

Environmental Guidelines for Urban and Rural Land Development in British Columbia



Glossary

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Alien species: plants, animals and micro-organisms from one part of the world that are transported beyond their natural range and become established in a new area. They are sometimes also called ‘exotic’, ‘introduced’, ‘non-native’, or ‘non-indigenous’ species. Some alien species are also invasive. These are the species that are of concern.

Appropriately qualified professional: a scientist or technologist specializing in a relevant applied science or technology including, but not necessarily limited to, agrology, forestry, biology, engineering, geomorphology, geology, hydrology, hydrogeology, or landscape architecture. This person must be registered with his or her appropriate professional organization in British Columbia, must act under that association’s Code of Ethics, and must be subject to disciplinary action by that association. The professional who, through demonstrated suitable education, experience, accreditation, and knowledge relevant to the subject matter, may be reasonably relied on to provide advice within his or her area of expertise. (See also qualified environmental professional, as defined in the Riparian Areas Regulation.)

Aquatic ecosystem: any body of water, such as a stream, lake, estuary, or wetland, and all of the organisms and non-living components within it functioning together as a natural system.

Biodiversity: the variety of life on earth in all its forms including genes, species, and ecosystems and the natural processes that link and maintain them.

Blue-listed: any native species, subspecies, or community that is considered to be Vulnerable (Special Concern) in British Columbia. These species are of concern because of characteristics that make them particularly sensitive to human activities or natural events. Blue-listed species are at risk but are not Extirpated, Endangered or Threatened.

Brownfields: lands that have been previously developed and are now being redeveloped. This includes former industrial lands that may be contaminated or may have been remediated.

Buffer: an area of land that surrounds and protects an Environmentally Valuable Resource from the adverse effects of activities on, or encroachment from, adjacent land.

Carbon sequestration: the long-term storage of carbon or carbon dioxide (CO₂) in forests, soils, oceans, or underground in depleted oil and gas reservoirs, coal seams, and saline aquifers. Examples of carbon sequestration include the direct removal of CO₂ from the atmosphere through land use change, afforestation, reforestation, ocean fertilization, and agricultural practices to enhance soil carbon.

Carbon sink: natural or human-made systems that absorb CO₂ from the atmosphere and store it. Trees, plants, and even oceans absorb CO₂ and, therefore, are carbon sinks.

Climate change: Any change in climate over time, whether due to natural variability or as a result of human activity.

Climate mitigation: actions to reduce the amount of greenhouse gases being released into the environment.

Climate adaptation: adjustments in natural or human systems in response to actual or expected climatic stimuli or their effects.



- Coarse woody debris:** sound or rotting logs, stumps, or large branches that have fallen or been cut and left on the ground.
- Coastal ecosystem:** an ecosystem that exists along the interface of tidal salt water and the adjacent upland area. Examples of coastal ecosystems include shorelines, estuaries, and salt marshes.
- Coastal squeeze:** a term describing the loss of habitat that occurs when there is a fixed landward boundary (such as a seawall) but rising sea levels and increased storminess push the sea boundary inland.
- Conservation covenant:** a voluntary, written legal agreement in which a landowner promises to protect his or her land in specified ways. The covenant is attached to the title of land and binds future landowners to the terms of the covenant.
- Contaminated site:** an area of land in which the soil, water, ground water, or underlying sediment contains harmful substances in quantities or concentrations that exceed specified criteria, standards, or conditions.
- COSEWIC:** Committee on the Status of Endangered Wildlife in Canada.
- Critical habitat:** the habitat that is necessary for the survival or recovery of a listed wildlife species and which may be identified as the species' critical habitat in the recovery strategy. Critical habitat may be legally identified by the federal government (Species at Risk Act, 2[1]).
- Deleterious substance:** any substance that, if added to water, would degrade or alter the quality of the water such that it damages fish or fish habitat or becomes unsuitable for human consumption or any other purpose for which it is legally licensed (such as irrigation and livestock watering).
- Disposal Rate:** Per capita disposal rate is an estimate of how many kilograms of solid waste one person sends to a landfill or other disposal site in a given year. It does not include waste that is reused or recycled.
- Due diligence:** the level of judgment, care, prudence, determination, and activity that a person would reasonably be expected to undertake under certain circumstances.
- Ecological integrity:** the quality of a natural ecosystem in which the natural ecological processes are sustained, with genetic, species, and ecosystem diversity assured for the future. Ecological integrity occurs when an area or network of areas supports biological diversity, natural ecosystem composition, structure and function, and a capacity for self-renewal.
- Ecological community:** The B.C. Conservation Data Centre (CDC) and NatureServe network use this term to capture the full range of ecosystems in B.C. at a variety of levels. The term "ecological" is a direct reference to the integration of non-biological features such as soil, landform, climate and disturbance factors. The term "community" reflects the interactions of living organisms (plants animals, fungi, bacteria, etc.), and the relationships that exist between the living and non-living components of the "community".



Ecosystem: a complete system of living organisms interacting with the soil, land, water, and nutrients that make up their environment. An ecosystem is not complete without three elements: composition, structure, and function. The composition includes the pieces that make up the ecosystem (e.g., species); structure refers to the physical and spatial aspects of an ecosystem; and function is about natural processes such as fire, floods, insect outbreaks and windthrow that shape it. An ecosystem can be any size—a log, pond, field, forest, or the earth’s biosphere—but it always functions as a whole unit. Ecosystems are commonly described according to the major type of vegetation—for example, old-growth forest or grassland ecosystem.

Ecosystems at risk: ecosystems that are Threatened or Endangered.

Ecosystem features: the physical components of the ecosystem (such as snags and coarse woody debris) that help maintain the diversity and processes associated with a healthy ecosystem.

Ecosystem functions: the physical, chemical and biological processes that keep an ecosystem operating. Examples include infiltration of surface water, evapo-transpiration and nutrient cycling.

Edge habitat: the point at which dissimilar plant communities (different vegetation types, successional stages, or vegetative conditions) meet. Many species have adapted to the interface between the adjoining habitats.

Edge species: species that are adapted to living at the edge between two habitats, utilizing both for food and/or shelter, e.g., forest and grassland.

Emergent aquatic vegetation: vascular plants that grow with their roots and lower stems in water and their leaves and flowers above the water surface. Cattails and bulrushes are common emergent aquatic plants.

Endangered: a species designated by COSEWIC as facing extirpation or extinction if limiting factors are not reversed.

Environmental monitoring: the processes and activities that need to take place to characterize and monitor the quality of the environment.

Environmentally Valuable Resource: all features, places, and species whose presence enhances the biodiversity of the area. Environmentally Valuable Resources range in size from small patches to extensive landscape features, and can include rare or common habitats, plants and animals. These areas require special management attention to protect fish and wildlife resources, other natural systems or processes, and/or historical, cultural, or scenic values.

Erosion: the displacement of solids (soil, mud, rock, and other particles) by the agents of wind, water, ice, movement in response to gravity, or living organisms. Erosion is an intrinsic natural process, but in many places it is increased by poor land use practices include deforestation, overgrazing, and unmanaged construction activity. When particles from erosion enter water bodies, the sediment can cause problems by clogging fish gills, burying fish-spawning gravels, filling reservoirs with sediment, and reducing water quality.

Ephemeral: seasonal. Usually in reference to a watercourse that does not flow year-round, or a wetland that is dry in summer months.



Estuary: a partially enclosed body of water freely connected to the ocean within which sea water is diluted by mixing with freshwater and where tidal fluctuations affect stream water levels. The estuary is a dynamic system typified by brackish (mixed fresh and salt) water, variable and often high nutrient levels, and shallow water conditions. Marsh plants typically grow in an estuary's upper tidal zone, and eelgrass often grows in its lower tidal zones.

Extended Producer Responsibility (EPR): Also known as industry-led product stewardship, EPR is a market-based policy that requires producers (manufactures/sellers) of designated products to take full life-cycle management of their products, including collection and recycling. This policy places the responsibility and associated costs for end-of-life product management on the producers and consumers of products and not the general taxpayer or local government. EPR programs exist under the Recycling Regulation.

Extirpation: local extinction. The species no longer exists in the wild in that area although it still occurs elsewhere.

Feathering: a method of partially trimming trees so that they are windfirm (better able to resist windthrow).

Forb: a herbaceous plant with broad leaves, excluding the grasses and grass-like plants (e.g., buttercup, sunflower)

Forest interior species: bird species which nest only within the interior of a forest.

Fragmentation: a process whereby large contiguous ecosystems are broken up into one or more smaller patches surrounded by disturbed areas.

Greenfield: sites that have not previously been used for urban or rural land development.

Greenhouse gas: gases in the earth's atmosphere that absorb and re-emit infrared radiation. These gases occur through both natural and human-influenced processes. Greenhouse gases emitted through human activities include carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF₆).

Green procurement: the acquisition of products and services with a lesser or reduced effect on human health and the environment (when compared with competing products or services that serve the same purpose)—e.g., the purchase of recycled paper rather than virgin paper. A green product is one that is less harmful than the next best alternative.

Greenways: networks of linked greenspace that provide wildlife habitat and recreational opportunities. Some greenways include trails; others do not provide public access. On the ground, greenways are created as part of an integrated approach to land planning, balancing the needs of human communities and natural systems.

Greyfields: aging strip malls and shopping centres that are being redeveloped. Typically these sites have extensive asphalt areas but no major contamination issues such as brownfield sites may have.



Groundwater: water that moves through the soil and underlying geological strata.

Groundwater recharge: the movement of rainwater down through the soil and into the ground water and aquifers beneath.

Habitat: the place where an organism lives, and/or the conditions of that place, including the soil, vegetation, water, and food.

Habitat refuge: a small patch of habitat that provides food, shelter and/or other needs for wildlife. Habitat refuges may include human-modified ecosystems, and generally are not large enough to maintain the genetic diversity of a population.

Habitat reservoir: a large area of relatively natural habitat that has sufficient size and ecological integrity to support a range of native species, including species that need interior habitats and those that are less tolerant of human presence. The size of the habitat reservoir depends on the species being managed. Habitat reservoirs are often hotspots of biodiversity in or near disturbed urban and rural landscapes.

Hazard areas: lands that may be subjected to terrain hazards (flooding, landslides, debris flows, avalanches, etc.).

Herb: a plant that has leaves and stems that die down at the end of the growing season to the soil level. They have no persistent woody stem above ground. Herbaceous plants may be annuals, biennials or perennials.

Heritage site: land, including land covered by water, which has heritage value to British Columbia, a community, or an aboriginal people; whether or not it has been designated under the Heritage Conservation Act.

Hibernaculum (plural: hibernacula): a sheltered place where an over-wintering animal rests, or a den where snakes hibernate.

High water mark: the visible mark left along the edge of a stream, wetland, lake, or other water body by the presence and action of high water levels in most years. The area below the high water mark includes the active floodplain.

Hydrology: the science of water, its properties, and movement (water cycle) over and under land surfaces.

Impervious surface: a surface that prevents water from going into the ground, such as roofs, roads, parking lots, and compacted soils.

Integrated pest management: a decision-making process that uses a combination of techniques to suppress pests, and which must include, but is not limited to, the following elements:

- (a) planning and managing ecosystems to prevent organisms from becoming pests



- (b) identifying potential pest problems
- (c) monitoring populations of pests and beneficial organisms, pest damage, and environmental conditions
- (d) using injury thresholds in making treatment decisions
- (e) reducing pest populations to acceptable levels using strategies which may include a combination of biological, physical, cultural, mechanical, behavioural, and chemical controls
- (f) evaluating the effectiveness of treatments

Interflow: the underground flow of water from where it enters the ground to an open water body (stream or lake).

Important Bird Area (IBA): An area recognized as being globally important habitat for the conservation of bird populations. The program was developed and sites are identified by BirdLife International. These sites are small enough to be entirely conserved and differ in their character, habitat or ornithological importance from the surrounding habitat.

Invasive species: plants, animals, and micro-organisms that colonize and take over the habitats of native species. Most invasive species are also alien (non-native) to the area and can become dominant because the natural controls (e.g., predators, disease) that kept their populations in check in their native environment do not occur in their new location.

Islandization: the process by which disturbance results in an ecosystem becoming isolated from surrounding similar ecosystems. The remnant ecosystem becomes an 'island' in a sea of development.

Ladder fuels: flammable materials (e.g., dry branches) that provide vertical continuity between ground fuels and the crowns of trees, and which contribute to the ease of a tree burning.

LEED™: Leadership in Energy and Environmental Design. The LEED Green Building Rating System™ is a voluntary, consensus-based national standard for developing high-performance, sustainable buildings.

Municipal solid waste: (a) refuse that originates from residential, commercial, institutional, demolition, land clearing, or construction sources, or (b) refuse specified by a manager to be included in a waste management plan.

Natural capital: the extension of the economic notion of capital (manufactured means of production) to goods and services relating to the natural environment. Natural capital is thus the stock of natural ecosystems that yields a flow of valuable ecosystem goods or services into the future.

Naturescape: a way of restoring, preserving, and enhancing wildlife habitat in urban and rural landscapes by providing wildlife habitat around our homes and in our gardens. See the Naturescape Web site for details.



Passerines: of or relating to birds of the order *Passeriformes*, which includes perching birds and songbirds such as the jays, blackbirds, finches, warblers, and sparrows.

Pesticide: materials that are used to prevent, destroy, repel, attract or reduce pest organisms. Insecticides, herbicides, fungicides and rodenticides are some of the more well-known pesticides. Pesticides also include growth regulators, plant defoliants, surface disinfectants, and some swimming pool chemicals.

Plant community: a unit of vegetation with a relatively uniform species composition and physical structure. A plant community also tends to have characteristic environmental features such as bedrock geology, soil type, topographic position, climate, and energy, nutrient, and water cycles.

Qualified environmental professional: an applied scientist or technologist who is registered in good standing with an appropriate professional organization and who acts under its code of ethics and is subject to its disciplinary action. The professional must be acting within their area of expertise. This term is a legal definition in the Riparian Areas Regulation. (See also appropriately qualified professional.)

Raptors: birds of prey, including hawks, owls, and eagles.

Red-listed: includes any native species, subspecies or plant community that is Extirpated, Endangered, or Threatened in British Columbia.

Remediation: covers all stages of contaminated site management from preliminary investigations through planning and implementation of remediation procedures to final monitoring.

Residence: in relation to a species at risk, the species' residence is a place or natural feature (or type of place or natural feature) that forms part of the habitat of that species and which is (a) habitually occupied or used as a dwelling place by one or more individuals of the species, or (b) considered as necessary for that occupation or use (Wildlife Amendment Act).

Restrictive covenant: a covenant between the landowner and the Province of British Columbia (and/or local government) which restricts certain activities on that land. The covenant is registered against the property title under section 219 of the Land Title Act.

Riparian assessment area: for a stream, the 30 metre strip on both sides of the stream, measured from the high water mark, (b) for a ravine less than 60 metres wide, a strip on both sides of the stream measured from the high water mark to a point that is 30 metres beyond the top of the ravine bank, and for a ravine 60 metres wide or greater, a strip on both sides of the stream measured from the high water mark to a point that is 10 metres beyond the top of the ravine bank (Riparian Areas Regulation).

Riparian ecosystem: the area adjacent to a stream which may be subject to temporary, frequent, or seasonal inundation. The area supports plant species that are typical of an area of inundated or saturated soil conditions and that are distinct from plant species on freely drained adjacent upland sites. The riparian ecosystem is influenced by, and exerts an influence on, the associated aquatic ecosystem.



- Risk:** the chance of something happening that will have an impact on the achievement of objectives.
- Seep:** an area where subsurface water is slowly discharged onto the land surface. Usually found on hillsides.
- Sensitive ecosystems:** rare and/or fragile ecosystems that have been identified during a Sensitive Ecosystems Inventory.
- Soil morphology:** the form and structure of the soil, including its mineral and biological (dead organic matter) content.
- Snag:** a standing dead tree.
- Special Concern:** a species that is designated by COSEWIC as particularly sensitive to human activities or natural events but has not yet been designated as an Endangered or Threatened species.
- Species at risk:** a species that has been defined as 'at risk' [of extirpation] by either the federal or provincial government.
- Federally listed:** The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) maintains a list of species that are designated as Extirpated, Endangered, Threatened, or of Special Concern. Those species listed by the Species at Risk Act are protected on federal lands.
- Provincially ranked:** The British Columbia government maintains a ranking of species considered to be Red-listed, Blue-listed, and Yellow-listed in the province. Yellow-listed species are not at risk. Species at risk can be listed under the Wildlife Amendment Act 2004.
- Spiral pruning:** a technique for pruning trees that removes some limbs from the upper portion of the tree, leaving it more windfirm.
- Streamside Protection and Enhancement Area:** an area (a) adjacent to a stream that links aquatic to terrestrial ecosystems and includes both existing and potential riparian vegetation and existing and potential adjacent upland vegetation that exerts an influence on the stream, and (b) the size of which is determined on the basis of an assessment report provided by a qualified environmental professional in respect of a development proposal (Riparian Areas Regulation).
- Threatened:** a species that is designated by COSEWIC as likely to become Endangered if limiting factors are not reversed.
- Timing windows:** periods when human activities are least likely to cause damage to species and ecosystems.
- Top of bank:** the points closest to the natural boundary (or high water mark) of a watercourse where a break in slope occurs such that the grade beyond the break is flatter than 3:1 (horizontal: vertical) for a minimum of 15 metres measured perpendicularly from the watercourse. Small



slopes beyond the initial break in slope that are steeper than 3:1 but are less than 1 metre in height can be included in the determination of the 15 metre distance from the top of bank. Where banks are not well defined (e.g., in the case of lakes, wetlands, or ponds), the top of the bank is equivalent to the natural boundary or seasonal high water mark.

Urban forest: Sum total of all trees and their associated ecosystems, including understorey biota and soils, within an urban or rural community. Urban forest occurs on both public and private lands, including parks, boulevards, remnant ecosystems, residential yards, commercial and industrial lands, and open spaces.

Vadose storage: groundwater retained in the area between ground level and the top of the water table.

Vernal pool: a temporary body of freshwater that is filled by spring rains and snowmelt but which dries up during the summer or fall. Many vernal pools are filled again by autumn rains and may persist throughout the winter.

Water balance: the rainfall runoff volume from a given site. The Water Balance Model provides a way to study the precipitation on a given site, and how different rainfall intensities will be handled under post-development conditions. Ideally, the water balance will be very similar before and after development, with most of the rainfall infiltrated on site.

Watershed: an area of land that contributes runoff to a specific delivery point, such as the mouth of a river. Large watersheds may be composed of many smaller sub-watersheds, each contributing runoff to various streams and rivers that ultimately combine into a single entity.

Wetland: land that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support vegetation that is typically adapted to saturated soil conditions. Types of wetlands include swamps, marshes, bogs, fens, vernal pools, and salt water marshes.

Wildlife corridor: a travel corridor for wildlife. Wildlife corridors range from very wide, natural corridors for large mammals, to 'sky corridors' that offer a safe flight path between feeding and resting places for birds, to smaller man-made corridors (such as urban trails or culverts under roads) that provide safe passage for smaller creatures. These corridors also provide year-round habitat for less mobile species.

Wildlife tree: a standing live or dead tree with special characteristics that provide valuable habitat for wildlife. Characteristics include large diameter and height for the site, current use by wildlife, declining or dead condition, value as a species, valuable location, and relative scarcity.

Windthrow: a tree or trees uprooted or broken off by the wind. Also known as blowdown.

Xeriscaping: a landscaping approach using plant species that tolerate very low water conditions.

Yellow-listed: all species that are not included on the British Columbia Red or Blue Lists, as they are widespread or common and not threatened by diminishing numbers at this time.