rehabilitation Centre at (306) 242-7177.

Along with heat waves, we can expect more wildfires in the dawn of the "new normal." Last year's fires in California, following six years of drought, were the worst in recorded history. Three years ago, we had more than 600 uncontrolled fires burning in northern Saskatchewan. There were more than 550 fires in British Columbia last summer, the second worst in the province's history.

So what about the wildlife affected by these fires? How can you help them if you are in an area they may be fleeing to? How does the wildlife manage to survive? What do you

do if you come across an injured animal? If you are on the fringes of a fire, animals may flee through your yard. They need to refuel and recover. Placing large basins of cool water for large mammals along with smaller dishes for smaller animals will help. Even providing a mud pit for animals to soothe themselves in may be lifesaving. Provide as many basins as possible. When you empty them, build your mud wallow and refill again with cool water from the hose. Place these all as far away from the house as possible.

Any reptile, amphibian or animal that is having obvious trouble should be given a helping hand. I used to always carry a wildlife rescue kit in my car, as you never know when you might need it. Always consult an official when you can, but remember Jane Goodall's famous quote: "We all make a difference. We just have to decide what that difference will be."

Kimberly Epp is an environmental educator/writer, with more than 25 years of experience in environmental research, writing, enforcement and education, including various volunteer environmental board positions within Moose Jaw and the Moose Jaw area. She is currently President of Nature Moose Jaw, and can be contacted at kepp@shaw.ca. 🐦



Crystal Lake. Photo Credit: Andrea Olive

HUMAN NATURE

Andrea Olive
Associate Professor
Departments of Political Science and
Geography & Programs in Environment
University of Toronto Mississauga
& Writer-in-Residence, Wallace Stegner
Home, Eastend SK (April 2019)

A single loon calls out. Another one answers. An eastern wind has water lapping up on the shore — quiet and repeating. My eyes are still closed, and I know it is early. I can feel the blue cloudless sky. Another day in Saskatchewan's Aspen Parkland is upon me.

My mom and dad drove out from the city to see a piece of land at this itty-bitty lake in 1983. It is a beautiful area of eastern Saskatchewan where the prairies roll into the boreal forest. Close to the Manitoba border and the Porcupine Provincial Forest, the lake is nestled into a landscape of canola and wheat fields, wetlands, and trees. Upon seeing the lake, my parents immediately purchased a big plot — with 100-feet of lake frontage — bordering the little wildlife preserve on the south-eastern side of the lake. The bird sanctuary

would sit next to our sanctuary.

From then on, my childhood summers played out with the exact same refrain. My brother and I felt nothing but the freedom of bare feet. We caught tadpoles and frogs. We did cannonballs off the dock. No TV meant card tricks and not-bored-games at night. We roasted marshmallows over an open pit fire. We fended off mosquitoes, built rafts and forts, and learned to swim. On Sundays in Church we prayed for rain for the farmers with fingers crossed behind our backs. In early September, we returned to school sun-streaked with dirt still under our fingernails.

Crystal Lake was not our official home. We never got mail there. We didn't even get an address with a "street name" until I was old enough drive. We had a phone number starting in the late 1980s but it was always disconnected come August 30. Mom's china wasn't there. Dad's suits never hung in the closet. My room did not have pictures on the wall or any of my books or stuffed animals. It was just a "cabin" and not a "home."

But there is no denying that the lake is where my love of nature was

born. My first wasp-sting, my first bear sighting, my first caught fish, my first sunburn — all happened there. I spent 15 consecutive summers at the lake. After I left for college, it became harder to return with any frequency. While I completed my PhD in the U.S., I only made it back once — for my 30th birthday.

But in the summer of 2016, my American husband and I purchased a plot of land on that itty-bitty lake. It is on the south-west side kitty-corner to my parent's land. We have built our "non-home" home there. And like migratory birds, we leave Toronto in late April and summer in the Aspen Parkland. Come fall, we return to Ontario. Thus, for a few blissful months, our lives are narrated by loons and the gentle sound of water lapping against the shore.

Wallace Stegner, the iconic writer of the American West, said "I may not know who I am, but I know where I am from." He was talking about Saskatchewan. I couldn't have said it better myself. Ours is a "geography of hope" where a connection with nature is not just a possibility but an inevitability. 🐦



Photo credit: Fran Kerbs

Mystery Photo Summer 2019 (above left)

THE QUESTION IS: What species of insect is this? Hint: the answer is in the wings.

Please send your answers to Blue Jay editor Annie McLeod at bluejay@naturesask.ca or by letter mail: 3017 Hill Ave. Regina, SK S4S 0W2.

Those with correct answers will be entered into a draw for a prize from Nature Saskatchewan.

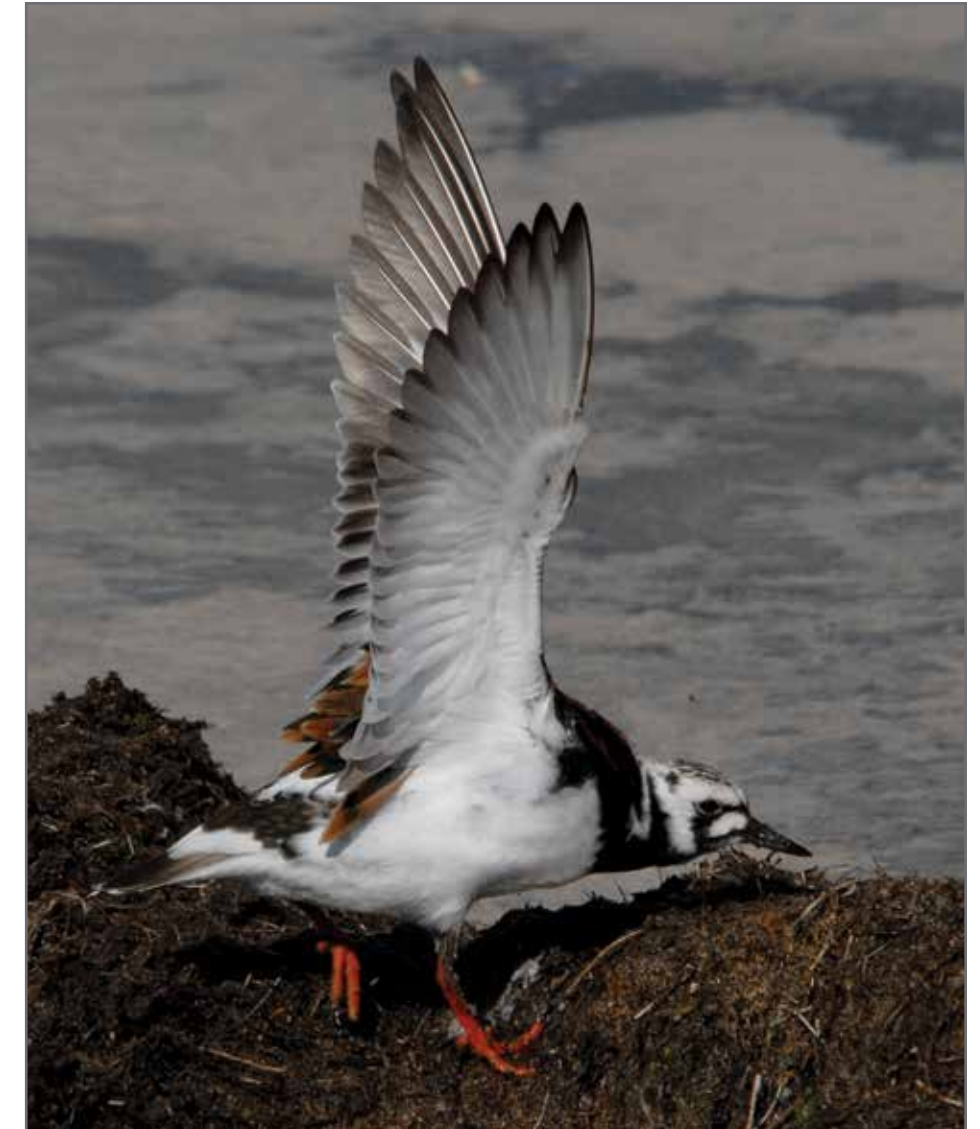


Photo credit: Randy McCulloch

Mystery Photo Spring 2019 (above right)

ANSWER:

The bird shown in the Spring 2019 Mystery Photo is a Ruddy Turnstone (*Arenaria interpres*). The Ruddy Turnstone is one of the most northerly breeding species of shorebirds. They breed in the tundra regions of northern North America and usually lay a four-egg clutch in mid-June. While there are about 350 species of shorebirds in the world, there are only two turnstones — the Ruddy Turnstone and the Black Turnstone — and both of them can be found in North America. In

Saskatchewan, this species can be seen during migration.

Have you taken a picture that may make for a good mystery photo? Send it to the editor for possible inclusion in an upcoming issue.



Nature
SASKATCHEWAN

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