

SEEDS KNOWLEDGE EXCHANGE: Bird Friendly Toolkit

Toolkit Guide



Disclaimer: The UBC SEEDS Sustainability Program provides students with the opportunity to share the findings of their research, as well as their opinions, conclusions and recommendations with the UBC community. The reader should bear in mind that this report is a compilation of student research conducted on the topic of urban biodiversity and should not be construed as an official position of the University. Furthermore, readers should bear in mind that these reports may not reflect the current status of activities at UBC. We urge you to contact the research persons mentioned in a report or the SEEDS Sustainability Program representative about the current status of the subject matter of a project/report.

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1. *The UBC SEEDS Sustainability Program is an internationally recognized Campus as Living Laboratory initiative, that advances UBC's sustainability and wellbeing commitments through applied student-led research and interdisciplinary partnerships between students, faculty, staff and community partners.

2. ***Campus Biodiversity Initiative: Research & Demonstration (CBIRD) is an interdisciplinary and multi-stakeholder hub for connecting academics, practitioners and the wider community in collaborative applied research to advance scalable urban biodiversity ideas, policies and actions on campus. CBIRD is embedded in the SEEDS Sustainability Program, and consists of a Steering Committee including cross-campus representation from multiple academic and operational departments.

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About this Bird Friendly Toolkit



Toolkit Purpose:

Each Toolkit in the **Urban Biodiversity in a Changing Climate ToolTree** aims to support applied student-led research projects in partnership with UBC faculty and staff in ways that can help advance UBC's sustainability and wellbeing commitments. **This Toolkit is focused on how to protect and enhance bird-friendly places on campus. It provides tools to help guide informed decisions to support our feathered friends.** Learn about simple steps that you can take to prevent negative impacts to birds and about proactively caring for bird-friendly landscapes. Student-led research has shown that bird collisions with windows is a significant problem. This Toolkit provides step-by-step options to create bird-safe windows and support bird habitat. This will lead to becoming a more bird-friendly campus.

Who is this Toolkit for?

UBC STUDENTS:

This Toolkit can be used to support student applied research to inform UBC's guiding sustainability policies and commitments, and professional skills development related to the complex challenges connected to climate change and its impacts on biodiversity.

UBC OPERATIONAL STAFF:

This is a collection of summarized knowledge and lessons learned from student-led research which can help UBC practitioners and planners make informed decisions regarding bird-friendly built and natural environments.

UBC FACULTY:

This serves as a resource to integrate biodiversity and climate topics into curriculum, and support student research and professional skills development.

UBC COMMUNITY:

This resource can promote community engagement and collaboration on biodiversity and climate change challenges and opportunities at UBC and beyond.



What will you Learn?

This Toolkit covers several topics related to creating bird-friendly spaces. Learning outcomes include:

1

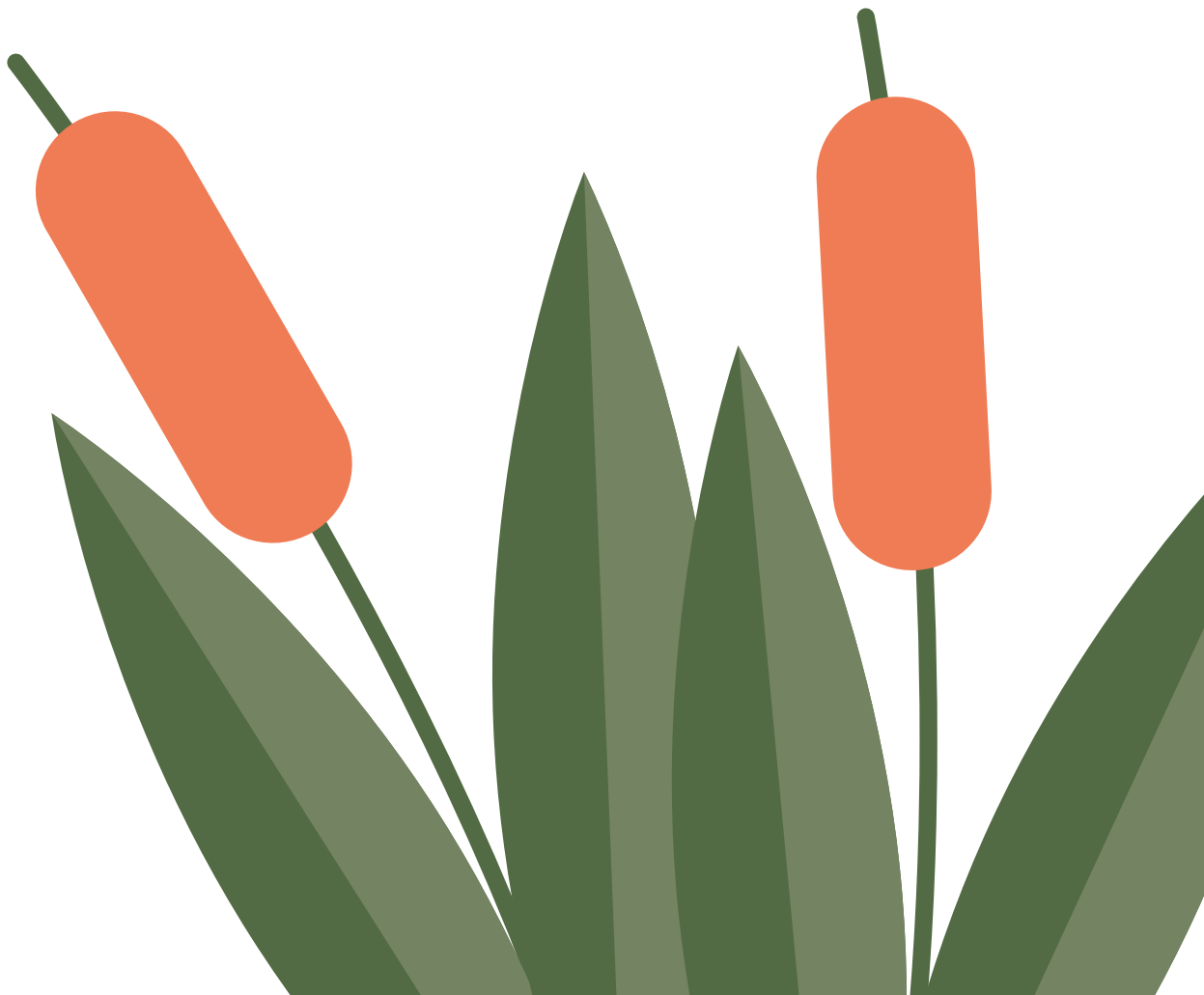
Learn about why birds are important and why UBC Vancouver and the Lower Mainland are important habitats for birds.

2

Learn what you can do to prevent bird collisions with windows, and what to do if you find an injured bird.

3

Learn about bird-friendly landscapes and how you can help create and maintain bird habitat.



Birds Matter!



Why do Birds Matter?

Birds are important for people and ecosystems. Some of the ways that birds contribute to the health and functioning of ecosystems include pollination, seed dispersal, and regulating insect and rodent populations.³ Birds are also important for human health and wellbeing.⁴ People enjoy and appreciate our feathered friends for their birdsong, the visual enjoyment they provide, and other contributions to ecological health. At the same time, birds are rapidly losing habitat and face other threats due to urbanization. On UBC-Vancouver campus alone, an estimated 10,000 birds die every year because of building collisions.⁵ Birds Canada identifies the [five greatest threats](#) to birds in Canada as habitat loss, bird collisions, pesticide use, cats (an invasive species) and climate change. This Toolkit addresses the first three.

The UBC Vancouver campus is located along the Fraser River Delta, an Important Bird and Biodiversity Area (IBA) and a major stop for migratory birds along the Pacific Flyway. The Pacific Flyway is one of the central pathways that birds use to travel between the northern and southern hemispheres. IBAs are recognized areas that provide essential habitat for significant bird populations and they are part of a program delivered by [BirdLife International](#) in Canada. [Important Bird Areas Canada](#) recognizes four Important Bird Areas (IBAs) in the Lower Mainland: the Fraser River Estuary (Boundary Bay - Roberts Bank - Sturgeon Bank); Pacific Spirit Regional Park; and English Bay, Burrard Inlet and Howe Sound; and the Greater Vancouver Watershed.

In Canada, migratory birds and their nests are protected by the [Migratory Birds Convention Act](#) and in British Columbia through the [BC Wildlife Act](#). The Government of Canada has clear [guidelines](#) on how to reduce harm to migratory birds, including what you can do to protect nests. In Vancouver, the [nesting period for migratory birds](#) is from late March to mid August (with most birds nesting from May

until July). [Explore a map](#) from the Migratory Shorebird Project to see where different shorebird species are seen throughout the year across the north and south Pacific.

Many other birds make UBC-Vancouver campus and the surrounding Pacific Spirit Park their home year-round. You can enjoy the beauty of a variety of songbirds and other feathered friends even in the winter!



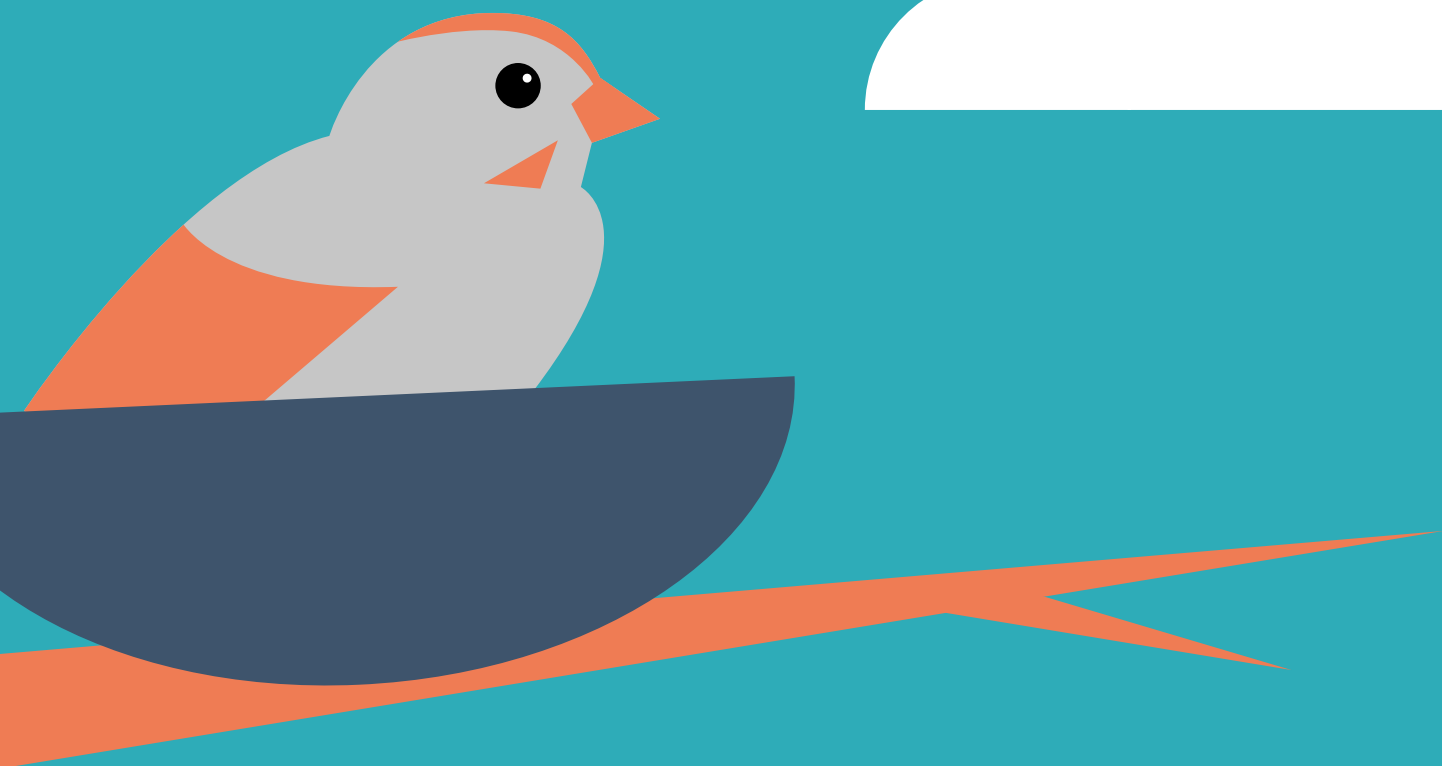
Map of North America showing major migratory routes, highlighting the Pacific Flyway.

3. Sekercioglu, 2006; Viswanathan et al., 2015; Whelan et al., 2015; Freeman et al., 2021

4. Cox et al., 2017; Chen et al., 2022

5. De Groot et al., 2021

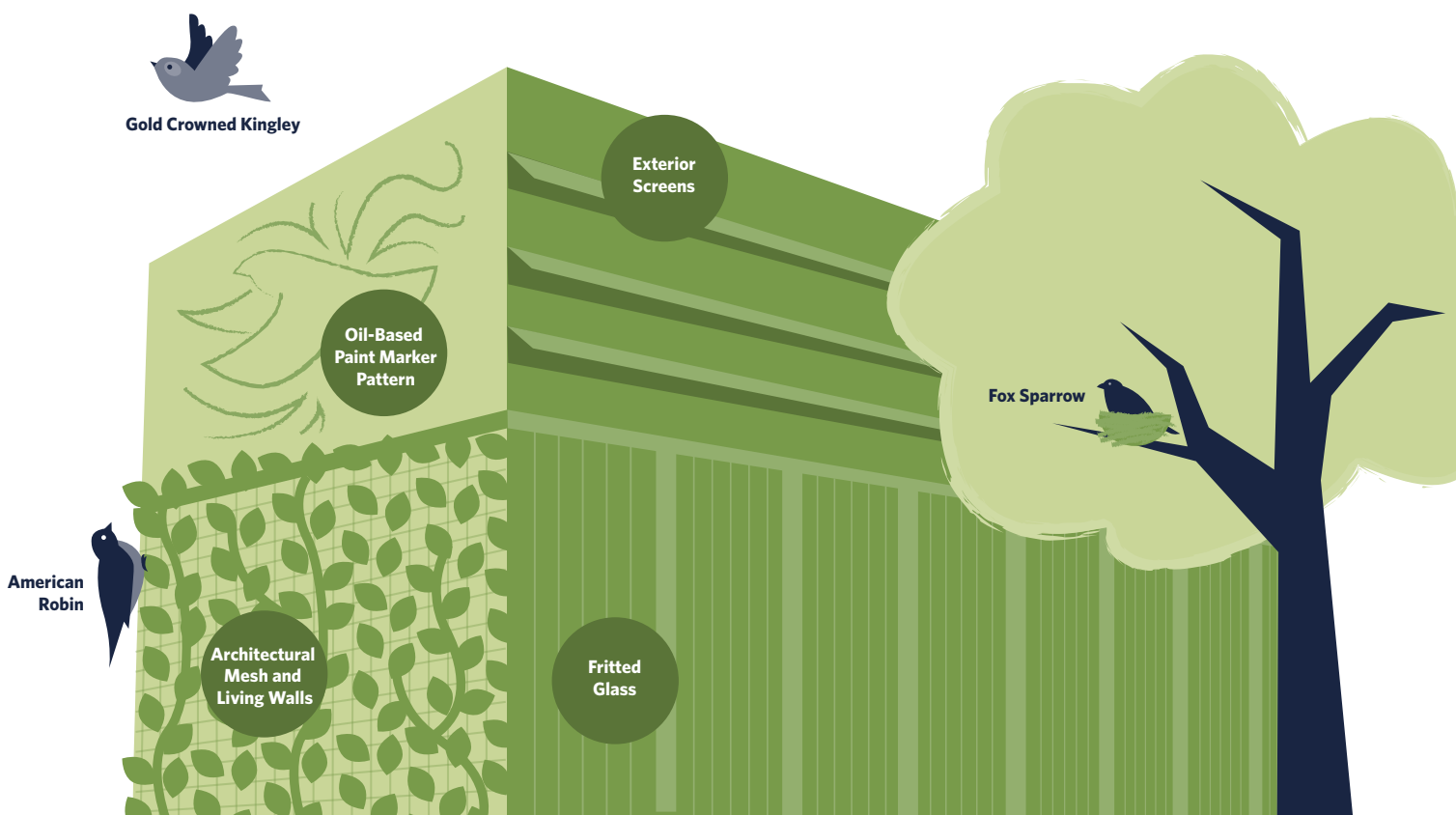
Bird Strikes



What are Bird Strikes?

Collisions with buildings are a major threat to bird populations in North America. The term “bird strike” refers to when a bird collides with a building window. These collisions are often fatal for birds, mostly as a result of head and neck trauma.⁶ Collisions are one of the leading human causes of bird deaths, with up to 42 million avian deaths estimated in Canada and 1 billion in the United States occurring every year.⁷ FLAP Canada, an organization that is at the forefront of bird-friendly building advocacy, manages an interactive map of reported bird collisions.⁸ You can explore the Global Bird Collision Mapper [here](#).

BIRD FRIENDLY DESIGN STRATEGIES



Bird collisions are the result of bird biology (their visual system, preferred habitats and diets, and migratory patterns) and building and landscape features (number, style and location of windows and distance from vegetation). Birds often see reflective glass as an extension to the landscape or a passageway to fly through, resulting in a collision. Speed also plays a factor: by the time birds are close enough to detect the window, they can't slow down to prevent a collision. Many collisions occur during the day, when birds are most active.

6. Veltri & Klem, 2005

7. Machtans et al., 2013; Loss et al., 2014

8. Fatal Light Awareness Program (FLAP) Canada

How to Prevent Bird Strikes

Are you concerned about your building's impact on birds? Whether at home, studying, or at work, you can help make your windows visible to birds. There are many DIY solutions that you can use to create patterns on glass surfaces – read on for tips. [SEEDS student research](#) at UBC Vancouver has shown that **many people on campus agree that bird-friendly decals do not detract from window views or building aesthetics.**⁹



Bird-friendly window design at the Centre for Interactive Research on Sustainability (CIRS) on the University of British Columbia Vancouver campus.



9. Park and Lai, 2017.

ADVOCATE FOR BIRD-FRIENDLY CAMPUS BUILDINGS!

Contact your building manager and advocate for bird-friendly windows that do not require a full retrofit. The building can purchase and install pre-made window markers (like these [Feather Friendly® strips](#)), or you can decide to install a bird-friendly art design that incorporates and reflects your building's use and values. As outlined in [UBC's Bird-Friendly Building Design Guidelines](#), make sure whatever pattern you choose covers the entire exterior glass surface. Markers should be at least 0.32 cm thick and have a maximum of 5 cm space between them (vertically and horizontally).

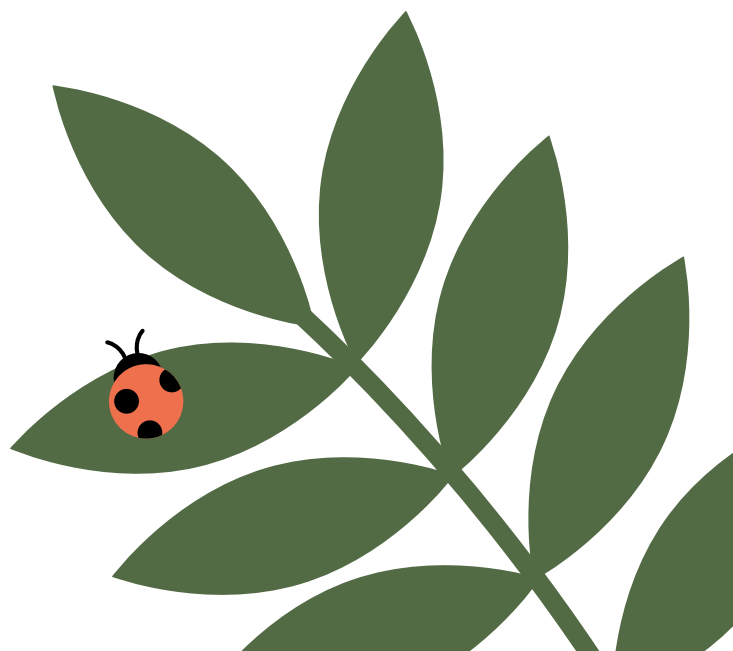
See below for additional considerations if you would like to make a UBC building bird-friendly.

INSTALLING BIRD-FRIENDLY WINDOW DESIGNS

TECHNICAL AND REGULATORY CONSIDERATIONS

BUILDING PERMIT	HEIGHT OF CHOSEN WINDOW(S)	WINDOW CLEANING	WEATHER	UNION ENVIRONMENT
<p>A Building Permit is required if outside appearance of building is changed.</p> <p>Once design is completed, contact Green Building Manager for assistance in securing a Building Permit.</p>	<p>Consider window accessibility and height.</p> <p>Reach out to Building Operations and private operators for installation costs; difficult-to-access windows may have higher installation costs.</p>	<p>Before finalizing the design, reach out to Building Operations to determine whether and how they will be able to clean the window.</p>	<p>Many materials can only be installed in certain temperatures.</p> <p>Consider how weather may impact installation.</p>	<p>UBC operates in a union environment.</p> <p>Building Operations need to be consulted prior to hiring an outside contractor.</p>

ADAPTED FROM MCGREGOR ET AL 2020 (SEEDS REPORT)



MAKE YOUR OWN DESIGN!

One low-budget option for bird-friendly window art is to draw a design with oil-based paint markers. If you have a big window, this works best with a team of dedicated volunteers. Use a medium-tipped, **white oil-based paint marker** to make sure each line is as visible and reflective as possible.

1 Clean the outside of your windows.

Tip: mix equal parts white vinegar with water in a spray bottle for an easy-to-make eco-friendly window cleaner.

2 If you are creating a custom design: Using an erasable whiteboard marker, draw a design (or tape a pattern) on the inside of the window. Make sure you cover the entire window. Do not leave spaces larger than 5cm between markings!

3 Trace the design on the outside of the window with your white, oil-based paint marker.

4 To remove, wash off with hot soapy water.



Hand-painted design on Beaty Biodiversity Research Centre on UBC Campus. Image Credit: Derek Tan

For design ideas, check out the [Audubon Society's Bird Stencils](#), or use Science World's [Anna's Hummingbird Stencil](#) and simple [Dot Stencil](#). Remember, if you use one of these bird outlines, fill in the design with dots and/or lines every 5 cm.

Oil-based paints can last a long time – up to four years in sheltered spaces! If you are painting a window directly exposed to wind, rain, and sun, you may need to do periodic touch-ups and replace the design yearly.

If you prefer a more temporary design, you can use white tempera paint and a paintbrush. Tempera paint will wash off in the rain, and this is only recommended if you would like to change your design frequently.

For more ideas for materials, the city of London (Ontario) compared wax pencils, acrylic paint markers, and oil-based paint markers for their ease of use and durability – [read more here](#). Note that while the Dixon wax pencils were easy to apply (and long-lasting), their pattern was not as bright, and lines needed to be drawn multiple times to ensure full uniform coverage (which may limit their effectiveness to prevent bird strikes). They still recommended the **oil-based paint markers as one of the best solutions** to make windows bird-friendly.

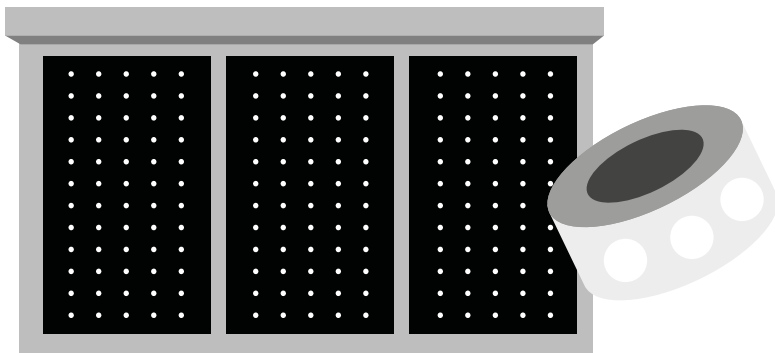


INSTALL BIRD-FRIENDLY TAPE

If you don't want the pressure of painting your own design, you can buy decals or other window markers to apply to your windows. There are several options available, including small dots, big squares, or even the outlines of birds.

Researchers at Environment and Climate Change Canada found that Feather Friendly® window treatments reduced bird collisions by 95% in the Lower Mainland.¹⁰ For the decals to be effective, they should cover the entire exterior glass facade. Feather Friendly® tape is a reputable brand. They have several DIY options that come with detailed installation instructions. See the options and purchase them [here](#). Each roll should be enough to cover 16-square-feet of glass.

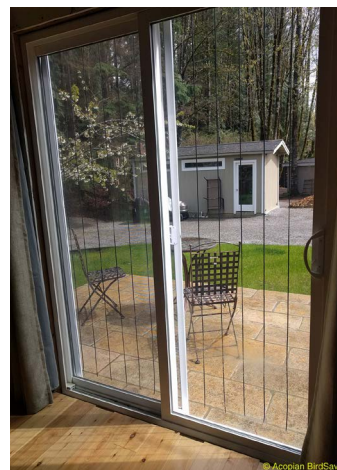
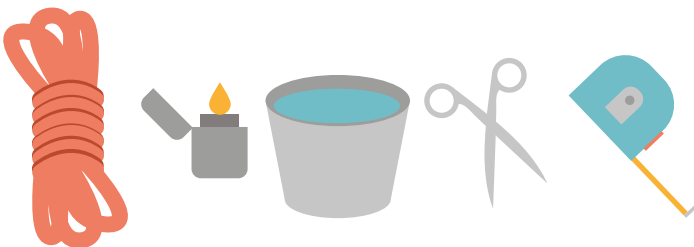
Note: you can only install these markers when it is at least 10°C outside!



MAKE ZEN WIND CURTAINS

If you're feeling crafty, you can create and install Zen Wind Curtains – also called [Acopian Bird Savers](#). To make them, use rope to create evenly spaced vertical lines across your entire window. There are different methods to create one yourself, but the cheapest option is to make it entirely out of paracord. You will need: paracord, a lighter (to seal the cut edges), a bucket of hot water (to pre-shrink the cord), something to cut the cord, and a measuring tape. You will also need something to install the Acopian BirdSaver – Command Clips for outdoor lights work well.

Follow along with this [video](#), or check out detailed [step-by-step instructions](#) (complete with trouble-shooting appendix).



Zen Wind Curtains installed on exterior of window.

10. De Groot et al., 2022

WHAT IF I CAN'T ACCESS THE OUTSIDE OF MY WINDOW?

For decals and other designs to be effective, they should be installed on the outside of the window. This is to visually break up reflections of vegetation and open sky.

ABC Birds recommends doing a simple test to determine whether applying a bird-friendly solution to the inside of a hard-to-reach window may work. First, draw a design on your window. Then, go outside and look at your window. Make sure to go at different times of the day (including early morning). If your design is clearly visible, chances are that birds will be able to see it too!

You can also keep plants away from indoor windowsill ledges to avoid attracting birds.



What can I do if I find an Injured Bird?



- 1. Stop and observe.** If the bird is visibly injured (bleeding, stunned, sleepy), **take action.**
- 2. Take a picture** (to help experts identify what the bird needs).
- 3. Find a cardboard box** big enough for the bird. Poke small air holes so the bird can breathe.
- 4.** Use a towel, shirt or sheet to cover the bird and **gently** scoop it into the box. Birds are fragile. **Do not feed the bird or give it water.** Handle the bird as little as possible to minimize stress and allow them to recover.
- 5.** There is a good chance that the bird is injured and needs medical attention. Contact a local **wildlife rehabilitator** licensed to care for birds:

Lower Mainland: [Call the Wildlife Rescue Association of BC](#) at 604-526-7275 (10am-4pm, 7 days a week). They may ask you to bring the injured bird to their center in Burnaby.

If you found a **raptor** (bird of prey) in the Lower Mainland, you can call [OWL](#) (Orphaned Wildlife Rehabilitation Society) at 604-946-3171 (24 hours a day), located in Delta.

Okanagan: Contact the [Interior Wildlife Rehabilitation Society](#) by email for details and instructions.

Elsewhere in British Columbia: Find a local-to-you [Wildlife Rehabilitator](#) through the Wildlife Rehabilitators' Network.

- 6.** If you find a dead bird on UBC Vancouver Campus, contact Building Operations at 604-822-2173 or at servicecentre.buildingops@ubc.ca for assistance removing the bird.
- 7.** If the bird collided with a window, consider reporting it on the [Global Bird Collision Mapper](#).

How to Promote Bird-Friendly Habitats



How Can I Support Bird-Friendly Habitat?

OUTDOOR LIGHTING

Thinking about stringing up lights in your balcony, patio, or yard? Be thoughtful about outdoor lights! Choose green or blue lights (instead of red or white) to be more bird-friendly.¹¹

Lights at night can disorient birds. Don't forget to **turn off your lights in the evening**, especially during spring and fall migratory periods.¹²

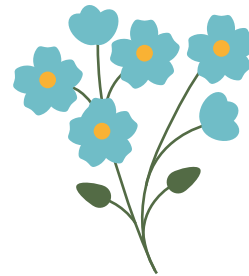
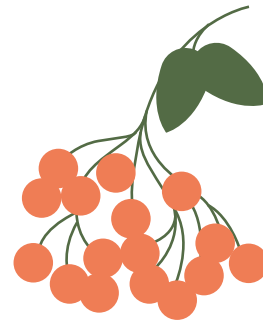


BIRD-FRIENDLY PATIOS, YARDS AND BOULEVARDS

When deciding on plants to create a bird-friendly space, choose native plants that also provide food and shelter to birds. If you can, include trees and shrubs native to the local area and climate. Many birds' diets include insects, so bird-friendly planting often means pollinator-friendly planting too!

There are many resources available for bird-friendly gardening tips for the Lower Mainland:

- [Gardening with Native Plants in the Lower Mainland and Fraser Valley](#) (Fraser Valley Conservancy)
- [City of Vancouver Bird Friendly Operational Guidelines](#)
- [BC SPCA Tips for Bird-Friendly Backyard](#)
- [Selecting Plants for Pollinators](#)



Some planting ideas include:

SHRUBS AND BERRIES:

Red Flowering Currant (*Ribes sanguineum*)
Snowberry (*Symphoricarpos albus*)
Salmonberry (*Rubus spectabilis*)
Evergreen Huckleberry (*Vaccinium ovatum*)
Red-osier Dogwood (*Cornus sericea*)

FLOWERS:

Showy Milkweed (*Asclepias speciosa*)
Red Columbine (*Aquilegia formosa*)
Douglas' Aster (*Aster subspicatus*)
Nodding Onion (*Allium cernuum*)

FERNS AND GRASSES:

Sword Fern (*Polystichum munitum*)
Deer Fern (*Blechnum spicant*)
Sedge Grass (*Carex* spp.)

11. Poot et al., 2008

12. Van Doren et al., 2017

LOOKING FOR MORE WAYS TO DESIGN A BIRD-FRIENDLY GARDEN SPACE?

For more ideas for creating bird-friendly gardens specific to where you live, [Birds Canada](#) has an excellent resource to help you plan a garden that will provide food, water and shelter for birds year-round. Use their [plant selector tool](#) to help choose plants that will thrive in your region.

Avoid Pesticides

Pesticides can harm and kill birds. Pesticides (including insecticides and rodent control poisons) can kill plants that birds rely on, kill or harm the insects that birds eat, and can accumulate in birds' bodies over time. Read more on [ABC Birds](#).

For gardening resources and tips, check out [Metro Vancouver's Grow Green Guide](#).

Bird Baths

Water – for drinking and for bathing – is essential for birds and other creatures. **Add a bird bath to your outdoor space** to help birds cool off in the summertime (make sure it is at least 1 metre away from untreated windows). The best bird baths are shallow (maximum 5 cm deep) and include dripping or running water. Add rocks and twigs for birds to stand on while they drink. Find more [bird bath tips from Cornell Lab](#). Don't forget to **clean your bird bath regularly** (ideally scrubbed once per week with a nontoxic soap).

Tip from BC SPCA: Poke a hole in a clean and empty milk jug, fill with water, and hang over your bird bath. The dripping water will attract birds! Make sure to keep it clean and refill the water every day or two.



Bird Feeders

The best way to create bird-friendly habitat in your outdoor space is to have varied vegetation that can offer natural food sources and shelter. With the exception of liquid hummingbird feeders, the [BC SPCA](#) recommends only using bird feeders from **October to March** when natural food sources are less available. If you're going to use a feeder in the winter months, be thoughtful about the kind of bird seed you use. Use only a small amount and **replace at least once a week** to avoid spoilage. Before replacing the food, **scrub the feeder clean**. For ideas on preferred foods by species, review [Audubon's Guide to Bird Seed](#) (a short and easy-to-read resource!). For detailed considerations, review [strategies recommended by the Canadian Wildlife Health Cooperative](#). They recommend creating a home recipe with fruit, berries, nuts and peanut butter.

Nectar in hummingbird feeders should be replaced every 2-5 days in the summertime. You can make your own nectar by boiling water and white sugar (do not use other kinds of sweeteners). [Find the recipe and learn about hummingbird feeder care](#) from the BC SPCA. In wintertime, make sure you keep it warm and protect it from freezing.

If you want to add a bird feeder to your outdoor space, you must, you must **keep it clean** and you should monitor for local disease outbreaks, which can put other birds and wildlife at risk (humans rarely catch illnesses from birds). [Birds can get sick](#) from the flu, conjunctivitis, and salmonella, among others. Follow updates from the [BC SPCA](#), who often release public recommendations to remove bird feeders during outbreaks. Learn more about strategies to reduce the spread of disease among wild birds by following the Canadian Wildlife Health Cooperative's [guidelines for monitoring and avoiding pathogens](#) in bird feeders. If you are committed to maintaining and monitoring a bird feeder, you can [learn here](#) about different feeder options.

Purchasing Decisions

You can support global bird-friendly habitats through your purchasing decisions. Migratory birds that spend their winters in tropical landscapes are impacted by habitat loss across different countries. Tropical forest loss, often caused by expanding agricultural frontiers, can also cause the loss of bird habitat. To meet global demand for coffee and chocolate, coffee and cacao farms are expanding into forests. Expanding farms leads to decreased tree canopy cover and decreased bird diversity.¹³

If you drink coffee or eat chocolate, consider purchasing [Smithsonian Bird-Friendly® certified products](#) to reduce harmful impacts on tropical bird habitat. Scientists have shown that certifications can have some effect on maintaining biodiversity (compared to non-certified farms).¹⁴ **Smithsonian Bird-Friendly® coffee and chocolate** ensure that farms maintain forest habitat, including native tree species.

In the Lower Mainland, you can find Smithsonian Bird-Friendly® coffee at [Wild Birds Unlimited](#) in North Vancouver, by ordering directly from the [Birds and Beans](#) (located in Ontario) or from [Café AVIA](#) (supports Nature Canada's Bird-Friendly city designation, located in Québec).

13. For understanding the impacts of cacao (chocolate) production on birds, see Bennett et al., 2020.

14. Hardt and colleagues (2015) studied certifications in general (and not the Bird-Friendly® certification in particular) to find that habitat and habitat connectivity for mammals was increased on certified farms.

Connecting with Birds



How to Deepen your Connection with Birds

There are lots of things you can do to deepen your connection with birds. The first step is to get outside! Listen to birdsong and watch the birds that share the environment around you.



Caption: Photos from May 5th Bird Walk at the UBC Botanical Garden for Biodiversity Days 2024. Photos by Terrell Roulston.

TRY BIRD WATCHING

Not sure where to start? There are lots of great apps you can download to your phone to help you find and identify birds by sight and by sound.

1. Check out [e-Bird Canada](#) – it is a collaborative project by [Birds Canada](#) and [Québec Oiseaux](#). You can upload your bird sightings to the e-Bird app or use it to find great new spots with lots of bird sightings.
2. Use the [MerlinID app](#) from [Cornell Lab](#) to record a birdsong and find out which bird is making that beautiful sound – but always confirm identification with a knowledgeable fellow bird watcher! You can also enter visual information about that gorgeous bird you saw and the app will offer identification suggestions. Visit the Cornell Lab to learn more about specific bird species.

Learn more by attending and participating in local events:

1. **Find a Nature Walk that is close to you.** Many regional and provincial parks organize guided Nature Walks – including bird walks. Find events in [Metro Vancouver parks](#).
2. You can also learn about birds by participating in the [Greater Vancouver Bird Celebration](#), which takes place every May in honour of the spring [World Migratory Bird Day](#) in the Americas. You can read more about World Migratory Bird Day across Canada [here](#).

Other places to visit and view birds around the Lower Mainland include:

- [Maplewood Flats](#), a Wild Bird Sanctuary in North Vancouver
- [George C. Reifel Migratory Bird Sanctuary](#) in Delta (must reserve visit in advance)
- [Alaksen National Wildlife Area](#) in Delta

GET INVOLVED IN COMMUNITY SCIENCE

Getting hooked on bird watching? Find a community science¹⁵ project to participate in. Birds Canada has a list of [all the opportunities](#) close to where you live. A great one to get started with is the **Great Backyard Bird Count**, which is a four-day bird count bonanza with global participation. It takes place in February every year; [learn more here](#). In the fall, FLAP Canada organizes the **Global Bird Rescue** to raise awareness about the danger of bird collisions with windows. [Find out how to participate.](#)



VOLUNTEER

Deepen your commitment to birds and bird habitat by volunteering with a local organization.

Wildlife Rehabilitator:

- [OWL \(Orphaned Wildlife Rehabilitation Society\)](#) (Delta)
[Wildlife Rescue](#) (Burnaby)

Join a Nature Club: Opportunities for Research, Education, and More:

BC Nature has a list of Nature Clubs across BC. For some active organizations in the Lower Mainland, see:

- [Vancouver Avian Research Centre](#)
- [Nature Vancouver](#) (consider volunteering for their [Birding Section](#))

Caretaking and Conservation Areas:

- [Maplewood Flats](#) (North Vancouver)
- [George C. Reifel Migratory Bird Sanctuary](#) (Delta)
- [Canada's Key Biodiversity Areas](#)
(which build on Canada's Important Bird Areas)
- [Canada's Important Bird and Biodiversity Areas](#)

15. Check out the Community Science toolkit in this ToolTree to learn more about participatory science.

Helpful Resources



Additional Resources:

For additional resources, check out the following organizations:

FLAP Canada : <https://flap.org/>

FLAP stands for Fatal Light Awareness Program. It is the pre-eminent authority on understanding and preventing bird collisions in Canada. Learn more about making buildings bird-friendly by exploring the resources on FLAP Canada's BirdSafe website (<https://birdsafeca.ca/>).

Birds Canada : <https://www.birdscanada.org/>

Learn about birds, participate in projects, and check out their gardening and bird-feeder resources - you can also find their podcast, The Warblers (<https://www.birdscanada.org/warblerspodcast>). Their stand-alone gardening webpage is <https://birdgardens.ca/>

Nature Canada's Bird Friendly City Certification: <https://naturecanada.ca/defend-nature/how-you-help-us-take-action/bfc/>

Find resources and learn about how Canadian municipalities are becoming bird-friendly!

American Bird Conservancy: <https://abcbirds.org/>

Learn about different bird species across North America and visit their "Solutions" page to learn more about what you can do to prevent negative impacts to birds.

Cornell Lab: <https://www.allaboutbirds.org/>

Learn about different bird species and how to ID them. Explore their maps and watch their Live Cam footage of nesting spots around the world.

City of Vancouver's Bird Strategy:

<https://vancouver.ca/parks-recreation-culture/vancouver-bird-strategy.aspx>

Learn about the places in the City of Vancouver that support birds and access a map-guide to the common birds of Vancouver.

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CITED SEEDS STUDENT APPLIED RESEARCH PROJECTS

Edwards, E., Forrest, D., Laird, M., & Zeng, A. (2021). Birds on UBC's campus: A mixed-method approach to prioritize bird species and assess habitat needs to inform policy & campus design. SEEDS Sustainability Program. [Student Report.](#)

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Bird-Friendly Toolkit also informed by SEEDS Student Applied Research Projects

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Eronen, E., Johnson, D., & Wan, K.M. (2022). Birds on campus: Assessing sources of unintentional feeding to inform policy and campus design – Understanding trash foraging practices in bird populations on the UBC Vancouver campus. SEEDS Sustainability Program. [Student Report.](#)

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- Nduna, N. (2023). Ecological connectivity in coastal British Columbia: How can we enhance habitat connectivity on the UBC campus and its adjacent ecosystems for the improvement of urban biodiversity? SEEDS Sustainability Program. [Student Report.](#)
- Newman, L., Lockyer, R., McConkey, S., Renard, S., & Gladstone, S. (2018). How does human activity impact bird song in the UBC Botanical Gardens? SEEDS Sustainability Program. [Student Report.](#)
- Porter, A., & Huang, A. (2015). Bird Collisions with Glass: UBC pilot project to assess bird collision rates in Western North America (Phase 2). SEEDS Sustainability Program. [Student Report.](#)

**Thank you for reading! We hope you found
the research summarized in this Toolkit useful.**

**Please email seeds.info@ubc.ca
for any questions or comments.**