Chimney Swift Conservation Program

A Citizen Science Program of the Maryland Bird Conservation Partnership
to benefit *Species of Greatest Conservation Need*
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Updated 2/27/2020
Overview

There are 143 Species of Greatest Conservation Need defined in Maryland’s State Wildlife Action Plan (SWAP).1 Several of these species readily take to artificial (man-made) nesting structures (“habitat”). Programs to build, install, and monitor nest structures for these species exist across the country and even around the world. Maryland has a few established nest box programs, but to date there has been no effort that provides a central point of coordination and support to tie these programs together. The Maryland Bird Conservation Partnership is beginning such an effort. To have a successful state-wide initiative such as this, local groups need to be engaged and participating. In Maryland, there are 15 chapters of the Maryland Ornithological Society (MOS)2 that operate at the county level (see Appendix I). Audubon Maryland-DC has 5 local chapter, two Audubon Centers, and 6 chapter-owned sanctuaries3 (see Appendix II). Nest box programs for American Kestrels and/or Barn Owls are already in place to varying degrees in Frederick, Montgomery, Calvert, and St. Mary’s Counties. MOS and Audubon chapters are at the heart of these existing nest box programs. Efforts to install Chimney Swift towers are not yet as robust, but individuals involved in bird club chapters have expressed interest in a state-wide effort to coordinate installations and data collection. A state-wide coordination includes guidance on construction, siting, and maintenance of nesting structures, as well as a standardized monitoring program for consistency in data collection to aid analysis of productivity. The Chimney Swift Conservation Program Recovery Goal sets the strategic direction to arrest or reverse the decline of swifts in Maryland. This includes the following objectives, which are detailed in parts 3 and 4 of this document:

1. Assess the population – distribution, abundance, trends and threats
2. Identify, protect, and restore critical habitats
3. Increase the availability of nest sites within critical habitats
4. Public awareness

For American Kestrel and Barn Owl nest box information, see our sister publication, Maryland Farmland Raptor Program.

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1 http://dnr.maryland.gov/wildlife/Pages/plants_wildlife/SWAP_home.aspx
2 https://mdbirds.org/join/chapters/
3 http://md.audubon.org/chapters-centers/marylands-centers-chapters-0
Decline of Aerial Insectivores

As a group, aerial insectivores—birds that eat flying insects—are declining rapidly. Aerial insectivores include swifts, nightjars, and swallows. As the graphic\(^4\) at the right shows, the number of breeding adult aerial insectivores has declined 32\% since 1970, a loss of 160 million birds. Barn Swallows have declined 40\%, but more significantly, swifts have lost more than 19 million birds, a staggering 65\% decline since 1970\(^5\).

Aerial insectivores are extremely sensitive to environmental change. The increased effectiveness and use of agricultural insecticides such as synthetic neonicotinoids and chlorpyrifos have greatly reduced their prey base of flying insects. Neonicotinoids are also suspected in declines of native pollinators. Decreasing pesticide use, in agriculture and around the home, will benefit bees and butterflies as well as aerial insectivores.\(^6\)

The family name for swifts, Apodidae, is derived from the Greek ἄπους (ápous), meaning "footless", a reference to the small, weak legs of these most aerial of birds.\(^7\) There are four regularly occurring swift species in the United States: Black Swift (Cypseloides niger), Chimney Swift (Chaetura pelagica), Vaux's Swift (Chaetura vauxi), and White-throated Swift (Aeronautes saxatalis). Swifts are in the taxonomic Order—Caprimulgiformes—as nightjars and hummingbirds.

(Photos courtesy All About Birds, The Cornell Lab\(^8\))

The tables below (Figure 1) shows the estimated global population sizes and trends\(^9\) for these swift species. Since 1970, population declines range from 48\% to 94\% for these four swifts. At current rates of decline, Chimney Swift and Vaux's Swift will loose 50\% of their remaining populations in 27 and 16 years, respectively.

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\(^4\) [https://www.3billionbirds.org/](https://www.3billionbirds.org/)
\(^5\) [http://science.sciencemag.org/cgi/content/full/science.aaw1313](http://science.sciencemag.org/cgi/content/full/science.aaw1313)
\(^7\) [https://en.wikipedia.org/wiki/Swift](https://en.wikipedia.org/wiki/Swift)
\(^8\) [https://www.allaboutbirds.org/guide/browse/taxonomy/Apodidae](https://www.allaboutbirds.org/guide/browse/taxonomy/Apodidae)
<table>
<thead>
<tr>
<th>Common Name</th>
<th>Global Pop Size</th>
<th>PS-g</th>
<th>BD-g</th>
<th>ND-g</th>
<th>TB-c</th>
<th>TN-c</th>
<th>PT-c</th>
<th>Continental Concern</th>
<th>Pop Change</th>
<th>BBS half-life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chimney Swift</td>
<td>8,800,000</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>Watch List—d</td>
<td>-67%</td>
<td>27</td>
</tr>
<tr>
<td>Black Swift</td>
<td>210,000</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>Watch List—d</td>
<td>-94%</td>
<td>16</td>
</tr>
<tr>
<td>Vaux's Swift</td>
<td>700,000</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td></td>
<td>-50%</td>
<td>106</td>
</tr>
<tr>
<td>White-throated Swift</td>
<td>1,200,000</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td></td>
<td>-48%</td>
<td>ne</td>
</tr>
</tbody>
</table>

XX-g Global  XX-c Continental  d=Prevent Decline

Scores from 1 (low) to 5 (high) vulnerability
- PT-c Population Trend
- TN-c Threats to Nonbreeding Habitat
- TB-c Threats to Breeding Habitat
- ND-g Nonbreeding Distribution
- BD-g Breeding Distribution
- PS-g Population Size

Figure 1. Data from the Partners in Flight Population Estimates and Avian Conservation Assessment databases.
Chimney Swifts

The Partners in Flight Population Estimates Database\textsuperscript{10} documents a 67\% population decline in Chimney Swifts from 1970-2014. The Appalachian Mountain Joint Venture and Atlantic Coast Joint Venture list the Chimney Swift as High Priority in their Priority Bird Species of Conservation Concern list. The Audubon/American Bird Conservancy Watch List puts the species on the Yellow List with the priority to reverse population declines.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{IUCN_status_Chimney_Swift.png}
\caption{IUCN status for Chimney Swift}
\end{figure}

The \textbf{Chimney Swift} (\textit{Chaetura pelagica}) was added to the Red List of the International Union for Conservation of Nature and Natural Resources (IUCN) in August 2018\textsuperscript{11} (Figure 2). The Cornell Lab of Ornithology analyzed eBird data from 2004-2016 to develop a thorough breeding distribution map\textsuperscript{12} but did not analyze populations trends. \textbf{Breeding Bird Survey trends show a xx\% range-wide decline/increase from 1966-201x.} In recent years, the number of available chimneys (their nesting “habitat”) has decreased as a result of the demolition of old buildings, the capping of old chimneys, and through chimney sweeps removing nests from chimneys during the nesting season (despite the species being protected by federal law). Even though a scarcity of chimneys may not be limiting the numbers of Chimney Swifts yet, the rate of habitat loss is increasing and possibly developing into a severe threat. As stated above, the decline of insects may contribute to fewer food resources and possibly a shifting of insect prey from their historical diet.\textsuperscript{13}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{IUCN_status_Chimney_Swift.png}
\caption{IUCN status for Chimney Swift}
\end{figure}

\textsuperscript{10} \url{http://pif.birdconservancy.org/PopEstimates/}
\textsuperscript{11} \url{https://www.iucnredlist.org/species/22686709/131792415}
\textsuperscript{12} \url{https://ebird.org/science/status-and-trends/chiswi/}
\textsuperscript{13} Finity, Leah & Smol, John & Kurt Kysers, T & Reudink, Matthew & Blais, Jules & Grooms, Christopher & Nocera, Joseph. (2010). Historical declines in chimney swift populations are associated with dramatic changes in insect prey consumption.
Nesting

Chimney Swifts originally nested in natural sites such as caves and hollow trees of old-growth forests. While one may occasionally find swifts nesting in these natural sites, Chimney Swifts now nest primarily in chimneys and other artificial sites with vertical surfaces and low light, including air vents, old wells, abandoned cisterns, outhouses, boathouses, garages, silos, barns, lighthouses, firewood sheds, and structures built specifically for their use. Both members of a breeding pair may fly toward several potential nest locations, then cling side by side at one particular site, with one member of the pair giving a rhythmic chipping call. Only one nest is constructed in any location, regardless of the size of the site.

The nest is a half-saucer of loosely woven twigs or pine needles, gathered in flight from the tips of standing trees by grasping with the feet. The selected matter is snapped off and transferred to the bill. In the nesting site, the material is stuck together and cemented to the inside of the vertical wall with the bird’s glue-like saliva. Both parents independently contribute to the nest: they break off small twigs with their feet while flying through branches, then return to the nest site with the twigs in their bills. The completed nest measures 2–3 inches from front to back, 4 inches wide, 1 inch deep, and contains about 265 individual pieces.\(^\text{14}\)

Maryland Status

The *Atlas of Breeding Birds of Maryland and the District of Columbia* has been conducted two times: 1983-1987\(^{15}\) and 2002-2006\(^{16}\). Chimney Swifts are found throughout the state; fewer birds are found in western Maryland and the on the Eastern Shore away from populated areas (Figure 3). The total number of atlas blocks with evidence of breeding dropped by less than 0.5%. Changes in the number of blocks where Chimney Swifts were detected were 3% or less in every atlas region except in one (Figure 3). The Upper Chesapeake atlas region showed a 14% decline in the number of blocks in which Chimney Swifts were detected. Changes in the distribution of where swifts were detected showed areas of gains and losses scattered throughout the different regions. The Eastern Shore had about 25 with gains as well as the same number of blocks with losses. It is important to note that the purpose of an atlas project is to document the distribution of species, and not the population. There is no way to determine how many nests per block existed in either atlas period.

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**Figure 3.** Distribution of Chimney Swifts in the second Breeding Bird Atlas project.

**Figure 4.** Change in distribution within the six atlas regions for detections of Chimney Swift between the 1st and 2nd atlas projects.

**Figure 5.** Change in distribution of atlas blocks with detections for Chimney Swift between the 1st and 2nd atlas projects.

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In the Partners in Flight (PIF) *Avian Conservation Assessment Database*\(^{17}\), each species is assigned scores for 6 factors, assessing largely independent aspects of vulnerability: Population Size (PS), Breeding (BD) and Non-breeding Distribution (ND), Threats for Breeding (TB) and Non-breeding (TN) seasons, and Population Trend (PT). Each score reflects the degree of vulnerability for the species (i.e., risk of significant population decline, major extirpation or extinction) due to that factor, ranging from “1” for low to “5” for high vulnerability. Scores are combined in various ways to produce an overall assessment of vulnerability, determine Watch List status and identify other categories of concern.

The PIF *Population Estimates Database* is intended to provide access to the latest USA/Canada landbird population estimates at a variety of geographic scales (global, continental, national, Bird Conservation Region, state and province).\(^{18}\) Maryland is a part of three Bird Conservation Regions\(^{19}\) (BCRs):

- BCR 28 - Appalachian Mountain
- BCR 29 - Piedmont
- BCR 30 - New England/Mid-Atlantic Coast

Chimney Swifts show a Population Trend score of 5, high vulnerability. Along with the Threats for Breeding score of 4 and a population decline of 67% between 1970 and 2014, the species is placed on the Watch List as Yellow, with the needed action of preventing further population declines (Figure 5).

The PIF BCR populations estimates for Chimney Swifts concur with the regionals data from the Breeding Bird Atlas, with 55-60% of the population in the coastal plain, 25-30% in the Piedmont, and about 10% in western Maryland.

The *North American Breeding Bird Survey (BBS)* is a large-scale survey of North American birds. It is a roadside survey, primarily covering the continental United States and southern Canada, although survey routes have recently been initiated in Alaska and northern Mexico. The BBS was started in 1966 and now contains over 5,000 survey routes which are surveyed in June by experienced birders.

The primary objective of the BBS has been the estimation of population change for bird encountered along roadsides. However, the data have many potential uses, and investigators have used the data to address a variety of research and management objectives.

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\(^{17}\) [http://pif.birdconservancy.org/ACAD/](http://pif.birdconservancy.org/ACAD/)

\(^{18}\) [http://pif.birdconservancy.org/PopEstimates/](http://pif.birdconservancy.org/PopEstimates/)

\(^{19}\) [http://nabci-us.org/resources/bird-conservation-regions/](http://nabci-us.org/resources/bird-conservation-regions/)
Trend analysis for Maryland from 1966-2015 shows a decline of **2.19% per year** from 1966-2015. For the 11-year period from 2005-2015 the species declined at a higher rate of 2.78% per year.20

<table>
<thead>
<tr>
<th># routes</th>
<th>Trend (95% CI)</th>
<th>Trend (95% CI)</th>
<th>RA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chimney Swift</td>
<td>71</td>
<td>-2.19 (-2.77, -1.62)</td>
<td>-2.78 (-4.82, -0.69)</td>
</tr>
</tbody>
</table>

*Figure 6. Trend analysis graph showing a 2.19% population decline per year in Maryland from 1966-2015. The average relative abundance (RA) during that timeframe is 17.6.*

20 [https://www.mbr-pwrc.usgs.gov/cgi-bin/atlasa15.pl?MD&2&15&csrfmiddlewaretoken=3YKakk7LxT2ki6NSpI4mstudYCqdW02C](https://www.mbr-pwrc.usgs.gov/cgi-bin/atlasa15.pl?MD&2&15&csrfmiddlewaretoken=3YKakk7LxT2ki6NSpI4mstudYCqdW02C)
Chimney Swift Programs

National


Regional

Audubon Society of Western Pennsylvania (ASWP) began a Chimney Swift program to support swift conservation throughout the region. Through a variety of partnerships, ASWP has installed almost 150 Chimney Swift towers in Southwestern Pennsylvania. They launched a Chimney Swift Tower monitoring initiative in 2017. According to Brian Shema (Operations Director) and Sarah Koenig (Conservation Director), the cost per tower has run between $500-$700, depending on the style and the materials used for roofing. There are two types of towers – kiosk (includes interpretive panels) and non-kiosk. They highly recommend the Chimney Swift tower book mentioned above. It takes approximately 12 hours from start to finish for someone with carpentry skills. Once you do one it gets faster/easier. They pulled together about $200,000 from a foundation and two agencies to fund construction of 150 towers with interpretive panels. They are willing to answer any questions we may have along the way of getting our program initiated.

Audubon North Carolina has a Chimney Swift fact sheet and tower construction fact sheet on their web site. The tower fact sheet has “a few modifications (tried and true from the Audubon Society of Western Pennsylvania)”. They indicate you can register your swift tower on their web site, but I found no such registry on the designated page. In North Carolina, local Audubon chapters have organized several conservation projects to protect Chimney Swifts. Wake Audubon Society in Raleigh named the Chimney Swift its Bird of the Year from 2011 to 2012 to raise awareness about this special bird. They also helped build a swift tower at the Prairie Ridge Eco Center where research will be conducted on this unusual bird.

21 http://www.chimneyswifts.org/
22 http://www.aswp.org/pages/audubon-s-chimney-swift-tower-initiative
23 Personal communication by Director of the Maryland Bird Conservation Partnership, 12/11/2018.
Chimney Swift Recovery Goal

The purpose of the Maryland Farmland Raptor Program is to stabilize and begin to increase Chimney Swift populations in Maryland. The Recovery Goal sets the strategic direction to arrest or reverse these declines. This includes the following objectives:

1. Assessment of the population – distribution, abundance, trends and threats.
2. Identification, protection and restoration of critical nesting habitats
3. Increase the availability of nest sites within critical habitats
4. Public awareness

Chimney Swift Recovery Objectives

1. Assessment of the population
   A. Develop and implement survey protocol for Chimney Swift sightings and reports of nesting and roosting
      i. Maintain a central database for sightings, survey results, nest site locations etc. Share with project partners
      ii. Create promotional products for recruiting and training citizens for reporting
      iii. Develop a vetting process for determining the validity of the reports
   B. Conduct spring and fall roost surveys
      i. Identify roost locations
      ii. Train volunteers on Swift Night Out protocols
   C. Determine recruitment, nest site fidelity, seasonal movements and natal dispersal of the regional population
      i. Band and retrap as many Chimney Swifts as possible
      ii. Utilize the most recent and relevant tracking techniques available, including Motus
      iii. Install tracking towers at strategic locations
   D. Identify the threats and limiting factors facing the regional populations
      i. Determine mortality through tracking methods

2. Identification, protection and restoration of critical habitats
   A. Determine the characteristics of sufficient and suitable habitat
      i. Create and evaluation system (criteria and methodology) to determine the suitability of habitat for American Kestrels
   B. Conduct neighborhood assessments to determine the availability of uncapped chimneys

3. Increase availability of nest sites in critical habitats
   A. Identify areas where Chimney Swifts are present
      i. Conduct surveys outlined above
      ii. Recruit and train volunteers
   B. Distribute flyers about Chimney Swifts in areas with capped chimneys
   C. Build and install towers where lack of suitable chimneys exits

4. Public Awareness
   A. Promote the protection and conservation need of Chimney Swifts
i. Produce and distribute various informational products to the media
ii. Provide presentations to targeted audiences
iii. Develop partnerships with chimney sweeps across the state
iv. involve the public in citizen science opportunities where appropriate

Knowledge Gaps

Extensive knowledge gaps pertaining to the American Kestrel ecology in Maryland exists, including distribution, movements, abundance, recent population trends, habitat needs, and threats.

Monitoring and Data Entry

Monitoring a Chimney Swift tower is most effectively done with nest cams. These can be a type that only broadcast over Bluetooth so a smartphone or tablet can pick up the signal and view the nest. Alternately, the web streaming nest cam can connect to a computer for continuous viewing by a home computer or a nature center, which is a great education and public relations tool. If using a nest cam of some sort, an infrared camera is recommended. Off-the-shelf infrared cameras generally emit some light, which can stress the swifts. The Chimney Swift Conservation Association has developed equipment that is well-suited for monitoring swift nests or roosts.

Nesting and roosting data will be entered into NestStory. Appendix 5 shows the information that will be stored in NestStory for each swift tower. Information for chimney nest sites will be similar.

Estimated Program Costs

Table 1 below shows the cost of materials for nesting structures. The cost of materials for swift towers is generally $500-$700, depending on the style. It is recommended that every group installing swift towers has at least one copy of each book listed in Table 1.

<table>
<thead>
<tr>
<th>Estimated unit costs</th>
<th>Materials</th>
<th>Interpretive panels</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chimney Swift tower</td>
<td>$700</td>
<td>$200</td>
<td>$900</td>
</tr>
<tr>
<td>Nest camera (optional)</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Book</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chimney Swift Towers: New Habitat for America's Mysterious Birds&lt;sup&gt;27&lt;/sup&gt;</td>
<td>$13</td>
</tr>
<tr>
<td>Chimney Swifts: America's Mysterious Birds above the Fireplace&lt;sup&gt;27&lt;/sup&gt;</td>
<td>$17</td>
</tr>
</tbody>
</table>

<sup>27</sup> Available from the Maryland Bird Conservation Partnership.

*Table 1. Estimated costs for a Chimney Swift tower. See Figure 4 for an interpretive panel sample.*
For a state-wide program, Table 2 shows a suggested number of nesting structures with estimated costs. This is based on five swift towers per county. This is a starting point, with the intention that the interest and demand will continue to grow.

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit cost</th>
<th>Units</th>
<th>Total</th>
<th># Counties</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chimney Swift tower²⁸</td>
<td>$900</td>
<td>5</td>
<td>$4,500</td>
<td>23</td>
<td>$103,500</td>
</tr>
<tr>
<td>Chimney Swift books</td>
<td>$30</td>
<td>1</td>
<td>$30</td>
<td>23</td>
<td>$690</td>
</tr>
<tr>
<td><strong>Total - Chimney Swift</strong></td>
<td><strong>$104,190</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Estimated costs for a state-wide implementation with an average of 5 swift towers in each of Maryland’s 23 counties.

Fundraising

To fund the program, money from grants, foundations, and donations/gifts will be pursued. MOS or Audubon chapters/centers may choose to contribute or raise funds. Fundraising can include an adopt-a-nest or adopt-a-bird program. An additional component (and cost) that might be considered is installation of a nest cam. While this is an added cost, it is also an additional fundraising opportunity which may appeal to additional donors.

These costs are for budgeting purposes and a county/group can tailor a plan to fits its needs, interests, available volunteer pool, and funding.

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²⁸ This is the high-end cost for a tower with a kiosk and interpretive panels.
Appendix I. Maryland Ornithological Society chapters

- Allegany & Garrett County Bird Club
- Anne Arundel Bird Club (Anne Arundel, Charles, Calvert, St. Mary’s)
- Baltimore Bird Club (Baltimore City and County)
- Caroline County Bird Club
- Carroll County Bird Club
- Cecil Bird Club
- Frederick Bird Club
- Harford Bird Club
- Howard County Bird Club
- Kent County Bird Club (Kent, Queen Anne’s)
- Montgomery Bird Club
- Patuxent Bird Club (Prince George’s)
- Talbot Bird Club (Talbot, Dorchester)
- Tri-County Bird Club (Wicomico, Somerset, Worcester)
- Washington County Bird Club

29 https://mdbirds.org/join/chapters/
Appendix II. Audubon Maryland-DC centers, sanctuaries, and chapters

Centers and Sanctuaries of Audubon Maryland-DC:

**Pickering Creek Audubon Center**, Easton, MD - *sanctuary owned by Chesapeake Audubon Society, managed by National Audubon Society*

**Patterson Park Audubon Center**, Baltimore, MD - *park owned by Baltimore City Recreation and Parks, managed by National Audubon Society*

**Audrey Carroll Audubon Sanctuary**, Frederick County – *Audubon Society of Central Maryland*

**Farm Creek Sanctuary**, Dorchester County – *Chesapeake Audubon Society*

**Fran Uhler Natural Area**, Prince George’s County, *managed by the Prince George’s Audubon Society and the Maryland National Capital Parks and Planning Commission.*

**Fred Archibald Audubon Sanctuary**, Frederick County – *Audubon Society of Central Maryland*

**High Banks Wildlife Sanctuary**, Talbot County – *Chesapeake Audubon Society*

**Nanjemoy Marsh Sanctuary**, Charles County – *Southern Maryland Audubon Society*

In addition to the centers and sanctuaries of Audubon Maryland-DC, five local Audubon chapters are active in Maryland and the District of Columbia. Chapters enable Audubon members and others to meet and share an appreciation of their common interests. They create a culture of conservation in local communities through education and advocacy, focusing on the conservation of birds, other wildlife, and conservation of important habitats. Visit your local chapter today!

**Southern Maryland Audubon Society**

**Prince George's Audubon Society**

**Chesapeake Audubon Society**

**Audubon Society of Central Maryland**

**Audubon Society of the District of Columbia**

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30 [http://md.audubon.org/chapters-centers/marylands-centers-chapters-0](http://md.audubon.org/chapters-centers/marylands-centers-chapters-0)
Appendix III. Chimney Swift Relative Abundance, eBird data 2004-2016

Appendix IV. Chimney Swift Relative Abundance, BBS data

Chimney Swift *Chaetura pelagica*
BBS Summer Distribution Map, 2011 - 2015

## Appendix V. ASWP\textsuperscript{33} Chimney Swift Tower Data Collection

<table>
<thead>
<tr>
<th>Tower Number</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tower Location (address or general)</td>
<td></td>
</tr>
<tr>
<td>Tower Type</td>
<td></td>
</tr>
<tr>
<td>- Kiosk 8 leg</td>
<td></td>
</tr>
<tr>
<td>- Kiosk 4 leg</td>
<td></td>
</tr>
<tr>
<td>- Kiosk other ________________________</td>
<td></td>
</tr>
<tr>
<td>- Standard Tower</td>
<td></td>
</tr>
<tr>
<td>- Tower other</td>
<td></td>
</tr>
<tr>
<td>- N/A</td>
<td></td>
</tr>
<tr>
<td>Chimney Type</td>
<td></td>
</tr>
<tr>
<td>- Natural wood</td>
<td></td>
</tr>
<tr>
<td>- Chimney</td>
<td></td>
</tr>
<tr>
<td>- Other ________________________</td>
<td></td>
</tr>
<tr>
<td>- N/A</td>
<td></td>
</tr>
<tr>
<td>Intended Use</td>
<td></td>
</tr>
<tr>
<td>- Breeding</td>
<td></td>
</tr>
<tr>
<td>- Roosting</td>
<td></td>
</tr>
<tr>
<td>Surroundings (check all that are applicable)</td>
<td></td>
</tr>
<tr>
<td>- Park</td>
<td></td>
</tr>
<tr>
<td>- Riverfront trail</td>
<td></td>
</tr>
<tr>
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<td>- Meadow</td>
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<tr>
<td>- Turf grass</td>
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<tr>
<td>- Natural water feature</td>
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</tr>
<tr>
<td>- Private residence - high density</td>
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<tr>
<td>- Private residence - medium density</td>
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</tr>
<tr>
<td>- Private residence - low density</td>
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<tr>
<td>- Other _____________________</td>
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<tr>
<td>Date Installed / Identified</td>
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<tr>
<td>Aspect</td>
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<tr>
<td>Orientation (in degrees)</td>
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<td>Distance to road</td>
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<tr>
<td>Distance to taller structure</td>
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<td>Distance to power lines</td>
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<tr>
<td>Color</td>
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<td>Depth (inches)</td>
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</tr>
<tr>
<td>Exterior Height (inches)</td>
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</tr>
<tr>
<td>Interior Height (inches)</td>
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</tr>
<tr>
<td>Predator guard</td>
<td></td>
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<td>- Yes</td>
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<tr>
<td>- No</td>
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<td>Other comments</td>
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Unique ID for GPS Coordinates __________ Photo ID ________________

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\textsuperscript{33} Audubon Society of Western Pennsylvania