

## **BIRD-FRIENDLY LANDSCAPE DESIGN GUIDELINES - City of Vancouver EXECUTIVE SUMMARY**

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## 1.0 CONTEXT

In January 2012, Vancouver City Council adopted the “Greenest City 2020 Action Plan” that outlined ten goals to make Vancouver the greenest city in the world by 2020. Goal six: Access to Nature, addressed the need to incorporate nature into our city; “Vancouver residents enjoy incomparable access to green spaces, including the world’s most spectacular urban forest.” Urban wildlife animates our green spaces and birds bring our city to life with their songs and flight, creating excellent opportunities to experience biodiversity in the city. Birds also provide ecosystem services in the form of pest control, pollination and seed-dispersal. In May 2013, Vancouver City Council passed a motion to develop a “Bird-Friendly Strategy” for Vancouver. A key component of the “Bird-Friendly Strategy” is the creation of “Bird-Friendly Landscape Design Guidelines.” The document resulting from this research project will be the first draft of the “Bird-Friendly Landscape Design Guidelines,” to be incorporated as an appendix in the “Bird-Friendly Strategy.”

Vancouver is located on the Pacific Flyway, a migration route that extends from Alaska, in the north, to Patagonia, in the south, making it a prime stop-over for weary migratory birds. There are four nationally recognized Important Birds Areas in Metro Vancouver, totally an area of about 1200 km<sup>2</sup>. These Important Bird Areas generally surround the City of Vancouver drawing migratory, resident and overwintering birds into the urban environment. The proximity of Vancouver to large pieces of habitat makes it important to reduce the threat of urbanization on biodiversity. Habitat loss is the leading cause of bird population declines in British Columbia, and this is partially due to urbanization. As urban development increases worldwide it is expected to become the single largest driver of bird extinction in this century.<sup>1</sup> In Canada’s Pacific Coast region, characteristic birds species have declined by 35% since the early 1970s.<sup>2</sup> Through the protection, creation and maintenance of bird habitat on public and private lands, we can make the City of Vancouver a safe place for birds and a greener, more livable city for people.

The “Bird-Friendly Landscape Design Guidelines” are to be used to support the development of bird habitat throughout the City of Vancouver. The document is to be used by policy makers, developers, planners, landscape architects, operations staff and residential gardeners. When used in conjunction with the “Bird-Friendly Building Guidelines” urban design throughout our city can become more bird-friendly.

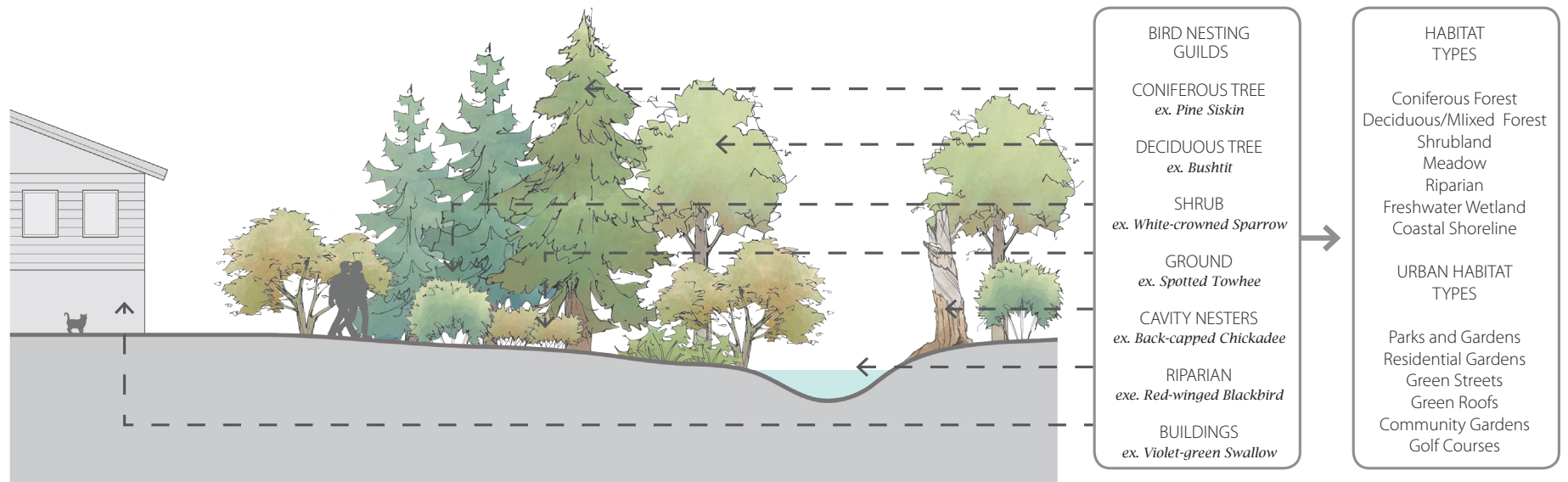
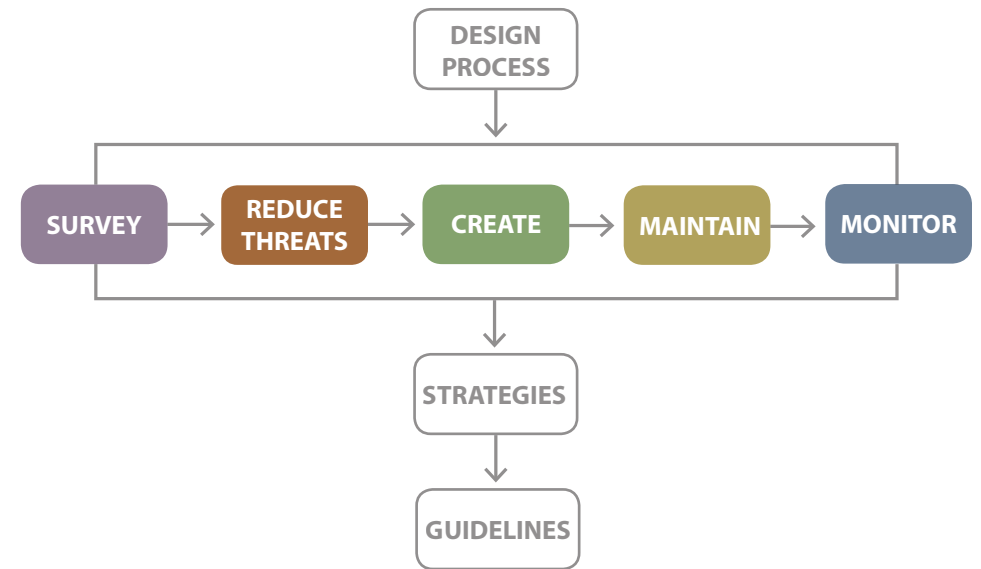


1. John M. Marzluff et al., “Avian Ecology and Conservation in an Urbanizing World,” (Boston: Kluwer Academic Publishers, 2001), 2.

2. Environment Canada, “The State of Canada’s Birds 2012,” (Ottawa: NABCI Canada, 2012).

## 1.1 STRUCTURE OF THE GUIDELINES

The “Bird-Friendly Landscape Design Guidelines” are divided by scale: city scale and site scale, with emphasis on strategies and guidelines for the site scale. A five-step design process organizes the site scale strategies and guidelines. Vancouver’s birds are grouped into seven nesting guilds to ensure the creation of nesting habitat for a wide range of birds. The nesting guilds translate logically into habitat types, for example, birds that nest in coniferous trees require coniferous forest habitat. Specific guidelines for seven habitat types are included to support increased habitat diversity across the landscape: Coniferous Forest, Deciduous and Mixed Forest, Shrubland, Meadow, Riparian, Freshwater Wetlands and Coastal Shoreline. The site scale strategies and guidelines can then be applied to the six urban habitat types described: Parks and Gardens, Residential Gardens, Green Streets, Green Roofs, Community Gardens and Golf Courses.



## 1.2 METHODS

Research for the Landscape Guidelines utilized three methods: precedent review, literature review and key informant interviews. Three precedents were found to be particularly informative and influenced the structure and content of the Landscape Guidelines:

### ***Precedent 1:***

#### **“A Habitat Guide for Chicago Land Owners: Enhancing your Property for Birds,” City of Chicago.**

While there are many cities that have established Architectural Design Guidelines for Birds to address the problem of bird collisions with windows, for example Toronto and Calgary, few cities have written Landscape Design Guidelines to address the problem of urbanization and habitat loss. One notable exception is the City of Chicago. In 2006, the City of Chicago adopted Chicago’s Bird Agenda that established their commitment to creating and maintaining habitat for birds with the proposed action to create habitat guidelines for birds. In October 2007, Chicago published “A Habitat Guide for Chicago Land Owners: Enhancing Your Property for Birds.” This precedent was selected because it was written by a municipality and the structure of the document is effective.

#### ***Highlights:***

- The document is short and concise at only 14 pages in total.
- It is divided into two parts: part one provides recommendations for all properties for migratory and nesting birds and part two outlines guidelines for enhancing property for Chicago birds by habitat type.
- The guidelines under each habitat type are geared towards private landowners and are narrowed to only six to ten recommendations.

- Each page includes a brief case study for each habitat type that describes a public site where the habitat type is dominant and mentions some of the work the Chicago Park District has done to protect these sites.

### ***Precedent 2:***

#### **“Best Practice Guidelines for Enhancing Urban Bird Habitat: A Scientific Report,” Birds in Backyards**

Birds in Backyards is a research, education and conservation program in Australia that is focused on helping urban birds. Even though this precedent is from Australia, it was selected because the guidelines are geared towards the management of urban land and they are supported by a thorough literature review. Many of the principles are transferrable, for example retaining remnant vegetation, however the literature referenced is specific to Australia. A similar approach was adopted in order to generate guidelines that are supported by locally relevant scientific studies.

#### ***Highlights:***

- The “Best Practice Guidelines for Enhancing Urban Bird Habitat” consist of a scientific report and a set of seven separate guidelines targeted to a range of key stakeholders.
- The scientific report provides evidence-based guidance that is relevant for all urban land managers.
- The document is divided into seven parts, the most relevant of these being “Part 2: How to Undertake Habitat Restoration for Birds,” which includes guidance on “Planning and Site Assessment” and “Impacts and Management Considerations.”

## 1.2 METHODS

### ***Precedent 3:***

#### **“River District Urban Songbird Habitat: Landscape Design Guidelines,” Golder Associates, Dr. Patrick Mooney and Don Wuori Design**

These guidelines were created specifically for the River District, an East Vancouver development by ParkLane Homes Ltd. for approximately 10,000 people. The River District is located on a 130 acre brownfield site on the Fraser River. The guidelines were written to ensure that songbird habitat is integrated into the design of the development to maximize a diversity of foraging guilds. Although the focus is on songbirds this is largely a marketing strategy and the design principles would increase overall bird diversity. This third precedent was selected because it is locally relevant, however the challenge is to translate the principles presented in this document to the city scale.

### ***Highlights:***

- Songbirds are separated into twelve foraging guilds of the lower mainland, emphasizing the need to incorporate diverse foraging opportunities.
- Nine regional habitat types are described and key features listed. These regional habitat types have been adapted to seven habitat types in the “Bird-Friendly Landscape Design Guidelines” through cross-referencing with other documents.
- Ten general design principles for the urban landscape are described and can easily be applied to many sites across the City.
- The plant list included in this document is a valuable resource.
- No references are cited in this document.

## 1.2 METHODS

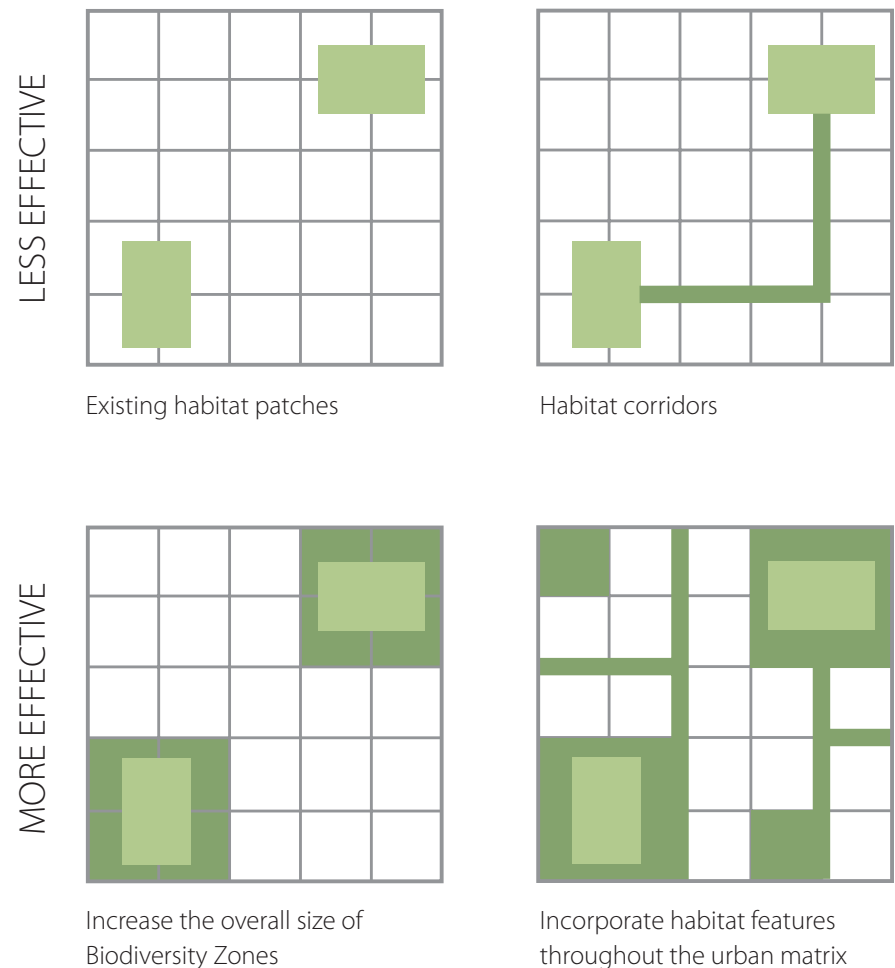
### **Literature Review:**

A scientific literature review was conducted in order to synthesis existing research on birds into a comprehensive set of guidelines. Biologists have been studying birds for a long time but focusing on studies of birds within cities and studies done within Vancouver narrowed the scope of the literature review.

One of the key findings from the literature review is that because of the high dispersal-ability of birds their need for habitat connectivity is lower than in other animals that move on the ground. Few studies demonstrate the importance of connectivity for birds and it is difficult to separate connectivity from other factors like percent forest cover and patch size.<sup>3</sup> This is a complex issue because connectivity overlaps with habitat quantity which is known to contribute to bird diversity and abundance. One study conducted within Vancouver found that large forest fragments support greater bird species diversity and abundance than small fragments because of the increased availability of more diverse habitat features.<sup>4</sup> For this reason, the guidelines do not make reference to habitat corridors, even though these may be needed to increase overall biodiversity. Instead the guidelines suggest: protection and enhancement of large patches of habitat, increasing the overall size of biodiversity zones and establishing site-scale habitat features throughout the urban matrix. Until more research is conducted on urban birds the emphasis should be on habitat quantity, composition and structural complexity.<sup>5</sup>

3. . Environment Canada, "Area-Sensitive Forest Birds in Urban Areas," (2006): 22, accessed May 15, 2013, [www.on.ec.gc.ca/wildlife/publications-e.html](http://www.on.ec.gc.ca/wildlife/publications-e.html).

4. Kenneth Boon Hwee Hr, "Effects of Forest Loss and Fragmentation with Urbanization on Bird Communities in Vancouver" (M.Sc. Thesis, University of British Columbia, 2002).



5. Roarke Donnelly and John M. Marzluff, "Relative Importance of Habitat Quantity, Structure, and Spatial Pattern to Birds in Urbanizing Environments," *Urban Ecosyst* 9 (2006): 99, accessed July 30, 2013, doi: 10.1007/s11252-006-7904-

## 1.2 METHODS

### ***Interviews:***

I conducted ten key informant interviews with experienced bird surveyors and expert bird biologists. I met with four of the interviewees multiple times and also received comments and recommended literature, via e-mail from a number of the interviewees after meeting them. All of these interviews were conducted in person and were conversational in nature. Effort was taken to incorporate suggestions made by all of the interviewees into the Landscape Guidelines. Five of the interviewees were given drafts of the Landscape Guidelines prior to meeting in order to generate feedback. This feedback was extremely useful because it resulted in expert advice on the content of the guidelines. Key issues that came out of the key informant interviews include: the need to reduce threats before attracting birds, the threat posed by vegetation clearing, invasive plant management and control of domestic pets. All of these issues are addressed in the Landscape Guidelines.

Thank you to the following interviewees:

Karen Barry, Bird Studies Canada

Kevin Bell, Nature Vancouver

David Boyd, Nature Vancouver

Jeff Brooks, Birder and former City of Vancouver Director of Social Planning

Dr. Rob Butler, Bird Studies Canada and Pacific Wildlife

Krista De Groot, Environment Canada

Al and June Grass, Nature Vancouver

Dr. Patrick Mooney, UBC

June Ryder, Nature Vancouver

Robyn Worcester, Stanley Park Ecology Society

## 1.3 SAMPLE PAGES

Samples from the “Bird-Friendly Landscape Design Guidelines” are included on the next three pages. The full document will be made available separately. The complete list of references is available in the full document.

## FIVE STEP DESIGN PROCESS FOR THE SITE SCALE

### SURVEY

Awareness of what particular bird species use the site of interest can help guide landscape design decisions. If a particular species is known to visit the site one should learn more about its specific habitat requirements. In addition to bird species, surveys should document existing habitat features like mature trees and nests and identify features that need to be protected. Bird surveys in Vancouver are already pursued by experience bird groups like Bird Studies Canada and Nature Vancouver and are available online. Support for continued bird surveys in Vancouver presents an excellent opportunity to engage nature groups and the public in urban bird conservation while simultaneously collecting important data.

### REDUCE THREATS

It is imperative that threats to birds are reduced before undertaking habitat creation and maintenance. When birds are lured into poor-quality habitat it can create an ecological trap that can reduce populations over time. Environment Canada compiled a list of 13 of the primary human-induced stressors for forest-associate breeding birds in the urban environment. The strategies and guidelines address some of the human-induced stressors identified by Environment Canada including: disruption of ecosystem processes, direct disturbance, habitat alteration and urban sponsored non-native predators.<sup>6</sup> Minimizing these threats before attracting birds will result in more successful habitat creation projects.

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6. Environment Canada, "Area-Sensitive Forest Birds," 4.

### CREATE

Opportunities exist throughout Vancouver to transform the urban landscape into a bird-friendly city. Turning green spaces that have limited ecological value into rich habitat can make our parks more attractive to birds and people. Turning grey spaces like streets and rooftops into green spaces can make Vancouver a more beautiful and healthy place to live. Habitat is created by supporting the four basic needs of birds: food, shelter, nesting and water. Site-scale strategies and guidelines address the basic needs of birds by incorporating diverse habitat features into landscape design.

### MAINTAIN

Once habitat is created it needs to be maintained in a way that is sensitive to the habitat requirements of birds. Conventional maintenance practices need to be altered so that habitat creation is not threatened by disruptive management practices like vegetation removal. The aesthetic preference for heavily maintained landscapes of sprawling lawns in our public parks and residential gardens is detrimental to birds. This does not mean that parks need to look messy; shrubs and trees can be planted in informal garden beds next to patches of mown lawn to accommodate human recreation.

### MONITOR

Habitat creation in the urban landscape is an emerging field of study. In order to learn from projects that build bird habitat in the city, monitoring programs should be established to determine what design guidelines are working and what design guidelines need to be improved. Professional biologists and local birders can contribute valuable information to this discussion through their observations of changes in bird populations and ongoing bird surveys.



## CREATE

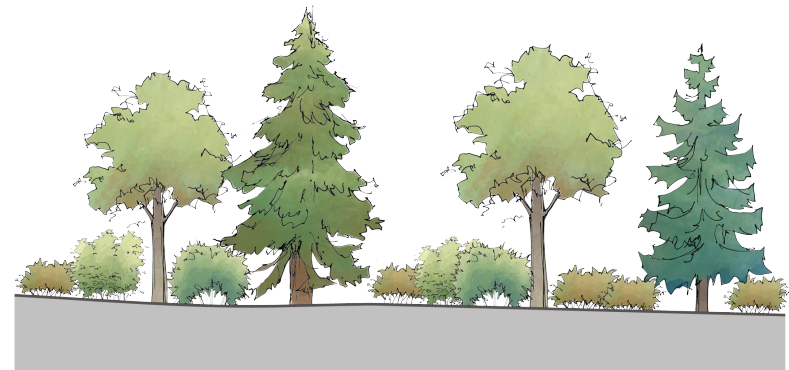
### **Strategy 3.2: Increase vertical vegetation structure.**

Researchers have found that one of the most effective ways to enhance bird species richness and diversity in the urban landscape is by increasing vegetation structural complexity i.e. vegetation layers. Forests with many vegetation layers create more opportunities for foraging, breeding, and nesting for birds. Researchers in Vancouver found that “bird species diversity, evenness of species abundance, and number of species increase with foliage height diversity and total vegetation as they do in ‘natural’ habitats.”<sup>7</sup> Large mature trees have more vertical vegetation structure than young trees, so it is essential to protect and plant large trees. Individual trees have less structural complexity than groups of trees and shrubs, so planting new trees and shrubs together, will increase vegetation structure throughout the city. There can be up to six distinct foliage heights or layers including: a ground cover, shrub, understory and canopy layer to maximize the amount of available bird habitat.

#### **Guidelines:**

1. Increase vertical vegetation structure by creating layers: ground cover, shrub, understory and canopy layers.
2. Tall trees and shrubs are particularly important.
3. Plant shade-tolerant ground cover and shrub plants within forest fragments to increase food and nesting opportunities for birds.
4. Plant ground cover and shrub plants at the base of isolated trees to create an island of layered vegetation.
5. Plant vegetation in a stepped pattern, with large trees in the back, shrubs in the middle and ground cover plants in the front.

7. Richard K. Lancaster and William E. Rees, “Bird Communities and the Structure of Urban Habitats,” *Canadian Journal of Zoology* 57(12) (1979): 2358, accessed August 15, 2013, doi: 10.1139/z79-307.



Shade-tolerant shrubs in forest fragments.



Stepped vegetation layers.



Shrubs at the base of isolated trees.

CALLISTER PARK - Before



CALLISTER PARK - After

