

BIODIVERSITY DESIGN GUIDELINES

SIGNAGE & COMMUNICATIONS



8

Context

An important aspect of biodiversity conservation is raising awareness of the city's biodiversity, the benefits associated with it, and actions the city is taking to manage biodiversity and increased resilience to climate change and other threats. This information can be integrated into overall communications strategies and support biodiversity conservation across the City.

The City of Surrey has well-developed strategies and guidelines for communications, including signage and graphic design standards. This module complements existing approaches by providing guidance relating to biodiversity-targeted messaging, particularly signage, that can be integrated into overall communications strategies and implemented with city planning and development activities across the city.

Key Considerations

Biodiversity and biodiversity-related concerns, including climate change, can be perceived as being distant and future-oriented, and therefore may not be considered pressing by an audience. Communications must go beyond education and awareness to be effective. Considerations for biodiversity-targeted signage and communications include:

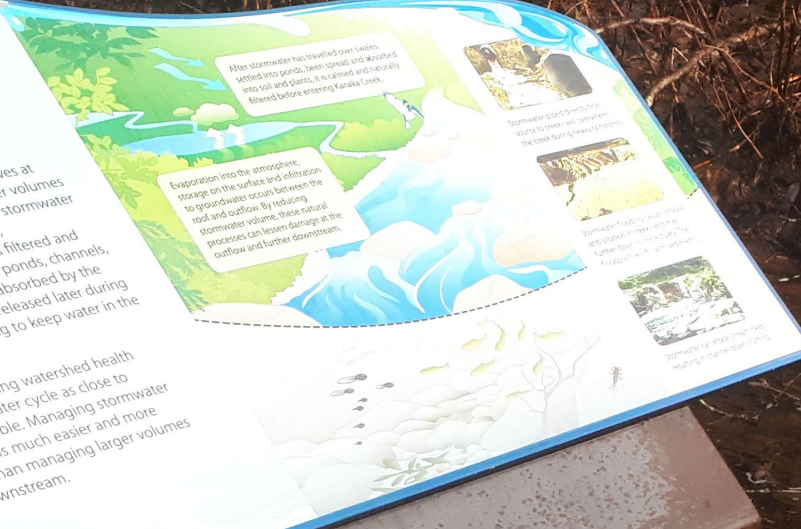
- ☑ Ensure communications are relevant to the audience, employ easily understood language that is memorable and elicits a positive response.³
- ☑ Focus messaging within key biodiversity themes: protecting biodiversity; importance of natural assets; encouraging appreciation of local species and ecosystems and solutions e.g., “what you can do”.
- ☑ Emphasize biodiversity conservation at a local, rather than regional, scale and frame messaging using local knowledge and issues.

Stormwater Meets Kanaka Creek

Cleaner, gentler flow,
than piped stormwater

Here, stormwater from the roofs arrives at Kanaka Creek cleaner and in smaller volumes compared with piped water. This stormwater is now like water from a natural, undeveloped site because it is filtered and slowed through landscaped ponds, channels, plants and soil. Rainwater absorbed by the ground will be naturally released later during the dry summer, helping to keep water in the creek year-round.

The key to protecting watershed health is keeping the water cycle as close to natural as possible. Managing stormwater natural at the source is much easier and more affordable than managing larger volumes further downstream.



Kanaka Creek Signage

Credit: MVRD

Signage should be place-based and focus on associated biodiversity values and features of a specific place wherever possible.

- ☑ Discuss biodiversity (and climate change) as more of an imminent concern than a future risk.
- ☑ Adapt messaging to different audiences and prioritize messaging to those who are more likely to take action. This includes audiences who are disengaged but might consider taking more positive actions if enough of the right

information were provided.

- ☑ People are more likely to take action to avoid a loss rather than make a gain, but messages should be framed in a positive manner. For example, “By protecting wetlands now, we will avoid losing many of the benefits, such as flood protection, provided by nature”.
- ☑ Incentivize stewardship of our natural areas by encouraging audiences to appreciate and take pride in the city’s biodiversity and the benefits it provides.

RECOGNIZE THE VALUE OF NATURE

Biodiversity is generally defined as the variety of organisms and ecosystems. Important in its own right, biodiversity also provides important services that benefit people. Referred to as ecosystem goods and services, they include the provision of food, pollination, carbon storage, maintenance of water and air quality, flood protection, material goods, recreation opportunities, and community health and well-being. These benefits are “free” and can far out-weigh the costs of engineering and maintaining the artificial infrastructure needed to recreate them. Biodiversity loss impacts the integrity and resiliency of our natural assets, compromising or diminishing the services they provide. Threats to biodiversity are primarily human-driven and include habitat loss, fragmentation, and degradation; species exploitation; invasive species; pollution; and more recently, climate change.^{1,2}

Relevant Surrey Documents:

- Biodiversity Conservation Strategy (2014)
- Official Community Plan (2013)
- Park Design Guidelines (2020)
- Exterior Sign Standards (2016)
- Graphic Standards Guide (2016)

ICON LEGEND:



Cost Legend: Relative Cost: \$ (low), \$\$ (medium), and \$\$\$ (high).

Module linkages:



Biodiversity-Focused Signage

Biodiversity-focused signage can be designed with different objectives in mind. For example, signs may be intended to provide information on the natural history of an area or to identify certain plants and wildlife that may be present. Some signs may be intended to raise awareness and manage behaviour. For example, the presence of bears or giant hogweed in an area may require a cautionary warning to trail users, whereas the presence of sensitive habitat or nesting birds may require signs that clearly indicate year round or seasonal access restrictions. Signs also provide directional information to visitors to help navigate trails and parks so that they can discover, enjoy, and learn about the City's natural areas and biodiversity.

The City of Surrey has developed standards for park interpretive signs, trail signs, and information kiosks. These standards are meant to maintain quality control and design consistency to reinforce a strong brand, positive City image, and improve effectiveness. Typically the standards refer to the colour, size, and type of materials to be used. The content (i.e. what is the sign trying to say?) will vary depending on the objectives and the biodiversity values. This section provides some guidance specific to biodiversity-focused content for signage, in addition to some different examples to illustrate how signage can be used to suit different management objectives.

Design Guidelines:

- ☑ Grab the audience's attention with interesting titles that indicate a biodiversity theme.
- ☑ Keep it simple. Limit text in the main body to a couple paragraphs with 3 to 4 sentences each. Add short captions to support the graphics.
- ☑ Target different audiences with your messaging. Some visitors may only read the title, some may only look at the graphics, some may read a few sentences, and some may read the whole sign. Key take away messages can be developed in association with individual elements (e.g., graphics, title, captions, text) of the sign to target these different audiences.
- ☑ Ensure the sign is compatible with the site.

Focal Guilds and Species: All.

Where to Implement: Trailheads, environmentally sensitive areas, habitat restoration areas, locations with unique or valuable opportunities to raise awareness of biodiversity.

What to Know:

- ☑ Graphics are important. Some visitors will only look at graphics; therefore, the graphics should be able to stand alone to deliver the message.
- ☑ Keep signs to a minimum and locate only where necessary to inform visitors of biodiversity values and associated risks.

Welcome to Mud Bay Park

The meadow might seem quiet, but it is an active hunting ground for raptors!

See migratory birds as well as year-round residents like the Great Blue Heron

Hundreds of species of birds can be spotted in this area.

What critters might be living in the salt marsh?

Share your photos with **#mycityofsurrey** or send to stewardship@surrey.ca for a chance to be featured on our social media channels

Be a citizen scientist! Share what you find on **iNaturalist**

A

Preserve Surrey's biodiversity.

Keep invasive plants out of parks.
Dispose of yard waste in your organics cart.

Surrey Parks

B

Surrey Bend
Big, Beautiful and Watery

...a landscape continually shaped and reshaped by the Fraser River.

qʷta:yθən

qʷta:yθən

C

- A - Sensitive Nesting Area Signage examples from Mud Bay Park, City of Surrey - Credit: City of Surrey
- B - Signage example from Surrey Parks - Credit: City of Surrey
- C - Signage example from Surrey Bend Regional Park, Metro Vancouver - Credit: Metro Vancouver Regional Parks

COMMUNICATING BIODIVERSITY

An effective communications strategy is essential to raise awareness and celebrate urban biodiversity. Biodiversity-focused signage is one way to communicate and support the City's conservation efforts, nature interpretation programs, and other related activities. However, online strategies including dedicated websites and web portals can also be used to communicate biodiversity-focused information to a wide and diverse audience.

Biopolis is an initiative by the non-profit World Wildlife Foundation (WWF) to showcase and raise awareness of urban biodiversity. First launched in the City of Montreal, the program was expanded to include Quebec and to highlight other projects across the country. Biopolis is a resource hub that brings together citizens, scientists, corporations, and communities to share knowledge and expertise. The Biopolis platform examines a range of biodiversity topics including: best practices and innovation; ecosystem services; education and awareness; green infrastructure, habitats, and connectivity; invasive species; soil; water; and urban agriculture.

DID YOU KNOW?

The United States National Wildlife Federation (NWF) encourages the creation of wildlife habitat gardens through its own certification program. Homeowners can apply for certification by verifying that their yard, balcony, garden, or landscape provides the essential habitat features necessary to support neighbourhood wildlife: food, water, cover, and places to raise young, in addition to using sustainable practices. Certification provides benefits including discounts on merchandise to support backyard biodiversity and a Certified Wildlife Habitat sign.⁸

FURTHER READING:


*The Gifts of Interpretation: Fifteen Guiding Principles for Interpreting Nature and Culture.*⁵

*BC Ministry of Forests Recreation Manual.*⁶


BATS NEED YOUR HELP!

Bats use their voices to find their way in the dark. They navigate and hunt by tracking the echo of their calls. Many bats echolocate at such a high pitch we can't hear them. But we can hear some bats call and we can record where and when we hear them as a way to better understand the secret lives of bats.


PRESS THE BUTTONS BELOW TO HEAR SOME BAT SOUNDS!



PALLID BAT
Antrozous pallidus



HOARY BAT
Lasiurus cinereus



SPOTTED BAT
Eptesima maculatum

BATS ARE SPECIAL AND WE NEED THEM
There are many kinds of bats — more than 1000 different species around the world! Bats consume mosquitoes and other insects that we consider pests. One study estimates that bats provide \$3.7 billion annually in pest control services to the United States.

BATS ARE IN TROUBLE
The fungal bat disease known as White-Nose Syndrome doesn't affect people or pets but has killed millions of bats across North America.

THERE ARE OTHER PROBLEMS TOO
Many bats fly into wind energy turbines for reasons we don't fully understand. Also, bats depend on clean water and insects for food and they are at risk from pesticides.

HARD TO FIND, HARDER TO CATCH, BUT EASY TO HEAR
Some of the rarest and least understood bats make low pitch calls that we can hear. This creates an opportunity. Join us in our search for these special animals!

How can you help? You can help us listen for bats. Become a community-scientist for bat conservation! Scan the QR-code to the right using your smartphone camera or visit osuscascades.edu/HERS/northwestern-bat-hub for more information!



A



CERTIFIED WILDLIFE HABITAT

FOOD • WATER • COVER • PLACES TO RAISE YOUNG

This property is recognized for its commitment to sustainably provide the essential elements of wildlife habitat. nwf.org/garden

B

ACCIDENTAL ARCHITECTS

Douglas squirrel (*Tamiasciurus douglasii*)

Forest creatures are busy preparing for winter. Can you spot a squirrel caching (hiding) a cone or mushroom to eat later?

Just like you might stock a pantry, Douglas squirrels cache food all over the forest. Sometimes they cache more than they can eat — this helps grow our urban forest as uneaten tree cones may sprout into new trees! Cached mushrooms help to spread beneficial fungi to other parts of the forest.



Photo by K. Calman
Douglas squirrels hang mushrooms to dry.



Squirrels munch on tree cones like corn-on-the-cob!



Eastern grey squirrel at a squirrel-proof birdfeeder.

C

A - Interactive Bat Conservation Signage - Credit: National Parks Service
 B - Certified wildlife habitat signage - Credit: National Wildlife Federation (NWF)
 C - Squirrel caching sign - Credit: City of Surrey

8.1 WILDLIFE WARNING SIGNS

Biodiversity-focused signage is often used for natural areas interpretation, but can also be used to mitigate human-wildlife conflicts. For example, warning signs to alert motorists of the potential presence of animals crossing a road are common on highways. Standard warning signs are seen as low cost mitigation approaches, but have generally been considered ineffective. This is particularly true in urban areas where drivers often travel the same routes becoming habituated to conditions, resulting in signs being ignored altogether.⁹ This section summarizes different types of wildlife warning signs, including non-standard designs, which may be considered within the City of Surrey and can potentially be integrated into road crossings.

8.1.1 STANDARD WARNING SIGN

Warning signs are placed at roadsides to reduce wildlife-vehicle collisions by alerting motorists of the potential presence of wildlife on roads.

Design Guidelines:

- ☑ Incorporate consistent, high contrast colours that are visible day and night.
- ☑ Consider using reflective paint.
- ☑ Avoid using text for vehicular signage.
- ☑ Only put signage at key locations. Not every crossing deserves a sign.

- ☑ Use temporary signage where wildlife-vehicle collisions are associated with seasonal movements (i.e. amphibian migrations).

Focal Guilds and Species:



Where to Implement: : GIN road crossings; Identified wildlife crossings; Wildlife collision hotspots.

What to Know:

- ☑ Majority of studies have shown standard warnings signs to be non-effective. Signs do not affect wildlife behaviour.
- ☑ Signs are usually erected at collision hotspots and may not indicate where wildlife successfully crosses roads.

FURTHER READING:

Wildlife Warning Signs and Animal Detection Systems.¹⁰



A



B

A - Newt Crossing Sign - Credit: Jimmy Allen

B - Wildlife Habitat Signage, Pacific Spirit Park - Credit: Rebecca Anderson

8.1.1 ENHANCED WILDLIFE WARNING SIGN

Enhanced wildlife warning signs provide additional visibility to motorists by including enhancements such as lights, larger size, motion sensors, and eye-catching imagery or text. They can be temporary to coincide with higher risks of wildlife-vehicle collisions and can be programmed to change.

Design Guidelines:

- ☑ Consider implementation of Animal Detection Systems (ADS) at large mammal crossing hot spots if fencing and under/overpass options are not feasible.
- ☑ Consider signage for “unseen” species, such as those using underpasses and culverts, to promote biodiversity awareness.

Focal Guilds and Species:



Where to Implement: Identified wildlife crossings; wildlife collision hotspots; GIN road crossings (consider signage for pedestrians, cyclists, and home-owners where the GIN intersects with highly urbanized areas).

What to Know:

- ☑ Signage should be different than other road signs and be combined with strategies that are more difficult to ignore, such as motion detection-triggered lights and pavement changes, to counter driver habituation.
- ☑ Temporal warning signs have been shown to have a 9-50% reduction in collisions.
- ☑ Animal Detection Systems (ADS) use motion-detection sensors that alert motorists of wildlife presence. They have been shown to reduce collisions with large mammals by 33-97%.
- ☑ ADS is only applicable to large mammals and reliability is dependent upon environmental conditions (e.g., high wind, precipitation, temperature) and other variables. Cost can be comparable to more traditional fenced and tunnel options due to installation and maintenance costs.
- ☑ A variety of systems are available, and a one-size-fits all system does not exist.

FURTHER READING:

Wildlife Warning Signs: Public Assessment of Components, Placement and Designs to Optimise Driver Response.⁹



A



B



C

A - Animal Detection System (ADS) - Credit: BC Ministry of Transportation and Infrastructure
 B - Animal Detection System (ADS) - Credit: BC Ministry of Transportation and Infrastructure
 C - Temporal warning sign, Coquitlam - Credit: Pamela Zevit

SIGNAGE MATERIALS

The City of Surrey Exterior Sign Standards (2016) provides some guidance on materials that can be used for different types of signs. The BC Ministry of Forests Recreation Manual (2000) provides additional guidance for materials that may be considered for interpretive sign panels, with consideration of cost, application, and location.

MATERIAL	RELATIVE COST	MAINTENANCE & AVERAGE LIFE	BEST USED	PROS	CONS
<p>ALUMINUM, anodized Aluminum plates with black or coloured images etched into surface</p> <ul style="list-style-type: none"> Can reproduce text, colour photos and line illustrations 	<ul style="list-style-type: none"> Low 	<ul style="list-style-type: none"> Low 10 years 	<ul style="list-style-type: none"> Where signs are replaced often Where hard to vandalize Where light weight is important 	<ul style="list-style-type: none"> Light weight Some processes can show many colours (e.g., photos) Inexpensive to produce 	<ul style="list-style-type: none"> Easily damaged by scratches and extreme heat
<p>ALUMINUM OR BRONZE, cast</p> <ul style="list-style-type: none"> Cast to produce a three-dimensional effect May be painted Can reproduce text and line illustrations 	<ul style="list-style-type: none"> High 	<ul style="list-style-type: none"> Low 20+ years Convey an image of permanence 	<ul style="list-style-type: none"> For 3-D lettering or images Memorial or dedication plaques 	<ul style="list-style-type: none"> Durable, paintable, 3 dimensions 	<ul style="list-style-type: none"> Cannot reproduce full colour photos Very expensive
<p>CEDAR, carved or routed</p> <ul style="list-style-type: none"> Thick wooden signs Part or all may be painted Can include text and colour illustrations 	<ul style="list-style-type: none"> Low/ Mod/ High 	<ul style="list-style-type: none"> High 15 years 	<ul style="list-style-type: none"> Entrance & trail head Where rustic look is required 	<ul style="list-style-type: none"> Can be inexpensive (esp. if done in-house) 	<ul style="list-style-type: none"> Easily damaged Require yearly mainten. Cannot reproduce full colour photos
<p>FIBERGLASS</p> <ul style="list-style-type: none"> Consist of colour photographs embedded in multiple layers of ultraviolet resistant resins – can include text, photos and illustrations 	<ul style="list-style-type: none"> First originals are high Copies are relatively low 	<ul style="list-style-type: none"> Low 10-15 years 	<ul style="list-style-type: none"> Where high quality images needed High vandalism areas 	<ul style="list-style-type: none"> High quality colour images Vandal and weather resistant 	<ul style="list-style-type: none"> Originals are expensive to produce Can be scratched, & damaged by flame
<p>PORCELAIN ENAMEL</p> <ul style="list-style-type: none"> Consist of steel bases with a porcelain enamel coating Can reproduce full colour images, including text, photos and illustrations 	<ul style="list-style-type: none"> High 	<ul style="list-style-type: none"> Low 10-20 years 	<ul style="list-style-type: none"> High use and high vandalism areas 	<ul style="list-style-type: none"> Most vandal and weather resistant material available 	<ul style="list-style-type: none"> Some colours poor reproduction Will rust if chipped Expensive to produce or replace
<p>PLYWOOD, painted or silk-screened</p> <ul style="list-style-type: none"> Can accommodate text, photos and illustrations 	<ul style="list-style-type: none"> Low 	<ul style="list-style-type: none"> Low 5-10 years 	<ul style="list-style-type: none"> For low budget & local production 	<ul style="list-style-type: none"> Inexpensive to produce or replace Can be locally produced 	<ul style="list-style-type: none"> Difficult to repair, often damaged by porcupines
<p>VINYL DECALS (soft vinyl)</p> <ul style="list-style-type: none"> Decal-on-decal layering permits economical production of one-off signs 	<ul style="list-style-type: none"> High 	<ul style="list-style-type: none"> Low 5-7 years 	<ul style="list-style-type: none"> One-off signs Reflective material available 	<ul style="list-style-type: none"> Consistent quality 	<ul style="list-style-type: none"> Not repairable Require metal or wood backing

REFERENCES

- ¹ Rands, Michael R. W., et al. "Biodiversity Conservation: Challenges beyond 2010." *Science*, vol. 329, no. 5997, 9 Sept. 2010, pp. 1298–1303, 10.1126/science.1189138.
- ² The Nature Conservancy. "Biodiversity: Nature by Another Name." The Nature Conservancy, 30 Oct. 2019, www.nature.org/en-us/what-we-do/our-insights/perspectives/biodiversity-crisis-nature-underpins-human-existence/.
- ³ Ryan, John, et al. *Communicating Biodiversity & Climate Change*. Ontario Biodiversity Council, Aug. 2017.
- ⁴ World Wildlife Fund. "BIOPOLIS - Urban Biodiversity Projects." WWF.CA, wwf.ca/biopolis/. Accessed 21 Feb. 2021.
- ⁵ Beck, Larry, and Ted T Cable. *The Gifts of Interpretation : Fifteen Guiding Principles for Interpreting Nature and Culture*. Urbana, Sagamore Publishing, 2015.
- ⁶ British Columbia Ministry of Forests. "BC Ministry of Forests, Recreation Manual." [Www.for.gov.bc.ca](http://www.for.gov.bc.ca), Dec. 2000, www.for.gov.bc.ca/hfp/publications/00201/. Accessed 21 Feb. 2021.
- ⁷ Arboriculture International. "Environmental — Arboriculture International | Tree Preservation ISA Arborist Care." Arboriculture International, 2015, www.arboriculture.international/environmental-1#environmental. Accessed 21 Feb. 2021.
- ⁸ National Wildlife Federation. "Certify - Garden for Wildlife | National Wildlife Federation." National Wildlife Federation, 2019, www.nwf.org/Garden-For-Wildlife/Certify.aspx. Accessed 29 Mar. 2019.
- ⁹ Bond, Amy, and Darryl Jones. "Wildlife Warning Signs: Public Assessment of Components, Placement and Designs to Optimise Driver Response." *Animals*, vol. 3, no. 4, 17 Dec. 2013, pp. 1142–1161, 10.3390/ani3041142. Accessed 2 Oct. 2020.
- ¹⁰ Huijser, Marcel P., et al. "Wildlife Warning Signs and Animal Detection Systems Aimed at Reducing Wildlife-Vehicle Collisions." *Handbook of Road Ecology*, 24 Apr. 2015, pp. 198–212, 10.1002/9781118568170.ch24. Accessed 20 Feb. 2021