

Manitoba Chimney Swift Initiative:

Final Report to Sustainable Development Innovations Fund

Project #26045

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Manitoba Naturalists Society
401-63 Albert Street
Winnipeg, MB R3B 1G4

Introduction/Executive Summary

In 2006, members of the Manitoba Naturalists Society (MNS) became aware of the rapidly decreasing population of the Chimney Swift (*Chaetura pelagica*). In Canada, available data had indicated a 95% reduction of this species within the last 40 years. In April 2007 the Committee On The Status Of Endangered Wildlife In Canada (COSEWIC) designated the species as threatened. The Chimney Swift population decline has largely been attributed to the reduction of pre-1960s brick chimneys – their primary breeding and roosting habitat. Interested in finding a solution to reverse the steep population decline, the Manitoba Chimney Swift Initiative (MCSI) was created including a Steering Committee with representation from the MNS, municipal, provincial, and federal governments.

Based on habitat creation programs in the southern U.S. and monitoring programs in Ontario and Quebec, the steering committee developed a two-phased approach: 1) Set up a volunteer monitoring program to identify current nesting and roosting sites in Manitoba; and 2) Using the data collected from phase 1, choose high potential sites to place nesting and roosting towers as a means of increasing Chimney Swift breeding and roosting habitat. To realize these goals, the MCSI Steering Committee (via the MNS) applied to the Sustainable Development Innovations Fund (SDIF) and Environment Canada's EcoAction Community Funding Program to cover the costs of a part-time MCSI Coordinator and materials and supplies to build nesting and roosting towers. The MNS subsequently received \$15,000 from SDIF and 46,800 from EcoAction.

With a successful season of monitoring from the middle of May to the middle of August, a number of sites in southern Manitoba were identified as Chimney Swift nesting and roosting habitat. Using the data from the monitoring component of this project, a short list of high potential sites were chosen to build nesting and roosting towers in the spring and summer of 2008. Once constructed, the towers will be monitored for a number of years to determine their effective as swift habitat. In addition, another season of monitoring will take place in 2008.

Phase 1

Monitoring

Over the course of the winter and spring months of 2007, 41 volunteers were recruited to participate with the monitoring component of this project. Sites were defined as active if used at least once by Chimney Swifts for nesting or roosting. Using a standard monitoring protocol and data sheet (appendices 1 and 2) 54 potential sites were monitored in Winnipeg from mid-May to mid-August, with 23 of these verified as being actively used by Chimney Swifts (Appendix 3). An additional 14 active sites (Appendix 4) were discovered outside of Winnipeg in Portage la Prairie (6), St. Adolphe (4), Southport (1), Starbuck (1) and Selkirk (2) for a total of 37 active sites in Manitoba. Based on daytime observations of their behaviour and on counting the number of swifts entering chimneys at sunset, the majority of these sites were identified as nests, with only

one site confirmed as a roost. Located in a large chimney/stack at the Selkirk General Hospital, this roost had a maximum count of 31 swifts observed entering at sunset.

As generally expected, active sites were found in older neighbourhoods where open, unmodified brick chimneys are still present. In Winnipeg, clusters of active chimneys were evident in Wolseley/West Broadway and along Portage Ave in the vicinity of Assiniboine Park. In other areas, chimneys containing swifts were distributed more sparsely. Based on daytime sightings of swifts in areas that were not monitored, it is likely that more chimneys exist that are currently being used by Chimneys Swifts. In Portage la Prairie, active chimneys were located in close proximity to one another in an area of town where older buildings and their attendant chimneys were abundant. Of the six chimneys identified, four could be seen from one vantage point. Similarly, all four chimneys in St. Adolphe were located in close proximity.

Some sites were also only monitored once or twice during the monitoring period, and some were only monitored during the daytime to check for nesting activity. Soon after monitoring of sites began, it was discovered that swifts often entered quickly and quietly into their respective chimneys at sunset. This inconspicuous behaviour meant that observers had to keep a constant eye on their chimneys to capture an entry, an event that can occur in a matter of seconds. For those sites only monitored once or twice, it is possible that some entries may have been missed.

Roosts and Daytime Sightings

The identification of only one confirmed roosting site was somewhat surprising - as more of these sites were anticipated - particularly within Winnipeg where the majority of active sites were located. One explanation for this may be the high concentration of sites located in the downtown area of Winnipeg. Many of these sites consist of larger, commercial brick chimneys suitable for roosts. Perhaps due to the perception of this area as a more dangerous part of the city, and the fact that most volunteers live outside of the downtown, many of these sites were not monitored in the evening. That being said, it is possible that roosting sites exist in the downtown area, especially considering that this area accounts for a large portion of the identified potential chimneys and only a small fraction were monitored at sunset.

In a COSEWIC report on the Chimney Swift, researchers in Quebec noted that the majority of nesting and roosting sites were located within one km of a water source. The explanation for this was based on the premise that swifts are feeding on insects associated with water bodies (lakes, rivers, wetlands, etc.). In light of this finding, the MCSI focused its efforts on monitoring chimneys that were within one km from a water source. As a result, chimneys located outside of this parameter were not monitored, except in instances where incidental sightings occurred. It is therefore possible that chimneys farther away than one km were used as roosts. However, historical records of daytime sightings assembled from the Manitoba Avian Research Committee bird record cards, and daytime sightings from 2007, were closely correlated with water sources.

In addition to the nesting and roosting sites identified in 2007, daytime sightings of chimney swifts (Appendix 5) were reported in Morden, St. Malo, Dauphin, The Pas, and Pinawa. A volunteer monitored one chimney in Dauphin that was used as a roosting site in the past, but did not observe any swifts enter into it. However, the observation took place in late August, so it is likely the case that most swifts had departed south by that time. Aside from St. Malo and Pinawa, swifts were seen in these locations throughout the summer, so it is likely the case that nests and/or roosts exist in these and other locations in southern Manitoba.

Based on data gathered from the monitoring of sites, it appeared that most swifts fledged by early August and that the majority had left their nesting sites by mid-August. From early to mid August, it is likely the case that swifts form fall roosts or join those that were established in the spring and persisted throughout the season (seasonal roosts, ex. Selkirk). Based on monitoring data and daytime sightings, the majority of swifts migrated by the latter half of August. This suggests a short window for discovering fall roosts. However, the presence of a seasonal roost in Winnipeg and/or other locations (in addition to the one in Selkirk) would offer a valuable opportunity to monitor the change in swift numbers throughout the season.

Phase 2

With the data acquired from phase 1, the MCSI Steering Committee identified a number of optimal sites for placing nesting and roosting towers. From this list, the following four sites have been chosen to date:

- Assiniboine Park (Winnipeg)
 - With the discovery of four active chimneys within the area of Assiniboine Park, this area was chosen as a high potential site. Swifts are frequently seen feeding within the park, and have been doing so for decades according to older records. The MCSI Steering Committee has been granted approval from the City of Winnipeg to place a tower in the vicinity of the Conservatory.
- St. Adolphe
 - With the identification of four active chimneys and consistent observation by two volunteers, St. Adolphe was chosen as an ideal location for the placement of nesting and roosting towers. Throughout the duration of the monitoring program, numerous contacts were made and community support for the project grew. On August 7, the council of the RM of Ritchot gave the MCSI their formal support for phase 2 of the project and permission to build nesting and roosting towers.
- Portage la Prairie
 - Portage la Prairie was found to have a high density of active sites, making it an ideal location for placement of nesting and roosting towers. The MCSI Steering Committee made a trip to this location to identify potential sites for tower placement. At this time, permission has been given to the MCSI to build a nesting tower on a site located at the Portage la Prairie Train Station Store.

- Starbuck
 - In Starbuck, a pair of Chimney Swifts successfully nested in the chimney of a residential home. The owners have given the MCSI committee permission to build a nesting tower on their property.

In addition to the sites listed above, the MCSI committee is currently working on procuring two more sites in Winnipeg.

Tower Design

When the Manitoba Chimney Swift Initiative was first formed, the original plan was to build wooden nesting and roosting towers based on designs developed by researchers in Texas. These designs were going to be modified to reflect the difference in climate (with a focus on temperature) that can occur at more northerly latitudes. In particular, towers were to be insulated to keep temperatures above 13°C, a critical temperature at which Chimney Swifts will abandon nests and roosts. Based on recent feedback from researchers in Quebec, it was found to be difficult to modify wooden towers to meet this criterion.

Following the nesting season, the MCSI Steering Committee measured the dimensions of a brick chimney in St. Adolphe that was used as a nesting site. Upon investigation, it was discovered that the walls of the chimney consisted of two layers of brick and measured eight inches thick. The thickness of the chimney indicated a high capacity to maintain internal temperature relative to changes in outside temperature.

Based on this finding, the MCSI Steering Committee opted to build towers constructed of brick due to the greater thermal stability of these structures over wooden ones. The change in design characteristic was also supported by the discovery that a nest site in St. Adolphe was present in a brick chimney that was no longer in use and which was sealed off inside its respective building. The implication of this finding is that the chimney did not receive warmer air moving into it from the building it was attached to. As such, brick nesting and roosting towers will likely be far superior to wooden structures with regard to internal temperature and will also last longer.

To accommodate the change in design specifications, the MCSI Steering Committee sought after a mason and obtained quotes for the cost of building brick Chimney Swift nesting towers. For a 10' structure, the cost came in at \$3,500 per tower, allowing the MCSI to build four towers. However, the characteristics of concrete blocks were examined, and were deemed to have similar thermal dynamic properties to brick. At \$2,000 for a 12' tower, the cost of brick was found to be less costly and would allow the MCSI to build six structures instead of four. As such, the MCSI has therefore decided to build Chimney Swift nesting towers constructed of concrete.

Volunteer Participation and Public Awareness

By the end of August, 41 volunteers had officially participated in the volunteer monitoring portion of the Manitoba Chimney Swift Initiative. Factoring in MCSI Steering Committee meetings and other administrative miscellaneous tasks, over 600 volunteer hours have been contributed to this project. With monitoring continuing in the spring and summer of 2008, many more volunteer hours will likely be accrued. In addition to volunteer involvement and project execution, the MCSI has also committed itself to raising public awareness of the plight of the Chimney Swift and efforts of the MCSI. To this end, the following public awareness activities have taken place:

- two articles in the MNS bulletin
- an article in each of the Metro, Times, Lance, and Herald
- a radio interview on CBC Radio Noon with Marilyn Macki
- an article in the Winnipeg Free Press
- a section of the MNS website devoted to the MCSI project

Future Plans

The MCSI has plans to build six Chimney Swift nesting and roosting towers in Manitoba between April and June of 2008. The towers will be built in areas where Chimney Swifts currently nest as discovered by the 2007 monitoring program. The rationale to do this was based on the following information: 1) Chimney Swifts return to the exact same nesting site each year; and 2) After leaving the nest, juveniles seek out potential sites in the area to use in subsequent years. Therefore, the MCSI developed the strategy to place nesting towers in the vicinity of other nest sites in the hopes that swifts will have a greater chance to discover and use the sights in future years. Furthermore, because of the high nest fidelity to one site, once a tower is used as a nest, there is a high probability that the tower will be used in consecutive years.

In addition to placing the towers in optimal locations, the MCSI Steering committee plans on taking temperature measurements inside the towers to determine how temperature changes inside the tower relative to changes in outside temperature. The MCSI also plans on taking temperature measurements inside of chimneys that were used by nesting swifts to gain a better understanding of the temperature conditions of chimneys. Finally, once built, the towers will be monitored for nesting and/or roosting activity in the upcoming years to determine their success as suitable structures for Chimney Swifts. The results will be used to determine if modifications will be necessary.

During the winter months, it is likely that the MCSI Coordinator will deliver presentations of the Manitoba Chimney Swift Initiative to members of the Manitoba Naturalists Society and local birding groups.

Recommendations

Towers

When the six Chimney Swift towers have been completed, it will likely require a number of years of monitoring to determine their effectiveness as a means of helping to increase the breeding habitat of the Chimney Swift. As such, it is recommended that monitoring of towers continue for a number of consecutive years.

Because of the temperature threshold of 13°C that was discovered by Quebec biologists, it is recommended that internal temperature measurements of the towers be made to compare them to changes in outside temperature. If temperatures inside the towers are found to be under the critical threshold and swifts are not found to use the structures, it may be necessary to consider an internal source of heat.

If the towers are found to be successful, it is recommended that funding be sought after to build additional towers in places where Chimney Swifts are present. As the Manitoba Naturalist Society is a charitable organization, there are a number of potential granting agencies that could be applied to including, but not limited, to the following:

- Shell Environmental Fund
 - http://www.shell.ca/home/content/ca-en/society_environment/environment/protect/support/environment_fund/sf_apply.html
- The Winnipeg Foundation
 - <http://www.wpgfdn.org/seekers.php>
- Habitat Stewardship Program for Species at Risk
 - <http://www.cws-scf.ec.gc.ca/hsp-pih/>
- Endangered Species Recovery Fund
- Special Conservation Fund
 - <http://db.itm.gov.mb.ca/Databases/BRC/Otamiska2003.nsf/a57ebd9fc4912ae786256e14005d2957/40e9ff4c911737e5862571e2005bb88f?OpenDocument>
- TD Friends of the Environment Foundation
 - <http://www.td.com/fef/project.jsp>
- Investors Group EIA Community Projects Fund

On-going Research

The presence of Chimney Swifts in northern latitudes presents an interesting challenge for designing Chimney Swift nesting towers. According to studies in Quebec, there appears to be a critical threshold of 13°C, a temperature below which swifts will abandon towers. At this time, Chimney Swift nesting towers constructed of wood have not been successful in Canada, except for one that was fitted with an internal source of heat. The same researchers also found evidence that 95% of nesting and roosting sites were located within one km of a water source. With many questions yet to be answered, and no indication that the Chimney Swift population will stop declining, it would be an

appropriate time to garner the interest of a student to engage in a masters project on the Chimney Swift population in southern Manitoba (and perhaps northern latitudes in general). Specifically, it would be beneficial to address the following areas:

- Determine the nesting and roosting requirements of Chimney Swifts at northern latitudes with specific regard to the minimum and maximum temperature range inside nesting sites;
- determine if there is a correlation between nesting and roosting sites and proximity to water sources;
- determine the efficacy of using Chimney Swift vocalizations to attract swifts to nesting towers;
- discover seasonal and fall roosts. In particular:
 - study seasonal roosts to estimate breeding success as indicated by changes in roost size from beginning and end of season; and
 - determine where Manitoba swifts roost following breeding
- discover additional sites in Manitoba where Chimney Swifts likely nest and/or roost. For example, in 2007, Chimney Swifts were seen in Morden, Dauphin, The Pas, St. Malo, and Pinawa.

Summary

To find a sustainable and practical approach to reversing the population decline of the threatened Chimney Swift, members of the Manitoba Naturalists Society created the Manitoba Chimney Swift Initiative (MCSI) and formed an MCSI Steering Committee. The committee developed a two-phased approach consisting of monitoring sites to gain a better understanding of the Manitoba population, and to use data collected to choose high potential sites to place Chimney Swift nesting and roosting towers. The MNS received grant funding from the provincial government's Sustainable Development Innovations Fund (SDIF) and federal government's EcoAction program to fund the costs of building the towers and hire a part-time Coordinator.

Following the end of the 2007 monitoring program, the MCSI measured the dimensions of a chimney in St. Adolphe that was used as a nesting site to learn more about nest characteristics. Combining this information with that acquired from studies in Quebec, the MCSI abandoned the wooden tower designs in favour of those constructed of concrete blocks. The resulting design consists of a 12' high tower with outside dimensions of 32" by 32", an inside opening of 16" by 16", and walls that are 8" thick.

With much data gathered from a network of volunteers, the MCSI Steering Committee identified optimal sites to place nesting and roosting towers. Funding is in place for six towers and a mason has been hired to build them. At this time, the committee is in the process of securing permission to place towers at identified sites, with a goal of building all six in the spring and summer of 2008. In addition to monitoring the towers once they have been constructed, a full second season of monitoring is planned to take place in 2008.

Appendix 1: Chimney Swift Monitoring Protocol

Chimney Swift Monitoring Protocol

General Overview

Arrive at your site half an hour before sunset and stay until half an hour after sunset. If possible, try to conduct your survey on each Wednesday of the week. However, if Wednesday's won't work, try to use Tuesday or Thursday as an alternate. If neither of these days works, choose one of the remaining four days of the week to monitor your site, as the ultimate goal is to get coverage of as many sites as possible. However, if the weather is cold and/or rainy, swifts may stay inside their chimneys until the return of nicer weather. It is therefore recommended that monitoring take place on days that are not raining and/or unseasonably cold. If this means surveying your site on a day other than Wednesday, try to do so. Upon arriving at your site, fill out the first four columns of the data sheet, then the next three if you observe swifts entering your site. If you have anything to note, regardless of presence or absence of swifts, please enter this in the last column (underneath comments).

Filling Out the Data Sheet

Name of Observer(s)

- Write down the name of the observer(s).

Contact Info

- Write down the email address or phone number of each observer.

Location of Site

- If you know the address of your site, write it down. If this is unknown, please write down the approximate location of the site. For example, "building on the west side of Banning St., north of Portage Ave behind Shoppers Drug Mart".

Type of Building

- Write down the type of building you are monitoring (for ex., apartment, school, church, etc.). If you are unsure of the type of building, write down "unknown".

Type of Structure

- Write down the type of structure being used, or potentially used, by the swifts that you are monitoring. In most cases, this will be a brick chimney. However, swifts have also used larger, cylindrical smoke stacks, hollow trees, and other structures.

Date

- Write down the date of each observation.

% Cloud Cover

- Look up at the sky and estimate the percentage covered by clouds. For example, if you think that one quarter of the sky contains cloud cover, write down "25%". If no clouds are present, write down "0", and so on.

Wind

- Using the Beaufort Scale (attached) estimate the strength of wind.

Temperature

- If you know the temperature at the beginning of the observation period, enter it. If you don't know it, write "unknown".

Entry Time of First Bird

- Record the time that the first Chimney Swift enters the roost/nest.

Entry Time of Last Bird

- Enter the time that the last Chimney Swift enters the roost/nest.

Number of Swifts

- Record the total number of swifts that entered into the nest/roost. If no swifts were present, write down “no swifts”. However, if no swifts enter into your nest/roost, but you see swifts in the area, note this in the comments section.

Comments

- If you observe anything that you feel is worth noting while monitoring your site, please enter this in the comments section. Even if you don't observe swifts entering your site, you may notice something that could potentially influence the presence or absence of swifts. For example, the presence of a Merlin (a small species of falcon) or other bird of prey in the area near your site may discourage entry into the nest/roost at the time of your observation.
- Although it is assumed that monitoring will take place under generally conducive weather conditions, due to time constraints/commitments, it may be the case that you monitor your site on a day that is less favourable. It may also be the case that the weather changes rapidly as can sometimes happen in the summer. If it rains, becomes completely overcast, or the weather makes a noticeable change, please note this in the comments section.

Submitting Your Monitoring Data/Observations

For those who have access to a computer and possess an email address, the data sheets can be filled out electronically and emailed to the MCSI Coordinator at mikequigley@winnipeg.ca. For those who do not, the data sheets can be filled out manually and mailed to the MCSI Coordinator using the self-addressed, stamped envelope. We are asking that participants send their data to the MCSI Coordinator once every two weeks so that updates can be sent out to all participants on a bi-weekly basis. For those who do not have access to email, the MCSI Coordinator will contact you by phone, or you can also contact the MCSI Coordinator at 986-7324.

As this project utilizes a sunset protocol, it can only infer the presence of nesting birds. Although the presence of two birds entering a site at sunset would suggest a nesting pair, sometimes one or two helper birds will participate. So the presence of three, and sometimes four, birds entering a site at sunset does not necessarily designate the site as a roost only. As non-breeding swifts feed during the day and only enter the roost at sunset, the presence of swifts entering and exiting a chimney during the day will reveal the site as being used for nesting purposes. Please feel free to observe your site during the daytime if you would like to determine if it is being used as a nest. If you do observe this, please pass along this info to the MCSI Coordinator. Also, please forward any sightings you have of Chimney Swifts during the daytime.

As this project is built upon the foundation of volunteers, the MCSI Steering Committee would once again like to offer their sincere thanks for your generous time and support.

Appendix 2: Monitoring Data Sheet

MANITOBA CHIMNEY SWIFT SURVEY

Name of Observer(s): _____

Contact Info (email address and/or phone number): _____

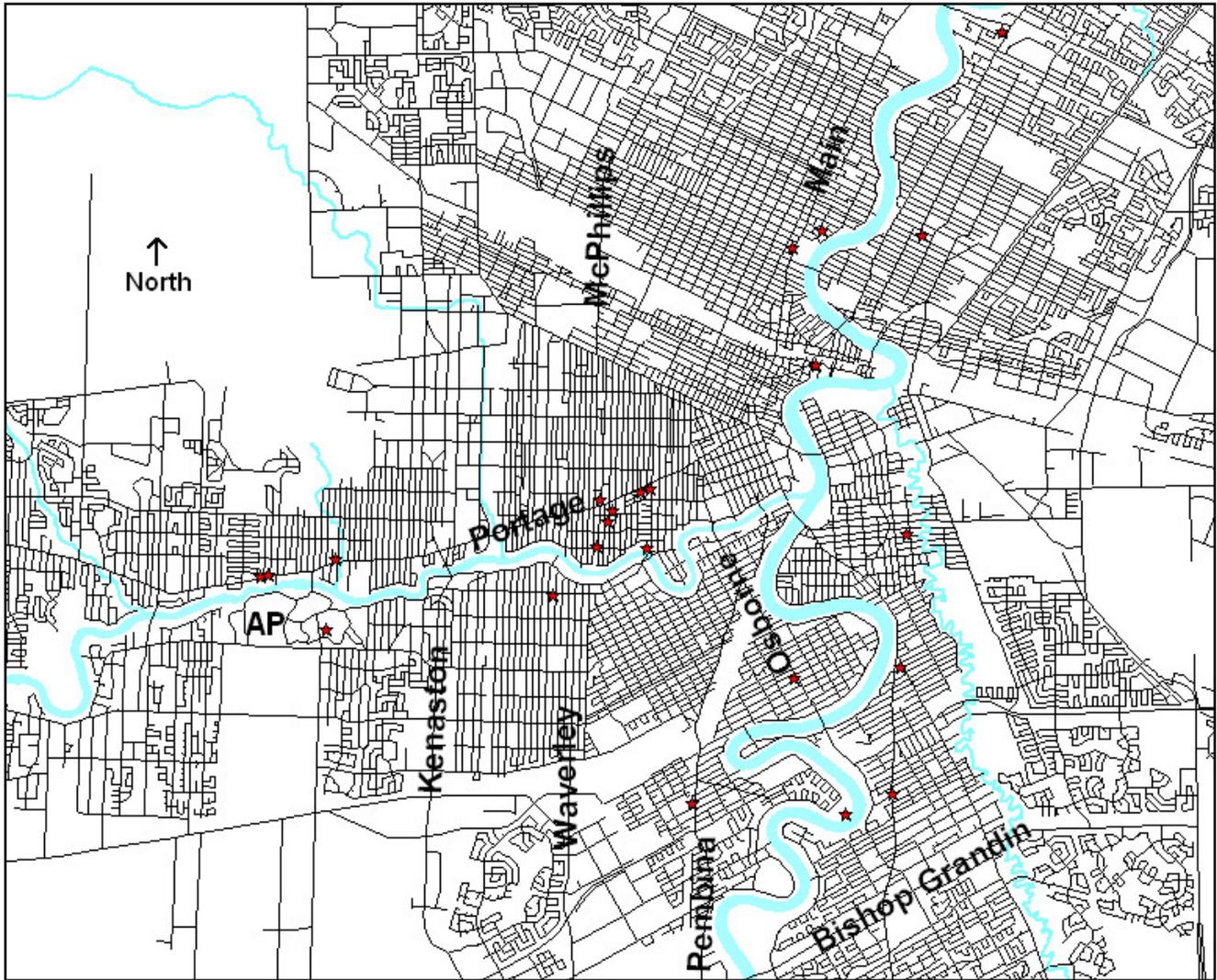
Location of Site Surveyed (address, street names, etc): _____

Type of Building (ex. school, apartment, church, commercial building, etc): _____

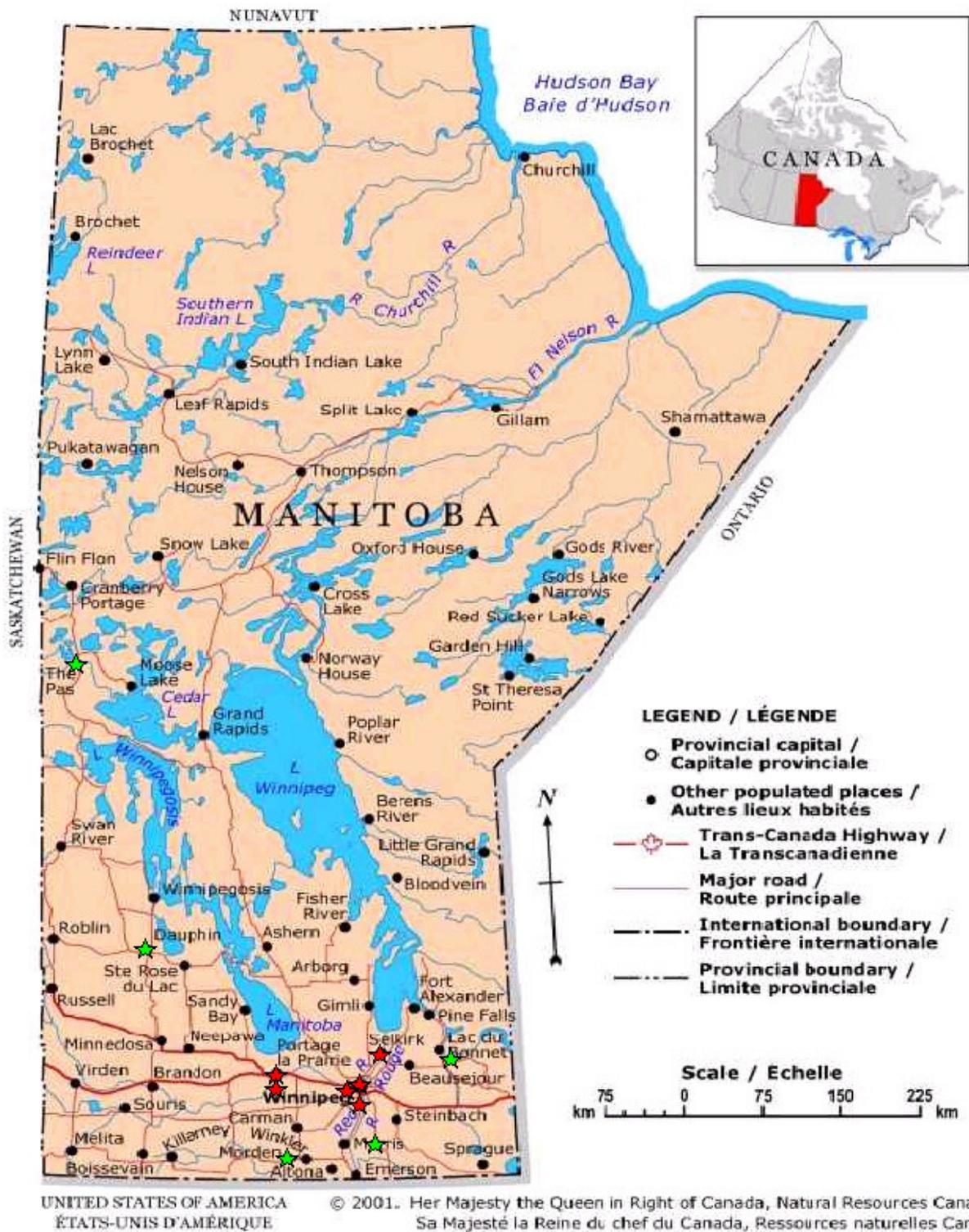
Type of Structure on Building (ex. brick chimney, smoke stack, hollow tree, etc): _____

| Date | % Cloud Cover | Wind | Temp °C | Entry time of first bird | Entry time of last bird | Number of Swifts | Comments |
|-------------|----------------------|-------------|----------------|---------------------------------|--------------------------------|-------------------------|-----------------|
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Appendix 3: Location of Winnipeg Sites Containing Chimney Swifts in 2007



Appendix 4: Active Sites and Daytime Sightings of Chimney Swifts in Manitoba in 2007



- ★ Active Sites
- ☆ Daytime Sightings

Appendix 5: Past and Present Daytime Sightings of Chimney Swifts in Manitoba

| Location | Year(s) |
|--------------------|-------------------------------|
| Altona | 1983 |
| Balmoral | 1924 |
| Bissett | 1995 |
| Dauphin | 2007 |
| Delta Marsh | 1982 |
| East St Paul | 1983,1985,1987,1989,2007 |
| Falcon Lake | 1991 |
| Gimli | 1922,1923 |
| Mafeking | 1992 |
| Morden | 1970,2007 |
| Oak Hammock Marsh | 1974,1984 |
| Pinawa | 1988,2007 |
| Portage la Prairie | 2007 |
| Selkirk | 1965,1979,2007 |
| Souris | 1983,1984 |
| Southport | 2007 |
| St Ambroise | 1974 |
| St. Adolphe | 2007 |
| St. Malo | 2007 |
| Starbuck | 2007 |
| Stonewall | 1967,1984 |
| Teulon | 1955 |
| The Pas | 2007 |
| Victoria Beach | 1922 |
| Waugh | 1923 |
| Winnipeg | 1921,1962,1964,1965,1973-2007 |