

Bird Habitat Assessment Report and Recommendations for the T. S. Roberts Bird Sanctuary

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Project Outcomes

There are three outcomes that this project is intended to accomplish:

1. Assess avian habitat on the Thomas Sadler Roberts Bird Sanctuary;
2. Identify implementation tasks to improve avian habitat; and
3. Outline an ongoing habitat preservation strategy.

The current report is intended to accomplish the first goal as well as to lay a foundation for accomplishing the second and third goals. The latter two goals can only be completed following public involvement.

The current project has used the existing Thomas Sadler Roberts Bird Sanctuary Management Plan (Minneapolis Park and Recreation Board, 2014) to the maximum extent possible. That plan is a quality, up-to-date document that includes extensive historical, contextual, and baseline natural resource inventory information. A summary of the 2014 plan that precedes the Table of Contents in the plan is reproduced in the next section.

Summary of 2014 Thomas Sadler Roberts Bird Sanctuary Management Plan

“The Thomas Sadler Roberts Bird Sanctuary (Sanctuary) is located in Lyndale Park, part of Minneapolis’ popular Chain of Lakes Regional Park in southwest Minneapolis. It is bordered by Lake Harriet to the south and Lakewood Cemetery to the north. The 31-acre Sanctuary is public parkland managed by the Minneapolis Park and Recreation Board (MPRB or Park Board). In 1890, the land that is now the Sanctuary was donated to the Park Board by the Lakewood Cemetery Association. The land was designated a bird sanctuary in 1936 by the Board of Park Commissioners. In 1946, the Sanctuary was renamed to memorialize Dr. Thomas Sadler Roberts (1858-1946). The Sanctuary is a mixture of upland forest, wetland and three small dredged ponds. The ecology of the Sanctuary has been greatly altered by dredging, filling of surrounding lands, Dutch elm disease (DED), catastrophic wind damage, and invasive species. In 2010, representatives of the Audubon Chapter of Minneapolis (ACM) and the Linden Hills Neighborhood Council (LHiNC) approached the MPRB with the desire to revitalize the condition of the Sanctuary. This revitalization has three key components: developing a management plan, identifying and implementing volunteer stewardship projects, and developing educational opportunities. In August 2010, the MPRB Board of Commissioners approved a Resolution Authorizing Staff to “work with the

Audubon Chapter of Minneapolis (ACM), East Harriet-Farmstead Neighborhood Association (EHFNA), and Linden Hills Neighborhood Council (LHINC) on a Management Plan for Roberts Bird Sanctuary.” The Management Plan documents the results of a natural resources and infrastructure inventory of the area. Recommendations for management and enhancement of the Sanctuary are based on these inventories as well as the goals of the project partners and the information gathered during public meetings and surveys. In October 2012, ACM and MPRB Environmental Operations staff met with designees from ACM to develop a vision statement for the Sanctuary as well as management goals and list of needs for the Sanctuary. As part of the Management Plan, a vision statement was developed, outlining an overall Vision for the Sanctuary: The Thomas Sadler Roberts Bird Sanctuary is a public bird sanctuary treasured by visitors as a place of beauty and quiet in the urban environment, supporting a diversity of resident and migrating birds in a natural and undeveloped setting while providing environmental education opportunities to a broad audience. Three goals were developed for improving the condition of the Sanctuary:

- 1) Protect, preserve, and enhance the bird habitat and native plants contained within the Sanctuary for present and future generations of people and wildlife;
- 2) Educate and inspire people about birds and their habitats, Minnesota native plants, and the natural world; and
- 3) Provide a minimal infrastructure for the Sanctuary that honors the integrity of this undeveloped natural area as a bird sanctuary and a place that connects people with nature.

The partners in the plan have identified several needs to improve the condition of the Sanctuary:

- 1) Repair or replace the perimeter fencing;
- 2) Replace the boardwalk to include sections that are ADA compliant;
- 3) Develop educational resources for the visitor’s shelter that support the vision and goals of the Sanctuary;
- 4) Replace existing signage at both entrances to provide important notices to visitors;
- 5) Identify and implement ways to ensure uses of lands immediately adjacent to the Sanctuary boundaries complement and support the vision and goals of the Sanctuary;
- 6) Provide a trail network consistent with the Sanctuary’s vision;
- 7) Improve the ecological health of the Sanctuary’s woodland and wetland areas; and
- 8) Implement woodland and wetland enhancements based on feasibility and funding.

The Roberts Bird Sanctuary Revitalization and Management Plan seeks to incorporate the Mission of the MPRB and the four main Vision Themes from the MPRB’s Comprehensive Plan 2007-2020. The MPRB Comprehensive Plan’s vision for the future of Minneapolis’ park system is to “continue the long tradition of preserving land and connecting people to the land and to each other.” (MPRB, 2014, p. 2)

Sanctuary Location

The Sanctuary, which is located in southwest Minneapolis, includes 31 acres of public parkland owned and managed by the MPRB (Figure 1). The Sanctuary is located in the Chain of Lakes Regional Park ((MPRB, 2014).

Sanctuary History

“The Minneapolis Park System was founded in 1883. Most of the lands around Lake Harriet had been added to the park system by this time and a road had been built to encircle the lake by 1886 (Wirth, 1945, p. 118/83). In the 1890s the land that is now the Sanctuary, ‘35 acres of woodland and swamp facing Lake Harriet, on the south property line of Lakewood Cemetery’, was donated to the Board of Park Commissioners by Lakewood Cemetery Association (Wirth, 1945, p. 63)” (MPRB, 2014, p. 9).

The Sanctuary was established in 1936. Initially it was named the Bird Sanctuary in Lyndale Park (Board of Park Commissioners, 1936). The Sanctuary was renamed in 1947, at the request of the Twin City Bird Club, to the Thomas Sadler Roberts Bird Sanctuary. This action was to memorialize Dr. Roberts (1858-1946), who was a professor of ornithology and Director of the Museum of Natural History at the University of Minnesota (Board of Park Commissioners, 1947). Dr. Roberts’ two volume work, *The Birds of Minnesota*, published in 1932, was a comprehensive study of Minnesota bird life at that time (MPRB, 2014).

Several types of infrastructure were installed in the Sanctuary area over the decades both prior to and after its designation as a sanctuary. In 1918, a large sanitary sewer line was installed from west to east across what would later become the Sanctuary. This is a main sewage interceptor line that services south Minneapolis and St. Louis Park. In fall 2014 through early 2015, Metropolitan Council Environmental Services (which owns the sewer line) did major restoration work on this sewer line as part a larger project in southwest Minneapolis. Work consisted of lining the sanitary sewer interceptor and reconstruction of manhole structures (MPRB, 2014).

Perimeter fencing was installed as part of a Works Progress Administration (WPA) project in 1936. In 1958, the Minnesota Conservation Department (now Minnesota Department of Natural Resources) entered into an agreement to develop a fish spawning area near the southeastern border. A small pond was dredged, a pump building was constructed next to the pond, and a pipeline was installed under Lake Harriet Parkway to provide intake water from Lake Harriet to the pond (Board of Park Commissioners, 1960; MPRB, 2014)).

In 1987, the original pond was expanded to improve wildlife habitat. Using funding from the Legislative Commission on Minnesota Resources (LCMR), two more ponds were dredged in the early 1990s, the east sanctuary entrance was relocated, a shelter with interpretive signage was built, and a plastic boardwalk through part of the wetland area was installed (MPRB, 2014).

History of Birding in the Sanctuary

Native people had a long history in the area prior to European settlement in the 1800s (MPRB, 2014), and undoubtedly used the area around the north end Lake Harriet that is now the Sanctuary as a site for hunting birds and other wildlife. After European settlement of the Twin Cities area, Lake Harriet, the

LAKE HARRIET
BANDSHELL AND
BOAT LAUNCH

WEST ENTRY

LAKWOOD
CEMETERY
MAINTENANCE

MPRB
MAINTENANCE



Location and Base Map

STREAM

EAST LAKE
HARRIET BLVD
AND TRAILS

EAST ENTRY AND
SHELTER

ROSE
GARDENS

Figure 1

area that is now the Sanctuary, and adjacent areas also attracted bird enthusiasts beginning at least as early as the 1870s.

In Shotgun and Stethoscope The Journals of Thomas Sadler **Roberts** (Krosch, 1991), T. S. Roberts lists a number of species that he saw in “Lake Harriet woods” between the dates of June 7, 1878 (p. 115) and April 23, 1881 (p. 163). Bob Janssen, who began birding in the Sanctuary in 1947, recalls talking with Ernie D. Swedenborg, whose decades of birding in the sanctuary and vicinity overlapped both the latter decades of T. S. Roberts’ birding excursions to this same area and the early years that Bob birded in the sanctuary (personal communications with Bob Janssen, January 30 and February 6, 2016). Ernie Swedenborg told Bob that the area Roberts referred to as “Lake Harriet woods” may have been the same area on the northern shore of Lake Harriet that was subsequently designated as Lake Harriet Refuge in 1936 and as the T.S. Roberts Bird Sanctuary in 1947 (Smith 2008). Partial confirmation of this statement is provided by an 1887 map on the second to last page of T.S. Roberts’ journals, which shows that only the northern, southwestern, and southern borders of Lake Harriet remained undeveloped at that time (Krosch, 1991).

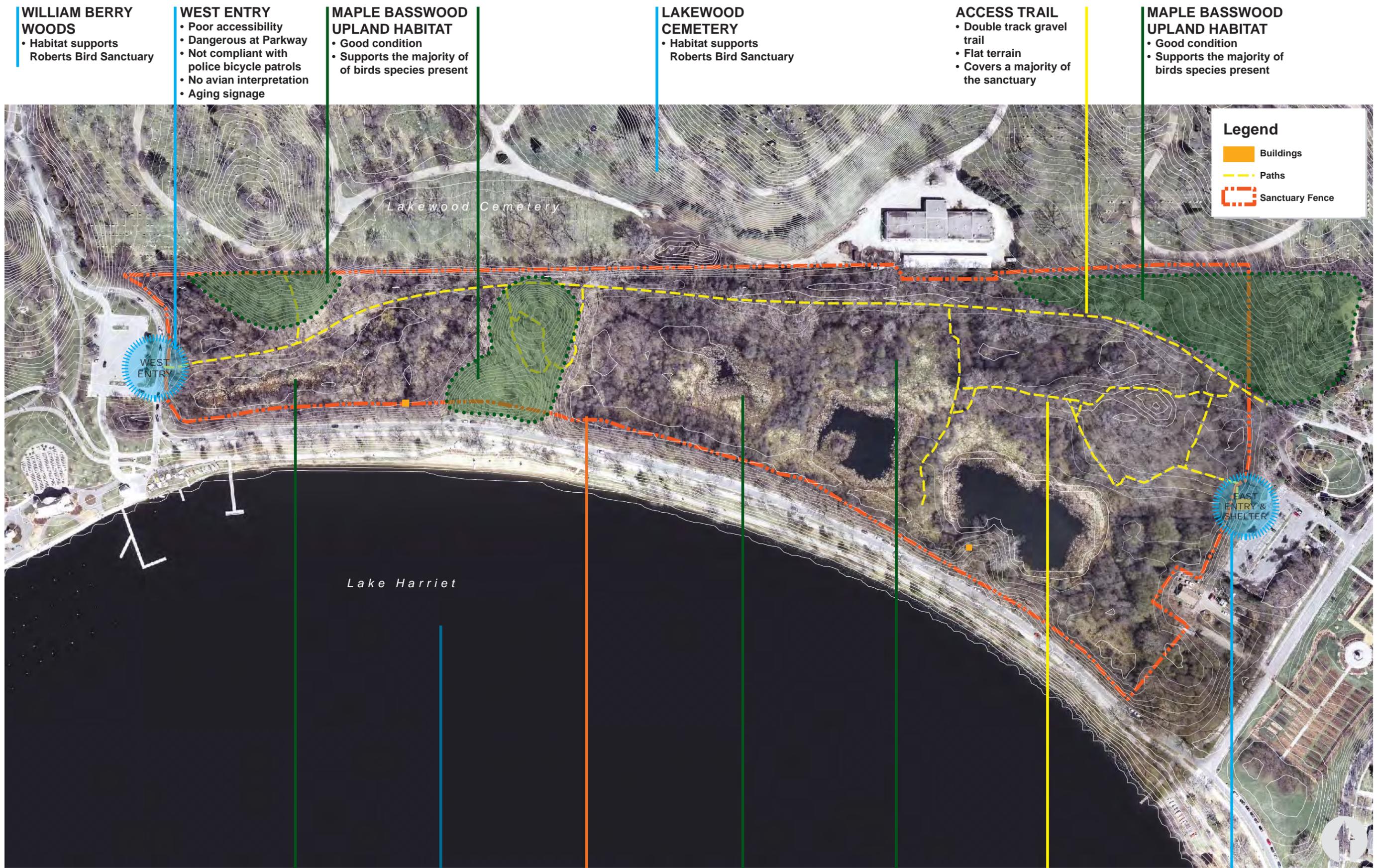
There is no doubt that T. S. Roberts birded in the area that is now the Sanctuary in his later decades. Davidson (1942) notes that Dr. Roberts’ ornithology classes enjoyed birding in the Sanctuary. A statement in Morrison, et. al. (1955) also refers to his use of the Sanctuary: “It was a favorite birding spot of the late Dr. Thomas Sadler Roberts and was named in his honor....”

Therefore, it is likely but nonetheless hypothetical that the extinct Passenger Pigeon nested in what is now the Sanctuary, that the extirpated Swallow-tailed Kite flew over the area, and that the Ruffed Grouse, now extirpated from the Chain of Lakes area, nested there. Additional records that Roberts noted in his journal from “Lake Harriet woods” include the following species recorded as nesting, with nests actually found (with two exceptions noted below):

Red-tailed Hawk, April 23, 1881 (p. 163); and on June 7, 1878 (p. 115): Least Flycatcher, Red-eyed Vireo, Gray Catbird, Ovenbird (singing, but no nest found), Yellow Warbler, Brown-headed Cowbird (one egg in Yellow Warbler nest), Orchard Oriole, and Indigo Bunting (singing, but no nest found).

In an article memorializing avid birder Ernie Swedenborg (1890-1962), it was noted that the Sanctuary was one of his favorite places to bird. The article notes that “he listed many birds in the Roberts Sanctuary, including some very unusual ones, as the Hooded, Worm-eating, Black-throated Blue and Blue-winged Warblers, and a Western Tanager. Over the years he listed more than 220 species there, the last being a Golden Eagle in April 1958. These were all seen in the sanctuary, flying over, or on Lake Harriet seen from the sanctuary. The most interesting nest in the sanctuary was that of the Pine Siskin, found in April 1961” (Mrs. E. D. Swedenborg and Robert B. Janssen, **The Loon** 35(1):6). The article also includes a quote from his notes about what he saw at the Sanctuary on May 14, 1942: “This was the day of years. Only had a chance to be in the Bridle Path about two hours in the late afternoon and probably saw more birds than I ever have. ..Thrushes and warblers were positively abundant. There must have been hundreds, probably a few thousand of them. Saw 23 species of warblers in this short time, the Magnolia being everywhere. Warblers seen included...a few hundred Ovenbirds, both Waterthrushes....” On May 12, 1965, Ernie’s wife Minnie, chief author of this article and also an avid birder, was one of four people to see the very rare Three-toed Woodpecker in the Sanctuary.

In a 1942 article, Frances Davidson described the Sanctuary as “a paradise both for birds and bird students” and stated that “204 species of birds have been positively identified in the territory” (**The Flicker** 14(4):41-42). Bob Janssen, author of multiple definitive Minnesota bird guides, began birding at



WILLIAM BERRY WOODS
 • Habitat supports Roberts Bird Sanctuary

WEST ENTRY
 • Poor accessibility
 • Dangerous at Parkway
 • Not compliant with police bicycle patrols
 • No avian interpretation
 • Aging signage

MAPLE BASSWOOD UPLAND HABITAT
 • Good condition
 • Supports the majority of birds species present

LAKWOOD CEMETERY
 • Habitat supports Roberts Bird Sanctuary

ACCESS TRAIL
 • Double track gravel trail
 • Flat terrain
 • Covers a majority of the sanctuary

MAPLE BASSWOOD UPLAND HABITAT
 • Good condition
 • Supports the majority of birds species present

Analysis and Habitats

SATURATED NON-NATIVE VEGETATION
 • Contains invasive species

LAKE HARRIET
 • Habitat supports Roberts Bird Sanctuary

PERIMETER FENCE
 • Poor shape
 • Many holes in fence
 • Does not keep deer out
 • Inaccessible in many areas

WETLANDS
 • Contains invasive species
 • Supports a variety of birds

SEMI FLOODED NON-NATIVE VEGETATION
 • Contains invasive species

BOARDWALK
 • Poor accessibility
 • Dangerous when wet
 • Poor condition
 • Ash trees overhead

EAST ENTRY
 • Poor accessibility
 • Degraded paving
 • Not compliant with police bicycle patrols
 • No avian interpretation
 • Shelter in good shape

Figure 2

the Sanctuary in 1947, sometimes birding with the Swedenborgs. Over the subsequent decades his Sanctuary list came to include such rarities as Yellow-crowned Night-Heron, Tufted Titmouse, Worm-eating Warbler, Louisiana Waterthrush, Prothonotary Warbler, and Kentucky Warbler. Another Minnesota ornithology luminary, Walter Breckinridge, saw his first Scissor-tailed Flycatcher by the sanctuary on May 10, 1983, as recounted by the person who saw it first and alerted him to its presence, Betty Murphy (**The Loon** 55(2):92). A decade earlier, Don Bolduc wrote an article entitled “Minnesota Birding Areas – T. S. Roberts Sanctuary” in which he listed 143 species he had observed there between 1960 and 1973 (**The Loon** 45(1):10-11). Some of Don’s more unusual records in or flying over the Sanctuary included Snow Goose, Virginia Rail, Black Tern, Northern Saw-whet Owl, Worm-eating Warbler, Kentucky Warbler, LeConte’s Sparrow, and Hoary Redpoll.

Two of the most active birders in the Sanctuary in recent decades include Tom Tustison and Steve Carlson. Since the 1970s Tom has observed 165 species of birds in or flying over the Sanctuary, including Redhead, Sandhill Crane, Acadian Flycatcher, Northern Shrike, Prothonotary Warbler, Savannah Sparrow, LeConte’s Sparrow, Summer Tanager, and Red Crossbill. Steve Carlson has recorded 196 species in the Sanctuary or flying over, including Snow Goose, Northern Harrier, Northern Goshawk, Rough-legged Hawk, Thayer’s Gull, Common Tern, Eastern Whip-poor-will, Western Kingbird, Common Raven, Horned Lark, Townsend’s Solitaire, Snow Bunting, Louisiana Waterthrush, Prothonotary Warbler, Cerulean Warbler, Spotted Towhee, Eastern Meadowlark, Orchard Oriole, Hoary Redpoll, and Evening Grosbeak.

Myriad other birders who have enjoyed birding in the Sanctuary over the decades, including many who have recorded their observations on e-bird in recent years (e.g., Sharon Stiteler, Peder Svingen, Bruce Fall, among numerous others). Members of the Audubon Chapter of Minneapolis and the Minneapolis Audubon Society have participated in bird walks in the Sanctuary for many decades, teaching countless aspiring birders how to identify birds and deriving great enjoyment from birding. Morrison, et. al. (1955) states the following: “The Minneapolis Audubon Society has a record of 214 species of birds reliably identified in the area during the years from 1921 to the spring of 1955.” Stephen Greenfield produced a bird list of 133 species seen in or flying over the Sanctuary, plus a list of 40 additional species seen nearby (including the very rare Sage Thrasher), as part of the 2014 planning effort on behalf of the Audubon Chapter of Minneapolis (Stephen Greenfield, personal communication, February 15, 2016).

Bird Habitat in the Sanctuary

As stated in the MPRB Management Plan (2014), “the Sanctuary is part of Minneapolis’ green corridor of urban parks, lakes, and forested natural areas....The contiguous link to other parklands provide an important corridor of forest and waterways for wildlife and migrating birds” (p. 25-26). This green and blue corridor of natural and semi-natural habitats through the center of the Minneapolis provides significant habitat for a remarkable number of bird species, especially during spring and fall migration. Because of its close proximity to the Mississippi River a few miles to the east, the Sanctuary and other MPRB park lands are part of the Mississippi River flyway, one of the four great migratory bird flyways in North America.

Although the Sanctuary is ecologically fragmented (i.e., reduced in size and separated by roads, paths, mowed lawns, buildings, and other human infrastructure from other tracts of park land and natural areas in Hennepin County), it is nonetheless strategically located between Lake Harriet on the south, the relatively high quality William Berry woods ¼ mile to the west, Lake Calhoun about ½ mile to the northwest, the 250 acre semi-natural Lakewood Cemetery on the north, and other MPRB park land on

the east. The Sanctuary provides uniquely important habitat both because of its strategic location and because it is the largest, most diverse tract of woods and marsh in this diverse habitat mosaic.

The Sanctuary includes two general habitat types: wetland and forest. Each of these general habitat types can be further subdivided into two types of wetlands and two types of forest as described in the next two sections.

Wetlands

Minneapolis' landscape prior to European settlement was a mosaic of forests, prairie, oak savanna, wetlands, lakes, and streams. Several publications assert that the Sanctuary's wetland was a tamarack bog at one time (Davidson, 1942; MRPB, 1993), but it is hard to determine if this was the case because of the significant dredging, grading, and filling of the wetland that has occurred in the past 125 years (MRPB, 2014).

Davidson (1942) describes the wetland as it was 74 years ago:

“Between the [main east-west] trail and Lake Harriet a once-on-a-time tamarack swamp has now become an open marsh whose “marshiness” depends upon the annual rainfall. It is overgrown with wild flowers and dotted with clumps of willow, alder, dogwood, and elderberry bushes, some of them almost choked by woodbine, wild grape, and wild cucumber vines. A few little streamlets meander through the marsh and it clasps to its bosom one or two shallow, half-stagnant pools of water bordered by cattails....”

The Sanctuary's wetland currently is designated by the Minnesota DNR as a water of the State (public water number 27-665p) (MPRB, 2014). The U.S. Fish and Wildlife Service's National Wetlands Inventory, which is based on aerial photography from 1980, identifies a large portion of the Sanctuary as wetland (see Figure 36 in the MPRB Sanctuary management plan, 2014). About “17 acres of the site were identified as a freshwater wetland and seasonally flooded wetland dominated by scrub-shrub and broad-leaved deciduous vegetation with areas of emergent herbaceous wetland vegetation and a hydrologic regime that has been altered by ditching....Two acres of the site were identified as a freshwater wetland that is seasonally flooded and forested with broad-leaved deciduous trees” (MPRB, 2014, p. 32).

The 2014 MPRB Management Plan identifies four current habitat types in the Sanctuary, two of which are wetland habitat types. These habitat types were identified using the Minnesota Land Cover Classification System (MLCCS). This system “is a MN DNR classification system that integrates cultural features as well as natural, semi-natural, and non-native vegetation into a comprehensive habitat classification system.” (MPRB, 2014) This hierarchical classification system assigns numbers to each land cover type based on vegetation cover and impervious surfaces in an area. The MLCCS is a useful technical tool for developing natural resource management plans and assessing ecological site quality.

“MLCCS Classification #61480 – Saturated altered/nonnative graminoid vegetation. *A wetland on saturated soils with <30% tree cover and <50% shrub cover that's dominated by non-native species, especially reed canary grass. This type also includes monotypic cattail stands with few (or no) other species.*

Discussion: The dominant plant species of this area is reed canary grass. Purple loosestrife is also found in this area. Water in this area comes from the Lakewood Cemetery pond and storm water and outflows from the Cemetery. This water moves through the Sanctuary as an ephemeral stream that enters Lake

Harriet through a submerged pipe at the west end of the beach. Standing water was observed from September 2010 through May 2011 due to significant rain and snowfall.” (MPRB, 2014, p. 39-40)

“MLCCS Classification #61630 – Semi-permanently flooded altered/non-native dominated vegetation. *Wetland on semi-permanently flooded soils with < 30% tree cover and <50% shrub cover that is dominated by non-native species such as purple loosestrife. Type also includes monotypic cattail stands.*

Discussion: This vegetation type comprises almost half of the Sanctuary. Late September 2010 experienced heavy rainfall amounts: in one four-day period rainfall totaled 3.5 inches. At the time of the vegetation survey there was standing water in this area. Heavy snowfall during the winter of 2010-2011 maintained high water levels. Standing water was observed in this area until May 2011. Reed canary grass comprises over 90 percent of the vegetation in this area, and Canada thistle is intermixed with the reed canary grass. Hybrid cattails encircle the open water areas. Glossy buckthorn, willow, and dogwood occurred in this area after the 1981 tornado. Tamaracks noted in the plant inventory are from volunteer planting events in 1988 and 2003.” (MPRB, 2014, p. 40)

Forests

Bolduc (1973) provides a list of some of trees present in the forested areas of the Sanctuary in 1973: “American Elm, Sugar Maple, Silver Maple, Northern Red Oak, Basswood, Black Cherry, Black Willow, Box Elder, Hackberry, Burr Oak, Cottonwood, White Ash, Mulberry and Tamarac. A few of the shrubs present are: Prickly Ash, Buckthorn, Frost Grape, Riverbank Grape, Alternate Leaf Dogwood and Pin Cherry. In addition many wildflowers and mushrooms are found when in season.”

A publication by the Minneapolis Park and Recreation Board (1993) provides additional information on the Sanctuary’s forest habitat: “A tornado destroyed what remained of the tamarack in 1925. American elms replaced them in the wet soils. Many of the elms died of Dutch elm disease and many of the rest were felled by a windstorm in 1979 and a tornado in 1981. The drier west end of the site remains a hardwood forest. A European shrub, the common buckthorn, filled the spots left vacant by the trees.” (MPRB, 1993, p. 27)

An analysis of the trees in the Sanctuary prior to development of the 2014 management plan “found that the entire Sanctuary has an average 75.8 percent tree cover. Canopy cover is not contiguous throughout the Sanctuary as the wetland and open water areas do not have trees in abundance....Of the trees in the Sanctuary, 75.6 percent have DBH (diameters at breast height) less than 6 inches....Glossy buckthorn is the most common species in the Sanctuary (22.3 percent). Green ash comprises 17.1 percent and Boxelder 12.7 percent of the tree cover.” (MPRB, p. 24)

The 2014 MPRB Management Plan (2014) identifies two current forest habitat types in the Sanctuary:

“MLCCS Classification #32150 – Maple Basswood Forest. *An upland forest where sugar maples, basswoods, and elms dominate the canopy or where they dominate along with oaks (with <60% oak cover).*

Discussion: While the MLCCS categorizes this area as a maple basswood forest, the majority of trees found in this area are the fast-growing opportunistic trees that come in after a disturbance in the tree canopy (box elder, green ash, cottonwood). An “altered/non-native deciduous forest” (MLCCS #32170) would be a more accurate description of the current plant community:

Boxelder, green ash, and cottonwood are typical canopy dominants, sometimes together and sometimes singly. Elms are common associates. Hackberries, aspens, oaks, and basswoods may also be present. The shrub layer is often dominated by buckthorn and Tartarian honeysuckle, but gooseberries and elderberries can also be common. The ground layer is also dominated by species tolerant of disturbances, including white snakeroot, motherwort, and garlic mustard.

This area illustrates the great vegetation change that came about from Dutch Elm Disease (DED) losses in the 1970s and the 1981 tornado. The species composition of ash, box elder, and hackberry illustrate how these opportunistic tree species quickly establish themselves in the forest canopy openings made by storm events. These trees now have completely matured and make for a completely closed canopy.” (MPRB, 2014, p. 38)

Sugar maple, basswood, and white and red oaks “over 20 inches DBH (diameter at breast height are present as scattered trees throughout this plant community. These large trees are most likely remnants from the oak-maple-basswood forest types that were historically found in this area and throughout the City prior to European settlement. While this plant community has been altered by DED and windstorms, this upland forest area is the best representation of the historic woodland vegetation of the Sanctuary and could be considered a remnant plant community in the context of the Sanctuary. Sugar maples are successfully regenerating on the hilly upland area in the western section of the Sanctuary. The oaks are not regenerating as well as the sugar maple due to the dense shade of canopy trees and invasive shrubs. The shrub layer in this area has the common invasive species found in most Minneapolis woodlands including: common buckthorn, glossy buckthorn, Tatarian honeysuckle, white mulberry, and Norway maple. There are native shrubs found in this area, most notably the red berried elder. Native herbaceous species are few in the Sanctuary. Desirable herbaceous species such as large-flowered bellwort, early meadow rue, and spikenard are found in this plant community.” (MPRB, 2014, p. 39)

“MLCCS Classification #32220 – Lowland hardwood forest. *Greater than 30% tree cover. Growing just above an active floodplain...or at the upper edge of a wetland basin. More than two tree species and diverse understory vegetation. Mineral soils rather than peat.*

Discussion: This area forms the edge of the wetland area and is dominated by green ash, boxelder, willow and cottonwood. Silver maple and American elm are also present. Tamarack trees were planted into the area in 1988 and again in 2003 by MPRB staff and volunteers. The shrub layer is predominantly glossy buckthorn with common buckthorn and white mulberry as well. Many of the glossy buckthorn are multi-stemmed shrubs. Herbaceous plants, grasses and sedges are sparse and patchy in this area. Jewelweed, an annual native plant, occurs in large patches.” (MPRB, 2014, p. 39)

Sanctuary Designations as Bird Habitat

National Audubon Society’s Important Bird Area Designation

“Realizing the important role Minneapolis’ parkland corridor provides for bird life, representatives from Minneapolis’ Audubon Society and ACM [the Audubon Chapter of Minneapolis], with approval and support of the MPRB, applied for and obtained National Audubon Society’s Important Bird Area (IBA) designation in 2009....The IBA program is a global initiative that seeks to “identify and conserve areas that are vital to birds and other biodiversity.” (MPRB, 2014, p. 26)

U.S. Fish and Wildlife Service's Urban Migratory Bird Treaty

"The U. S. Fish and Wildlife Service declared in July 2011 that the City of Minneapolis, the MPRB, the City of Saint Paul, and Audubon Minnesota were successful in their application to be part of the Urban Migratory Bird Treaty (UMBT) program. A major goal of the program is to raise awareness and improve the condition for birds as they are migrating through urban areas. The focus area for Minneapolis and Saint Paul's UMBT is the Mississippi River corridor. Principles of this bird treaty align with the goals of the Sanctuary's Management Plan goals and include enhancing bird habitat by removing invasive species and planting native species, and providing educational information on bird conservation in urban areas." (MPRB, 2014, p. 26)

Birds of the Sanctuary

Table 1 includes a list of 220 species that have been observed flying in or over the Sanctuary. Two hybrids (Brewster's Warbler and Lawrence's Warbler) and three additional extinct or extirpated species that T. S. Roberts likely observed in the area that is now the Sanctuary are also noted on the list (Passenger Pigeon, Swallow-tailed Kite, and Ruffed Grouse). The list is probably incomplete, as so many people have birded in the Sanctuary over so many decades that there are undoubtedly additional species that credible observers have documented there.

Table 1. Birds of the T. S. Roberts Bird Sanctuary (DRAFT – February 18, 2016)

Seasonal, Nesting, and Abundance Status Codes

The ***seasons and nesting status*** in the list are defined as follows:

W = winter resident or visitor (December - February)	N = nests
Sp = spring migrant or resident (March – May)	PN = probably nests
Su = summer resident or visitor (June - July)	UN = used to nest
Fa = fall migrant or resident (August - November)	

Abundance codes are defined as follows:

C = Common – usually present, relatively easy to find
U = Uncommon – usually present, but may be difficult to find
O = Occasional – observed three or more times, but often or usually not present
R = Rare - observed only once or twice (see Notes below)

Habitat Preference codes are defined as follows:

F = Flying Overhead – observed only or mostly flying over the sanctuary
For = Upland Forest and/or Lowland Forest
M = Marsh and/or small ponds in sanctuary
Field is listed for a few species, even though there is no field habitat in the sanctuary

Federal and State Listed Species and Species in Greatest Conservation Need codes follow:

No bird species on the Federal Endangered or Threatened Species lists occurs in the sanctuary. State Endangered, Threatened, and Special Concern Species codes and Species in Greatest Conservation Need are indicated by the codes listed below.

E = State Endangered: Species is threatened with extinction throughout all or a significant portion of its range within Minnesota.

T = State Threatened: Species is likely to become endangered within the foreseeable future

throughout all or a significant portion of its range within Minnesota).

SC = State Special Concern: Species is extremely uncommon in Minnesota, or has unique or highly specific habitat requirements and deserves careful monitoring of its status. Species on the periphery of their range that are not listed as threatened may be included in this category along with those species that were once threatened or endangered but now having increasing or protected, stable populations.

G = Species in Greatest Conservation Need are animal species whose populations are rare, declining, or vulnerable in Minnesota and meet one or more of the following criteria:

- Species whose populations are identified as being rare, declining, or vulnerable in Minnesota;
- Species at risk because they depend upon rare, declining, or vulnerable habitats;
- Species subject to other specific threats that make them vulnerable (e.g., over-exploitation, invasive species, disease, contaminants, lack of citizen understanding and stewardship);
- Species with certain characteristics that make them vulnerable (e.g., require large home ranges/use multiple habitats, depend upon large habitat patch sizes, need special resources, depend upon an ecological process (such as fire) that no longer operates with the natural range of variation; are limited in their ability to recover on their own due to low dispersal ability or low reproductive rate; or have a highly localized or restricted distribution [endemics]);
- Species whose Minnesota populations are stable, but are declining in a substantial part of their range outside of Minnesota (such as Common Loon or Black Tern).

<u>Species</u>	<u>W</u>	<u>Sp</u>	<u>Su</u>	<u>Fa</u>	<u>Habitat</u>	<u>Status</u>
Snow Goose		RF			F	
Canada Goose		C		C	F, M	
Tundra Swan		UF		UF	F	
Wood Duck		C	C	C	M	N
Gadwall		OF		R	F, M	
American Black Duck		O			M	G
Mallard	C	C	C	C	M	PN
Blue-winged Teal		U		R	M	
Northern Shoveler		R			M, F	
Green-winged Teal		R			M	
Northern Pintail				RF	F	G
Redhead		R			M	
Ring-necked Duck		R?			M	
Lesser Scaup		OF			F	G
Common Goldeneye	RF				F	
Bufflehead		UF			F	
Hooded Merganser		U	O		M	
Common Merganser		RF			F	
Red-breasted Merganser		UF		RF	F	
Ring-necked Pheasant						For, M, Field, Extirpated
Wild Turkey	C	C	C	C	For	
Common Loon		UF		RF	F	G
Pied-billed Grebe				R	M	
Double-crested Cormorant		UF		RF	F	
American White Pelican		OF		UF	F	SC
American Bittern		R			M	G
Great Blue Heron		C	O	O	F, M	

<u>Species</u>	<u>W</u>	<u>Sp</u>	<u>Su</u>	<u>Fa</u>	<u>Habitat</u>	<u>Status</u>
Great Egret		U	O		F, M	
Green Heron		U			M	UN
Black-crowned Night-Heron		U			M	G
Yellow-crowned Night-Heron		R			M	
Turkey Vulture		UF			F	
Osprey			OF	OF	F	
Bald Eagle	OF	UF		CF	F, For	
Northern Harrier				RF	F	G
Sharp-shinned Hawk		UF		UF	F, For	
Cooper's Hawk		U	U	UF	For, F	PN; increasing
Northern Goshawk	R				For	SC
Red-shouldered Hawk		RF			F, For	SC
Broad-winged Hawk		UF		UF	F, For	
Red-tailed Hawk	O	UF		OF	F, For	UN (N 1878?)
Rough-legged Hawk				RF	F	
Golden Eagle		RF			F	
Virginia Rail		O			M	
Sora		U		R	M	
American Coot		U			M	
Sandhill Crane		RF			F	
Killdeer		OF			F	N in Peace Garden
Spotted Sandpiper		R			M	
Solitary Sandpiper		O		R	M	
Greater Yellowlegs				RF	F	
Lesser Yellowlegs		OF			F	
Wilson's Snipe		R		R	M	
American Woodcock		O			For	G
Bonaparte's Gull		RF?			F	
Franklin's Gull				UF	F	SC
Ring-billed Gull		CF	CF	CF	F	
Herring Gull		OF			F	
Thayer's Gull	RF				F	
Caspian Tern		RF		OF	F	
Black Tern		RF?			F	
Common Tern				R?	F	T
Forster's Tern		OF		RF	F	SC
Rock Pigeon	U	U		U	For	
Mourning Dove		C	C	O	For	PN
Yellow-billed Cuckoo		O			For	G, UN
Black-billed Cuckoo		O		O	For	G, UN
Eastern Screech-Owl		O		R	For	PN
Great Horned Owl	C	C	C	C	For	N 2015
Barred Owl		U		O	For	PN
Great Gray Owl		R			For	
Long-eared Owl		R		R	For	
Northern Saw-whet Owl		R			For	
Common Nighthawk		UF	UF	RF	F	G

<u>Species</u>	<u>W</u>	<u>Sp</u>	<u>Su</u>	<u>Fa</u>	<u>Habitat</u>	<u>Status</u>
Eastern Whip-poor-will		O		R	For	G
Chimney Swift		UF	CF	UF	F	G
Ruby-throated Hummingbird		U	O	C	For	
Belted Kingfisher		U		O	M	G
Red-headed Woodpecker		O		R	For	G, UN
Red-bellied Woodpecker	U	U	U	U	For	N
Yellow-bellied Sapsucker		U		U	For	
Downy Woodpecker	C	C	C	C	For	PN
Hairy Woodpecker	C	C	C	C	For	PN
Three-toed Woodpecker		R			For	
Northern Flicker	U	C	O	C	For	Decreasing
Pileated Woodpecker	U	U	O	U	For	Decreasing
American Kestrel				RF	F, For edge	G
Merlin		RF		OF	F, For	
Peregrine Falcon		OF		RF	F	SC
Olive-sided Flycatcher		U		U	For	G
Eastern Wood-Pewee		U	C	U	For	PN
Yellow-bellied Flycatcher		O	R	O	For	
Acadian Flycatcher		R	R		For	SC
Alder Flycatcher		U	O		M	UN
Willow Flycatcher		R		R	M	
Least Flycatcher		U	O	U	For	UN (N 1878?)
Eastern Phoebe		C	U	O	For	PN
Great Crested Flycatcher		C	C	U	For	PN
Western Kingbird		R		R	For edge	G
Eastern Kingbird		O		O	For edge	
Scissor-tailed Flycatcher		R			For edge	
Northern Shrike	R				For edge, M	
Bell's Vireo		R?			For edge	SC
Yellow-throated Vireo		U	O	U	For	UN
Blue-headed Vireo		U		U	For	
Warbling Vireo		C	C	U	For	PN
Philadelphia Vireo		O		U	For	G
Red-eyed Vireo		C	C	C	For	PN
Blue Jay	C	C	C	C	For	PN
American Crow	C	C	O	C	For	PN
Common Raven				RF	F	
Horned Lark	RF				F	
Purple Martin		UF			F	SC
Tree Swallow		UF	OF		F, M	PN
Northern Rough-winged Swallow		OF			F	G
Cliff Swallow		OF			F	
Barn Swallow		UF	UF	UF	F	
Black-capped Chickadee	C	C	C	C	For	PN
Tufted Titmouse		(O)	(R)	(R)	For	(last rec 1972)
Red-breasted Nuthatch		O	O	U	For	
White-breasted Nuthatch	C	C	C	C	For	PN

<u>Species</u>	<u>W</u>	<u>Sp</u>	<u>Su</u>	<u>Fa</u>	<u>Habitat</u>	<u>Status</u>
Brown Creeper	U	C		C	For	
House Wren		C	U	U	For	PN
Winter Wren		U		U	For	G
Sedge Wren		O		O	M	G
Marsh Wren		O		R	M	
Carolina Wren		R			For	
Bewick's Wren					For edge	Extirpated?
Blue-gray Gnatcatcher		U	O	O	For	
Golden-crowned Kinglet		C		C	For	
Ruby-crowned Kinglet	R	C		C	For	
Eastern Bluebird		U		O	For edge	
Townsend's Solitaire	R				For	
Veery		U		O	For	G
Gray-cheeked Thrush		U	R	O	For	
Swainson's Thrush		C		C	For	
Hermit Thrush	R	C		C	For	
Wood Thrush		U		R	For	UN; G
American Robin	C	C	C	C	For	N 2015
Gray Catbird		C	C	C	For edge	PN
Brown Thrasher	R	U		U	For edge	G, declining
European Starling	C	U	C	O	For	PN
American Pipit		RF		RF	F	
Bohemian Waxwing	O	O			For	(last rec 1987)
Cedar Waxwing	O	U	U	C	For	
Snow Bunting				RF	F	
Ovenbird		C	O	C	For	UN (N 1878?)
Worm-eating Warbler		O			For	
Louisiana Waterthrush		R		R	For	SC
Northern Waterthrush		C		U	For	
Golden-winged Warbler		U		U	For	G
Blue-winged Warbler		O		R	For	
[Brewster's Warbler (hybrid		R			For]	
[Lawrence's Warbler (hybrid)				R	For]	
Black-and-White Warbler		C		C	For	
Prothonotary Warbler		R		R	For	G
Tennessee Warbler		C		C	For	
Orange-crowned Warbler		C		U	For	
Nashville Warbler		C		C	For	
Connecticut Warbler		O			For	G, declining
Mourning Warbler		U		U	For	
Kentucky Warbler		O			For	
Common Yellowthroat		C	C	U	M, For edge	PN
Hooded Warbler		O		O	For	SC
American Redstart		C	O	C	For	
Cape May Warbler		O		O	For	G
Cerulean Warbler		R			For	SC

<u>Species</u>	<u>W</u>	<u>Sp</u>	<u>Su</u>	<u>Fa</u>	<u>Habitat</u>	<u>Status</u>
Northern Parula		O		U	For	
Magnolia Warbler		C		C	For	
Bay-breasted Warbler		R		U	For	G
Blackburnian Warbler		O		U	For	
Yellow Warbler		C	U	C	For, M	PN
Chestnut-sided Warbler		C		C	For edge	
Black-throated Blue Warbler		R		O	For	G
Palm Warbler		U		O	M, For	
Pine Warbler		R		R	For	
Yellow-rumped Warbler		C		C	For, M	
Black-throated Green Warbler		O		U	For	
Canada Warbler		U		C	For	
Wilson's Warbler		U		U	For	
Spotted Towhee				R	For	
Eastern Towhee		O			For	G
American Tree Sparrow	O	U		O	For edge, M	
Chipping Sparrow		U	O	U	For edge	PN
Clay-colored Sparrow		O		R	For edge	
Field Sparrow		O		R	Field, edge	G
Vesper Sparrow		R			Field, edge	
Savannah Sparrow		R			Field, M	
Le Conte's Sparrow				R	M, field G	
Fox Sparrow		C		C	For	
Song Sparrow	R	C	C	C	M, For edge	PN
Lincoln's Sparrow		U		U	For edge, M	
Swamp Sparrow		U		U	M, For edge	PN
White-throated Sparrow	O	C		C	For edge	
Harris' Sparrow		U		O	For edge	
White-crowned Sparrow		U		U	For edge, field	
Dark-eyed Junco	C	C		C	For	
Summer Tanager		R			For	
Scarlet Tanager		O		U	For	
Western Tanager		R			For	
Northern Cardinal	C	C	C	C	For edge	PN
Rose-breasted Grosbeak		U	O	C	For	UN; PN
Indigo Bunting		O	O	R	For edge	PN
Red-winged Blackbird		C	C	O	M, For edge	PN
Eastern Meadowlark		R			Field, MG	
Yellow-headed Blackbird		O	R		M	
Rusty Blackbird		U		O	For, M	
Common Grackle		C	C		For edge	PN
Brown-headed Cowbird		U	U	O	For, M	PN
Orchard Oriole		R	(R)		For edge	UN (N 1878?)
Baltimore Oriole		C	C	U	For edge	N 2015
House Finch	O	U	U	R	For edge	PN
Purple Finch	O	R		O	For	G
Red Crossbill	R	O			For	

<u>Species</u>	<u>W</u>	<u>Sp</u>	<u>Su</u>	<u>Fa</u>	<u>Habitat</u>	<u>Status</u>
White-winged Crossbill				R	For	
Common Redpoll	O	R		R	Field, For edge	
Hoary Redpoll	R				Field, For edge	
Pine Siskin	O	U		O	For	UN (N 1961)
American Goldfinch	C	C	C	C	For edge	PN
Evening Grosbeak				R	F	G
House Sparrow	C	C	C	C	For edge	PN

Hypothetical Records for Extinct and Extirpated Species*

<u>Species</u>	<u>W</u>	<u>Sp</u>	<u>Su</u>	<u>F</u>	<u>Notes for Rare Species</u>
Ruffed Grouse (extirpated)				x	6/7/1878, T.S. Roberts, "covey with young 2-3 days old."
Swallow-tailed Kite (extirpated)		x			5/9/1879, T.S. Roberts, "saw 3 flying over."
Passenger Pigeon (extinct)			x		5/9/1879, per T.S. Roberts, "nest with one egg."

* In "Shotgun and Stethoscope The Journals of Thomas Sadler Roberts" (1991), T.S. Roberts lists a number of species that he saw in "Lake Harriet woods" between the dates of June 7, 1878 (p. 115) and April 23, 1881 (p. 163). Bob Janssen, who began birding in T.S. Roberts Sanctuary in 1947, recalls talking with E.D. Swedenborg, whose decades of birding in the sanctuary and vicinity overlapped both the latter decades of T.S. Roberts' birding excursions to this same area and the early years that Bob birded in the sanctuary (personal communications, January 30 and February 6, 2016). E.D. Swedenborg told Bob that the area Roberts referred to as "Lake Harriet woods" may have been the same area on the northern shore of Lake Harriet that was subsequently designated as Lake Harriet Refuge in 1936 and in 1947 the T.S. Roberts Bird Sanctuary (Smith 2008). Partial confirmation of this statement is provided by an 1887 map on the second to last page of T.S. Roberts' journals, which shows that only the northern, southwestern, and southern borders of Lake Harriet remained undeveloped at that time. Therefore, it is likely but nonetheless hypothetical that the extinct Passenger Pigeon nested in what is now the sanctuary, that the extirpated Swallow-tailed Kite occurred there, and that the Ruffed Grouse, now extirpated from the Chain of Lakes area, nested there. Additional records that Roberts noted in his journal from "Lake Harriet woods" include the following species recorded as nesting, with nests actually found (with two exceptions noted below):

Red-tailed Hawk, April 23, 1881 (p. 163), and the following nesting records (with two exceptions noted) on June 7, 1878 (p. 115): Least Flycatcher, Red-eyed Vireo, Gray Catbird, Ovenbird (singing, but no nest found), Yellow Warbler, Brown-headed Cowbird (one egg in Yellow Warbler nest), Orchard Oriole, and Indigo Bunting (singing, but no nest found).

Total List = 220 species + 2 hybrids + 3 hypothetical records for extinct or extirpated species

Sources of Records

e-bird on line records, all observers.*

Krosch, Penelope. 1991. Shotgun and Stethoscope The Journals of Thomas Sadler Roberts.

Printed and distributed by James Ford Bell Museum of natural History, University Of Minnesota, Minneapolis.

Minnesota Ornithologists Union (MOU) on line records and personal records for Steve Carlson.

MOU on line records and personal records for Bob Janssen.

MOU on line records for Tom Tustison.

MOU on line and personal records for Dave Zumeta.

MOU on line records for a number of other observers from the late 1920s through 2016.

Morrison, Kenneth D., W. J. Breckinridge and Josephine Daneman Herz. 1955. Where to Find Birds in Minnesota. University of Minnesota Press, Minneapolis, Minnesota.

Personal communication with Jerry Bahls, President, Audubon Chapter of Minneapolis, February 16, 2016.

Personal communication with Stephen Greenfield, February 15, 2016.

Personal communications with Bob Janssen, January 30 and February 6, 2016.

* A few e-bird records, especially those for several species of ducks and other water birds, may be from Lake Harriet rather than from within the borders of T. S. Roberts Bird Sanctuary. Therefore, seasonal abundance has been reduced modestly for these species. A few species the presence of which during a given season of the year is highly unlikely or requires further verification (e.g., Horned Grebe flying over the Sanctuary; Franklin's Gull flying over the Sanctuary in spring; Brewer's Blackbird, which is easily confused with Rusty Blackbird) were not included in the list. In addition, the non-e-bird observations of several observers as noted above have been incorporated in with the e-bird records to develop this list. As a result, this list differs somewhat in occurrence and seasonal abundance from the list for the sanctuary that can be derived directly from e-bird.

Seasonal Occurrence of Birds in the Sanctuary

One hundred ninety-seven species (90 percent) occur or formerly occurred as either spring migrants or residents. One hundred fifty-seven species (71 percent) occur or formerly occurred as either fall migrants or residents. Because of its relatively small size, the Sanctuary does not support a large number of breeding species, and therefore the list of summer residents or visitors is considerably shorter than the lists during spring and fall migration (62 species; 28 percent of the total number of species recorded in the Sanctuary). Given the Twin Cities' relatively long, severe winters, it is not surprising that the smallest number of species (42) compared to other seasons have been seen in winter (December through February) (19 percent of the total number of species recorded in the Sanctuary).

Bird Occurrence by Habitat

The bird list includes general habitat preferences for each species. The three general habitat categories included on the list are **forest, marsh (wetland)**, or seen entirely or mostly **flying overhead**. The habitat category **field** is listed for a few species, even though there is no field habitat in the sanctuary.

Although forest habitat makes up only about half of the Sanctuary's area, almost two-thirds of the species recorded in the sanctuary (66 percent) are species that are completely or partly dependent on forest habitats. Forest is a broad habitat category, including upland forest, lowland forest, forested wetland, and forest edge. The 145 species in this category include mainly hawks, owls, woodpeckers, flycatchers, vireos, nuthatches, wrens, kinglets, thrushes, waxwings, warblers, some sparrows, tanagers, orioles, and finches.

Fifty-five species (25 percent) are observed only or mostly in flight over the Sanctuary. Many of these species are water birds (e.g., swans, geese, ducks, gulls, terns, sandpipers) that were observed either

flying between Lake Harriet to the south and Lake Calhoun to the northwest or else migrating over the Sanctuary. Most of the remaining species in this category are hawks, eagles, swifts, or swallows.

Forty-seven species (21 percent) of the species observed in the Sanctuary are completely or partly dependent on wetland habitats, which include marsh, shrub wetlands, and small ponds in the Sanctuary. It is important to note that a number of the species observed only or mostly in flight over the Sanctuary are also associated with wetland, pond, or lake habitats, but never or rarely use the Sanctuary wetlands and ponds because of their limited extent or because the open water of Lake Harriet is their preferred habitat. Some other species observed only or mostly in flight are also associated with forest habitats.

One of the preferred habitats of eight species is listed as field, even though there is no field habitat in the Sanctuary. A majority of these species are sparrows that are rare in the Sanctuary.

Several species that used to occur regularly in the Sanctuary no longer do so, or occur more rarely than in previous decades, either because of changes in habitat or declining numbers across part or all of the species' geographic range. These species include Ring-necked Pheasant, Purple Martin, Bewick's Wren, Tufted Titmouse, and Bohemian Waxwing. The latter three species likely were always of rare or irregular occurrence in the Sanctuary. Four other species, although they still occur regularly, are declining in numbers or frequency of occurrence in the Sanctuary: Northern Flicker, Pileated Woodpecker, Brown Thrasher, and Connecticut Warbler. Cooper's Hawks are increasing in numbers.

At least 52 species breed, have bred, or likely formerly bred in the Sanctuary. Of these, 38 species (17 percent of the species that have occurred in the Sanctuary) definitely or probably still breed there. Species that used to breed or probably bred in the Sanctuary but no longer do so include Green Heron; Yellow-billed Cuckoo; Black-billed Cuckoo; Red-headed Woodpecker; Alder Flycatcher; Yellow-throated Vireo; Wood Thrush; Pine Siskin (1961); and perhaps Ruffed Grouse, Red-tailed Hawk, Passenger Pigeon, Least Flycatcher, Ovenbird, and Orchard Oriole in the late 1800s. Additional information about some of these species that have declined in frequency or extent of occurrence is provided in the next section.

Federal and State Listed Species and Species of Greatest Conservation Need

Federal and State Endangered and Threatened Species¹

None of the bird species on the federal list of endangered and threatened species list have ever been recorded in the Sanctuary. One state-listed endangered species,² the Horned Grebe, is a common spring and fall migrant in the Twin Cities area that occurs in considerable abundance on Lake Harriet, especially on the north end of the lake. The Horned Grebe does not nest in southern or central Minnesota. This species probably has never occurred in the Sanctuary itself, however, as its preferred habitat in migration is water bodies that are larger and deeper than those present there. Horned Grebes undoubtedly fly over the Sanctuary in both spring and fall migration, but there are no documented records of a Horned Grebe doing so, as they apparently migrate at night and are challenging to identify definitively when in flight.

¹ Minnesota Department of Natural Resources, 2016.

² A **state endangered species** is a species that is threatened with extinction throughout all or a significant portion of its range within Minnesota.

One state-listed threatened species³, the Common Tern, has been observed flying over the Sanctuary on at least one occasion. There is, however, no suitable habitat for this species in the Sanctuary, which prefers large water bodies and sand beaches. The Common Tern does not nest in southern or central Minnesota.

State Special Concern Species⁴

Twelve species that have been designated by the State of Minnesota as species of Special Concern have been recorded in or flying over the Sanctuary. Of these, six species have been recorded only in flight over the Sanctuary during spring or fall migration, as follows:

American White Pelican: Occasional spring and uncommon fall migrant.

Red-shouldered Hawk: Rare spring migrant (one definite record).

Franklin's Gull: Probably absent in spring and an uncommon fall migrant.

Forster's Tern: Occasional spring migrant and rare fall migrant.

Peregrine Falcon: Occasional spring migrant and rare fall migrant.

Purple Martin: Uncommon spring migrant.

There is no suitable breeding habitat in the Sanctuary for any of these species, although the Purple Martin could potentially breed nearby in a nearby open location like the Rose Garden if a suitable nesting box was erected and maintained. The Sanctuary, although too heavily wooded to attract nesting Purple Martins even if a nest box were erected in the wetland, would provide aerial insects that the breeding martins would use for food and for feeding nestlings. If there is interest in the part of the MPRB in pursuing this possibility, Bob Janssen (personal communication) suggested that the MPRB contact two experts on Purple Martin nesting ecology: Kelly Applegate of the Mille Lacs tribe, and Tony Lau, who resides in Otsego. Rich Baker, Endangered Species Coordinator for the Minnesota DNR, has contact information for these two individuals.

Four of the six remaining Special Concern species are rare migrants (one also occurred as a summer visitor), and one species is a rare winter visitor, as follows:

Northern Goshawk: Rare winter visitor (one record).

Acadian Flycatcher: Rare spring migrant, rare summer visitor (one record in each season).

Bell's Vireo: One probable record, but the date is uncertain.

Louisiana Waterthrush: Rare spring migrant (two records) and rare fall migrant (one record).

Cerulean Warbler: Rare spring migrant (two records).

It is highly unlikely that any of these species would breed in the Sanctuary, as their preferred breeding habitat is not present.

³ A **state threatened species** is a species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range within Minnesota.

⁴ A **state special concern species** is a species that is extremely uncommon in Minnesota, or has unique or highly specific habitat requirements and deserves careful monitoring of its status. Species on the periphery of their range that are not listed as threatened may be included in this category along with those species that were once threatened or endangered but now have increasing or protected, stable populations.

The final species deserves special mention, as the first authentic Minnesota record for this species occurred in the Sanctuary on May 17, 1942 (**The Flicker** 14(4):41-43):

Hooded Warbler: Occasional spring migrant and occasional fall migrant. This rare species occurs more often in the Sanctuary than it does in most other Minnesota locations. The only location in Minnesota where this species is known to breed regularly is Murphy Hanrehan Regional Park in Scott County, where it prefers dense buckthorn thickets as nesting habitat (personal communication from Bruce Fall, retired University of Minnesota and Bell Museum of Natural History ornithologist and the foremost expert on the breeding ecology of this species in Minnesota). As this species becomes more common in the Twin Cities area in coming decades with advancing climate change, there is a possibility that it could breed in the Sanctuary if suitable habitat were developed. Hooded Warbler breeding habitat is described as “undergrowth of deciduous woodlands, thickets, wooded swamps (especially southern areas).” (Harrison, 1975). The most likely places for this species to breed in the Sanctuary would be in the northeastern or south central wooded areas with a mixture of upland and lowland forest. To attract this species, as buckthorn removal is done in these areas, native shrubs should be planted in close proximity to develop thick undergrowth preferred by the Hooded Warbler (and a number of other native songbird species) for nesting.

Species in Greatest Conservation Need

Species in greatest conservation need (SGCN) are animal species whose populations are rare, declining, or vulnerable in Minnesota and meet one or more of the following criteria:

A. Species whose populations are identified as being rare, declining, or vulnerable in Minnesota.

B. Species at risk because they depend upon rare, declining, or vulnerable habitats, (such as native prairies and grasslands; lakeshores and riparian corridors; wetlands; brushlands; unimpounded river and stream channels; unfragmented interior forest).

C. Species subject to other specific threats that make them vulnerable, such as:

- Over-exploitation
- Invasive species
- Disease
- Contaminants
- Lack of citizen understanding and stewardship (such as killing large snakes thought to be venomous).

D. Species with certain characteristics that make them vulnerable, such as species that:

- Require large home ranges/use multiple habitats
- Depend upon large habitat patch sizes
- Need special resources
- Depend upon an ecological process (such as fire) that no longer operates within the natural range of variation (RNV)
- Are limited in their ability to recover on their own due to low dispersal ability or low reproductive rate
- Have a highly localized or restricted distribution (Endemics).
- Concentrate their populations during some time of the year (such as bats clustering in hibernacula and migratory stopovers).

E. Species whose Minnesota populations are stable, but are declining in a substantial part of their range outside of Minnesota (such as Common Loon or Black Tern).

Thirty-seven species of birds that have been observed in the Sanctuary are on the proposed SGCN list that will soon be formally approved (personal communication with DNR Endangered Species Coordinator Richard Baker, February 8, 2016).

Eight SGCN species have only been recorded flying over the Sanctuary, as follows:

Lesser Scaup: Occasional spring migrant.

Common Loon: Uncommon spring migrant and rare fall migrant (one record).

Northern Harrier: Rare fall migrant (one record).

Common Nighthawk: Uncommon spring migrant and summer visitor, rare fall migrant (one record).

Chimney Swift: Uncommon spring and fall migrant, common summer visitor.

American Kestrel: Rare fall migrant (one record).

Northern Rough-winged Swallow: Occasional spring migrant.

Evening Grosbeak: Rare fall migrant (two records).

None of these species are likely to breed in the Sanctuary, as their preferred breeding habitat is not present. The Sanctuary currently provides aerial insects that both Chimney Swifts and Common Nighthawks that breed in chimneys and on flat roofs, respectively, not far from the Sanctuary currently use for food and for feeding nestlings during the breeding season. The Chimney Swift could potentially breed closer to the Sanctuary if a suitable nesting box was erected and maintained in a nearby open location like the Rose Garden. The Minnesota DNR Nongame Wildlife Program is a good source of information on how to obtain and where to erect a Chimney Swift nest box.

Nineteen SGCN species are rare or occasional migrants through the Sanctuary, as follows:

American Black Duck: Occasional spring migrant.

Northern Pintail: Rare fall migrant (one record flying over the Sanctuary).

American Bittern: Rare spring migrant (one record in the Sanctuary).

American Woodcock: Occasional spring migrant.

Yellow-billed Cuckoo: Occasional spring migrant.

Black-billed Cuckoo: Occasional spring migrant and occasional fall migrant.

Eastern Whip-poor-will: Occasional spring migrant and rare fall migrant (two records).

Red-headed Woodpecker: Occasional spring migrant and rare fall migrant (one record).

Western Kingbird: Rare spring migrant and rare fall migrant (two records).

Sedge Wren: Occasional spring migrant and occasional fall migrant.

Prothonotary Warbler: Rare spring migrant (in former decades was an occasional migrant, with at least three spring records) and rare fall migrant (one record).

Connecticut Warbler: Occasional spring migrant (declining in numbers).

Cape May Warbler: Occasional spring migrant and occasional fall migrant.

Black-throated Blue Warbler: Rare spring migrant (two records) and occasional fall migrant (previously an uncommon fall migrant).

Eastern Towhee: Occasional spring migrant.

Field Sparrow: Occasional spring migrant and rare fall migrant (one record).

Le Conte's Sparrow: Rare fall migrant (at least two records).

Eastern Meadowlark: Rare spring migrant (one record in the Sanctuary).

Purple Finch: Occasional winter visitor, rare spring migrant (two records), and occasional fall migrant.

One of these species, the Red-headed Woodpecker, used to breed in the Sanctuary as well as in adjacent Lakewood Cemetery until about the early 1990s (Steve Carlson, personal communication). With the almost certain death of virtually all mature Green Ash in the Sanctuary due to EAB, there is a possibility that this woodpecker could once again nest in the Sanctuary if most snags are retained. Green Ash comprises 17 percent of the tree cover, so abundant dead trees and dead branches of live trees, the preferred nesting habitat of Red-headed Woodpeckers, should be attractive to them.

Yellow-billed Cuckoo and Black-billed Cuckoo were both listed as “nesting” in the Sanctuary by Morrison, et. al. (1955). Harrison (1975) describes the breeding habitat of the Yellow-billed Cuckoo as “dense thickets in open woods (rarely in heavy woods), roadsides, streambanks, rural orchards, brushy overgrown fields, with copse of small trees (crabapple), vines....Thick bushes overgrown with wild grape favored” for nesting (p. 93). The Black-billed Cuckoo’s breeding habitat consists of “groves of trees, forest edges; thickets; prefers more wooded areas than Yellow-billed Cuckoo.” (p. 94) It is possible that these two very uncommon species could once again breed in the Sanctuary. As buckthorn removal is done in the upland forest areas of the Sanctuary, native shrubs should be planted in close proximity to develop the dense thickets preferred by these species for nesting.

It is highly unlikely that any of the other 16 species listed above would breed in the Sanctuary, as their preferred breeding habitat is either not present or not extensive enough to support nesting, or their breeding range does not include the Twin Cities area and Hennepin County.

The ten remaining SGCN species are uncommon migrants through the Sanctuary mostly in spring and less common or absent in fall, as follows:

Black-crowned Night-Heron: Uncommon spring migrant.

Belted Kingfisher: Uncommon spring migrant and occasional fall migrant.

Olive-sided Flycatcher: Uncommon spring migrant and uncommon fall migrant.

Philadelphia Vireo: Occasional spring migrant and uncommon fall migrant.

Winter Wren: Uncommon spring migrant and uncommon fall migrant.

Veery: Uncommon spring migrant and occasional fall migrant.

Wood Thrush: Uncommon spring migrant and rare fall migrant (one record).

Brown Thrasher: Rare winter visitor, uncommon spring migrant, and uncommon fall migrant. Declining.

Golden-winged Warbler: Uncommon spring migrant and uncommon fall migrant.

Bay-breasted Warbler: Rare spring migrant (one record) and uncommon fall migrant.

There is too much human use of the Sanctuary to support breeding Black-crowned Night-Herons, and there is no record of this species having bred there in previous decades. With one exception (Wood Thrush), the habitat in the Sanctuary is either unsuitable for these species to breed in (e.g., Belted Kingfisher, Brown Thrasher) or is outside of the species’ normal breeding range.

According to Morrison, et. al. (1955), the Wood Thrush formerly bred in the Sanctuary. This species conceivably could do so again in the future with appropriate habitat restoration. Its preferred breeding habitat is “cool, humid forests, mainly deciduous; parks, gardens.” (Harrison, 1975, p. 157) In my experience this species is especially fond of nesting in sugar maple saplings in deciduous forest. The remnant maple-basswood forest in the south central part of the Sanctuary, where there is already sugar maple regeneration, would be a likely location for this species to nest. Additional sugar maple could be

under-planted in this area, including in areas to the west of the knoll toward the ephemeral stream when buckthorn is removed.

Species That Potentially Could Breed in the Sanctuary in the Future

One silver lining of climate change, at least for birders, is the prospect of breeding range extensions and increased numbers of breeding pairs of several species that are currently rare in the Twin Cities area and in the Sanctuary. Species that could increase in frequency of occurrence in the Sanctuary in future decades and potentially become occasional or regular nesting species include:

Tufted Titmouse: Prior to 1972, this species was an occasional spring migrant or resident and a rare summer and fall resident in the Sanctuary, and conceivably could have bred there. This species nests in both deciduous and coniferous forests, swamps, orchards, and suburban shade trees (Harrison, 1975).

Carolina Wren: This species is a rare spring visitor to the Sanctuary, but suitable nesting habitat currently exists in the Sanctuary and could be enhanced if as buckthorn is removed from the upland forest areas of the Sanctuary, native shrubs are planted in close proximity to one another to develop the brushy forests and dense, shrubby thickets preferred by this species for nesting (Harrison, 1975).

Blue-gray Gnatcatcher: This species is an uncommon spring migrant as well as an occasional summer visitor and fall migrant in the Sanctuary. It is currently a far more common breeding species in the Twin Cities area than it was even 10-20 years ago, and suitable nesting habitat (oak woods, mixed forests, wooded swamps) (Harrison, 1975) is present in the Sanctuary.

Hooded Warbler: See the text on the top of page 19 of this report.

Bird Habitat Protection and Restoration Recommendations

Goals from the 2014 MPRB T. S. Roberts Bird Sanctuary Management Plan

The recommendations outlined below are intended to help achieve the goals for improving the condition of the Sanctuary included in the Sanctuary management plan, with particular emphasis on the first and third goals because of their emphasis on protecting, preserving, enhancing, and minimizing adverse impacts of infrastructure on bird habitat (MPRB, 2014):

Three goals were developed for improving the condition of the Sanctuary:

- 1) Protect, preserve, and enhance the bird habitat and native plants contained within the Sanctuary for present and future generations of people and wildlife;
- 2) Educate and inspire people about birds and their habitats, Minnesota native plants, and the natural world; and
- 3) Provide a minimal infrastructure for the Sanctuary that honors the integrity of this undeveloped natural area as a bird sanctuary and a place that connects people with nature.

Potential Bird Habitat Improvement Projects

The following projects listed in **bold type** were identified by project partners in developing the 2014 T. S. Roberts Sanctuary Management Plan (MPRB, 2014). One or more potential options for implementing these projects are listed below each project. These options are not listed in priority order. Priorities should not be developed until the public involvement process is completed.

These options were developed based on the existing Sanctuary Management Plan; consultation with Jason Aune of Aune Fernandez, Landscape Architects, St. Paul, Minnesota, lead project team member; and potential climate change considerations I became aware of through a webinar I took with the Northern Institute of Applied Climate Science, a part of the USDA Forest Service Northern Research Station in Houghton, Michigan. An especially important reference document for the webinar that provided part of the basis for some of the options listed below is Swanston and Janowiak (eds.), 2011.

Repair or replace the perimeter fencing.

The current chain link fence around the Sanctuary is in very poor condition. There are areas where the fence is down in hundreds of foot long sections, areas with holes, and other areas where the posts are no longer supporting the fence. Several aspects need to be considered when evaluating whether to replace or repair the existing fence:

- What is the reason for the fence?
- What or who are you keeping out or keeping in?
- Police security
- Access
- Safety
- Deer exclusion (fence must be at least 8 feet and probably 10 feet high)
- Ownership (Lakewood Cemetery owns and maintains the fence on the northern Sanctuary boundary)
- Cost (of removing existing fence, replacing the fence, and maintaining the fence in future years)
- Environmental impacts of removing the existing fence (e.g., impacts on vegetation and bird habitat, soils, water quality, aesthetics)
- Feasibility

There are several potential options for transforming fence repair and replacement into an actual project. They include the following:

- Remove and replace the chain link fence along the eastern border of the Sanctuary from the Lakewood Cemetery boundary on the north to the maintenance area on the south (or perhaps all the way to the road). Consider adding several acres to the Sanctuary by enclosing the triangular wooded area immediately east of the northeastern boundary of the Sanctuary and immediately south of Lakewood Cemetery. This 2-3 acre area is the highest quality upland forest habitat that is immediately adjacent to the Sanctuary.
- As part of the option described immediately above, consider moving the main eastern Sanctuary entrance north by 200 feet so that visitors, including disabled and elderly visitors, can enter the Sanctuary more safely on level ground. Reconstruct this entrance to make it more attractive and inviting to prospective visitors.

- Remove and replace the chain link fence along the western border of the Sanctuary from the Lakewood Cemetery boundary on the north to the road along the north end of Lake Harriet.
- Incrementally remove and replace the chain link fence along the southern border of the Sanctuary over a set time period.
- Encourage Lakewood Cemetery (which owns and is responsible for the chain link fence along the northern boundary of the Sanctuary) to repair existing holes in the fence.

Enhance the east entry area and the Sanctuary by replacing the existing boardwalk to include sections that are ADA compliant.

The current boardwalk is in poor and declining condition and is not ADA compliant. The sections of plastic floatable boardwalk are extremely slippery when wet or covered with ice in winter. When evaluating replacement of the existing boardwalk, the following aspects must be considered:

- ADA accessibility and legality
- Safety
- Long-term durability and maintenance needs
- Police security
- Cost
- Birding accessibility to areas of high quality habitat
- Aesthetics
- Feasibility

There are several potential options for transforming boardwalk replacement into an actual project. They include the following:

- Identify hazard trees (especially mature Green Ash, which in coming years will be killed by EAB). Relocate the boardwalk or trail infrastructure so that the alignment will not be affected by future EAB hazard Green Ash trees.
- Consider different configurations for the east Sanctuary entry to enhance accessibility, safety, and bird identification, nature interpretation, and other educational opportunities.safety.
- Reconstruct an ADA compliant boardwalk in the vicinity of the interpretive area, either a loop Remove invasive species around this area (especially buckthorn) and replace them with native plantings that are attractive to songbirds. Given past funding support for creation of this boardwalk in the Sanctuary in the 1980s, the Legislative Citizens Commission on Minnesota Resources would be one good potential source of funding for this project.

Enhance the west entry area to be ADA compliant and increase visitor safety.

The current configuration of this entry area includes a grade change of approximately 3-4', concrete steps, and fencing configured to allow people but no bicycles to enter. Any visitors on this side of the Sanctuary have to navigate the busy parkway and immediately transition to steps located directly on the back of the parkway curb. There will be several considerations when evaluating whether to enhance the west entry. They include the following:

- Policy security
- Access
- Safety
- Cost
- Feasibility

There are at least two potential ways to transform west entry reconfiguration into an actual project:

- Evaluate options that are being proposed in the current Chain of Lakes Master Plan.
- Add an interpretive area, landing zone, ADA-compliant ramp, and gateway at the west entry to enhance safety, accessibility, educational and interpretive value, and aesthetics. Remove invasive species (especially buckthorn) in this area and replace them with native plantings that are attractive to songbirds. Plant native wildflowers that are attractive to Ruby-throated Hummingbirds (e.g., cardinal flower, jewelweed) and a variety of other native wildflowers and berry-bearing native shrubs. Plant several sapling Big-toothed Aspen adjacent to the small existing mature Big-toothed Aspen trees on the south side of the entrance.

Develop educational resources for the visitor's shelter that support the vision and goals of the Sanctuary.

- Work with MPRB interpretive staff to seek funding for interpretive displays and interpretive programming about the history, natural history, and especially the birds of the Sanctuary. Given past funding support for interpretive materials about the Sanctuary in the 1980s (e.g., see MPRB, 1993), the Legislative Citizens Commission on Minnesota Resources would be one good potential source of funding for this project.

Replace existing signage at both entrances to provide important notices to visitors.

- Post signs indicating activities that are permitted and encouraged (e.g., birding, nature study, hiking) and activities that are prohibited (e.g., motor vehicles, bikes, walking dogs).

Identify and implement ways to ensure uses of lands immediately adjacent to the Sanctuary boundaries complement and support the vision and goals of the Sanctuary.

- Consider adding several acres of MPRB park land to the Sanctuary by enclosing the triangular wooded area immediately east of the northeastern boundary of the Sanctuary and immediately south of Lakewood Cemetery. This 2-3 acre area is the highest quality upland forest habitat that is immediately adjacent to the Sanctuary.
- Hold regular litter removal events using volunteers between the southern boundary of the Sanctuary and the road along the north end of Lake Harriet.
- Plant native woody and herbaceous species attractive to birds and pollinators near the main sanctuary entrance by the eastern sanctuary border. Plant native wildflowers that are attractive to Ruby-throated Hummingbirds (e.g., cardinal flower, jewelweed) and a variety of other native wildflowers and berry-bearing native shrubs.

Provide a trail network consistent with the Sanctuary's vision.

- Resurface the main east-west trail along the sewer interceptor line so that the trail is ADA-compliant.
- In conjunction with reconstructing the west Sanctuary entrance and replacing the chain link fence along the western boundary of the Sanctuary, develop a trail immediately to the west of the new fence that connects the trail along the north end of Lake Harriet with the reconstructed west entrance.

Improve the ecological health of the Sanctuary's woodland and wetland areas.

- Focus especially intensive invasive species removal and subsequent native tree and shrub planting efforts in the relatively high quality upland hardwood stands in the south-central, northeastern, and northwestern parts of the sanctuary, and on the area of lowland forest to the west of the upland hardwood stand in the south-central part of the Sanctuary up to the north-south flowing stream.
- Focus especially on removing buckthorn, garlic mustard, white mulberry, and Tatarian honeysuckle using volunteer labor in appropriate seasons and locations for each species. Plant red oak, white oak, sugar maple, ironwood, prickly ash, gooseberry, and red-berried elder seedling on the well-drained, sandy-loam soils in the remnant hardwood stand in the south-central part of the Sanctuary. This stand is the highest quality remnant upland hardwood forest in the Sanctuary, and has potential for attracting nesting Blue-gray Gnatcatchers and Wood Thrushes in future decades.
- Focus especially intensive invasive species removal efforts on open sunny areas with low quantities of invasive species, and focus opportunistically on areas of the sanctuary that have recently experienced disturbances that resulted in the loss of mature trees.
- Plant a diverse suite of native trees and shrubs of suitable species that provide high quality bird habitat in gaps created when mature trees are lost due to blowdown, insects, disease, and removals. Initially select open sunny areas with reasonably good access and low numbers of invasive species, and then move into areas with higher numbers of invasive species. Use species that will maintain and enhance species and structural diversity (both of which are important in providing habitat for diverse bird communities) by promoting retention or introduction of diverse age classes. Favor or restore native species that are expected to be better adapted to future conditions and that have wide moisture and temperature tolerances (e.g., red oak and white oak on upland sites, swamp white oak on lowland sites).
- Given the prevalence of green ash in the forest canopy and understory and the fact that Emerald Ash Borer (EAB) is already present in the sanctuary, anticipate and plan for the loss of all or virtually all mature and many younger green ash trees in the sanctuary. As this loss occurs incrementally in coming years, remove only those mature dead or dying ash trees that present a direct hazard to recreational users along designated trails or other high use areas such as the sanctuary entrances. Retain all other dead and dying ash as snags, which provide critical habitat

for both primary hole nesting species including six species of woodpeckers that currently or potentially could nest in the Sanctuary (including Red-headed Woodpecker), and secondary hole nesting species such as Black-capped Chickadee, White-breasted Nuthatches, Great Crested Flycatcher, and a number of other species of birds and wildlife that breed or potentially could breed in the Sanctuary.

Implement woodland and wetland enhancements based on feasibility and funding.

- Remove Norway maple and Siberian elm from the Sanctuary as funding allows, using MPRB staff and contract labor. Focus initially on areas with low quantities of other invasive species. Also focus especially intensive Norway maple and Siberian elm removal and subsequent planting efforts in the relatively high quality upland hardwood stands in the south-central, northeastern, and northwestern parts of the sanctuary, and on the area of lowland forest to the west of the upland hardwood stand in the south-central part of the sanctuary up to the north-south flowing stream.
- Monitor herbivory on recently planted tree and shrub seedlings to determine if browsing, especially by white-tailed deer, is occurring at a level that needs to be addressed. This is not an issue as of the winter 2015-2016, but could become an issue in the future if deer populations increase or became more concentrated in the sanctuary, especially during winter and spring.
- Weed, water, and mulch the 750 native trees and shrubs that were planted in 2014 along the main trail where the sewer interceptor project was done. Where there are ½ acre to 1 acre gaps in the canopy along this trail, plant one to two white oak or red oak saplings on upland sites and one or two swamp white oak saplings on lowland sites.
- Undertake a major wetland restoration effort to remove invasive species like reed canary grass and buckthorn and replace them with native wetland species. As stated in the 2014 Sanctuary Management Plan: “Recommendations for implementing wetland enhancement projects is beyond the scope of this document and would need to be done by a professional contractor experienced with monitoring and modeling shallow groundwater in wetlands and restoring highly modified urban landscapes. A wetland delineation and complete hydrological study would need to be done as part of any enhancement project to determine the exact wetland areas and the water regime of the Sanctuary.” (MPRB, 2014, p. 49).

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