

Habitat Loss & Degradation

What is habitat loss & degradation?

Natural habitats are the physical, chemical and biological systems that support living things (i.e. plants, animals, fungi and microbes). More simply put, habitats are the places where these organisms live. Habitat is lost and degraded when natural or human-caused activities alter these places so that fewer species can live there. For example, when a section of forest is cut down and replaced with farmland or urban spaces, the living places of hundreds of species may be eliminated.

Although natural events such as landslides and earthquakes do alter the landscape, they generally occur in isolated areas and healthy ecosystems are able to recover from them. Human-caused habitat loss, on the other hand, is altering ecosystems on a global scale, often causing destruction that is irreversible, at least on a time scale that is of interest to society.

Habitat loss is not only a concern from the point of view of compassion for other species that share this planet. Humans are part of the great cycle of life on earth, and as such we depend on the overall function of natural systems for our own survival. Properly functioning natural systems create the air we breathe, break down our wastes, provide our food, purify our drinking water and ultimately supply all the materials we require for living. Each species plays an important role in its ecosystem. Habitat loss and degradation is the main threat to the world's endangered plants and animals, and is occurring at ever greater rates.

Despite this sobering picture, habitat loss is not always an inevitable consequence of human activities. There are ways to limit our impact on natural systems, for example by using principles of "smart growth" in urban planning (see More Information). Nevertheless, major changes and efforts are required to address this critical problem.

How does habitat loss & degradation effect ecosystems?

Habitat can be lost or damaged in a number of ways. Direct damage occurs when habitats are physically altered, such as when a wetland is filled in or a shoreline is replaced with a seawall. Pollution can cause indirect damage by making an environment too toxic for all or certain species. Invasive species can alter the structure and chemistry of ecosystems and out-compete native species. Some of these causes and impacts are summarized in the table below.

One example illustrates the possible impacts of habitat loss and degradation. Estuaries and wetlands are among the most productive ecosystems in the world, and provide many services of direct benefit to people; for example, water filtration and storage, and protection from storm surges and erosion. The habitats of these ecosystems are diverse. Intertidal mud flats, submerged eelgrass beds and salt marshes in estuaries house a diversity of animals including worms,

crustaceans, shellfish, seabirds, shorebirds and waterfowl, fish (including commercially important species), seals, river otters, bears, raccoons and birds of prey. Wetlands host a similar diversity of freshwater species. Along with many microbe and plant species, these animals form a complex food web. Damage to or removal of one component of the food web can affect the function of the whole system.

Unfortunately, in many cases the value of estuaries and wetlands has been overlooked by people who have viewed them only as "waste" areas that could be diked, drained and filled in for agriculture, urban development or other more "useful" purposes. Close to 75% of the estuaries and wetlands present in the CRD at the time of European settlement have been lost.¹ Although our perception of the utility of these sensitive areas is slowly changing, the damage continues today. The results include increased erosion, storm surge and flood damage, degraded water quality, and decline or extinction of plants and animals. Habitats in estuaries and wetlands are also damaged by pollution and invasive species. When certain types of plants and animals are killed off from these effects, other species that depend on them also die off or, when possible, move to another area.

Estuaries and wetlands are not the only types of ecosystems threatened with habitat loss. In 1997, 61% of streams in the Lower Mainland were classified as endangered, 24% were threatened and only 15% were "wild."¹ Garry oak ecosystems, which support many rare and endangered species, were once common throughout southern Vancouver Island. They have now been reduced to isolated patches among urban and rural developments.

Habitat fragmentation occurs when previously connected habitat is split up by human developments such as urban areas, agricultural fields, logging and roads. This leaves smaller, isolated areas to be available for wildlife - in effect, habitat "islands." These islands have much more edge area exposed to stressors such as human disturbance, invasive species and pollution. Fragmentation interrupts the movements, foraging and hunting behaviours of many animals. People are coming to realize that isolated parks surrounded by human development are not sufficient to preserve wildlife. Rather, interconnected natural areas and wildlife corridors are needed.

With the population of the Georgia Basin/Puget Sound forecasted to exceed nine million people by 2020 (an increase from seven million in 2000), the problem of habitat loss is likely to get worse. After all, most modifications of natural areas by people degrades wildlife habitat to some extent. However, if urban growth is carefully planned and if people take on the challenge to reduce their impact on natural areas, habitat loss can be minimized.

Causes and impacts of habitat loss & degradation

Activity	Habitats Affected	Impacts To Habitats
<p>Shoreline armoring <i>("hard" structures such as seawalls, angular rock, jetties, etc, built to protect beaches and shorelines from erosion)</i></p>	<p>Intertidal and subtidal shorelines (See altered shorelines)</p>	<ul style="list-style-type: none"> • Loss of complexity and surface area • Depletion of sediment supply to adjacent areas (see coastal sediment processes) • Increased exposure to wave energy; fewer species can survive
<p>Fishing – bottom trawling <i>(large ships that drag weighted nets with rollers across the ocean bottom) 2</i></p>	<p>Subtidal and deep water marine areas</p>	<ul style="list-style-type: none"> • Physical destruction of bottom-dwelling plants/animals • By-catch (unmarketable fish species that are thrown away)
<p>Dredging <i>(excavation in marine or freshwater areas)</i></p>	<p>Subtidal , intertidal and freshwater habitats</p>	<ul style="list-style-type: none"> • Physical destruction of bottom-dwelling plants/animals • Smothering of bottom-dwelling organisms with displaced sediment • Fewer plants can grow in reduced light; fish gills become clogged with sediment
<p>Diking and in-filling</p>	<p>Estuaries ; shorelines; wetlands</p>	<ul style="list-style-type: none"> • Productive intertidal and wetland habitat is destroyed, replaced with ecologically less valuable land use • Decline of commercially important species
<p>Invasive Species</p>	<p>Shoreline, upland , freshwater habitats</p>	<ul style="list-style-type: none"> • Directly compete with native species for habitat, food • Alter structure of habitat; often create dense, unproductive monocultures
<p>Logging and vegetation removal</p>	<p>Upland , freshwater, marine habitats</p>	<ul style="list-style-type: none"> • Destroys structure of habitat; • Removes organic material necessary for soil replenishment; machinery disturbs soil • Can create erosion , which degrades water quality and causes further habitat loss; • Less large woody debris in streams alters flow and channel characteristics • Reduces natural infiltration of rainwater

Log booming (<i>storage of logs in lakes and sea ports</i>)	Lakes, sheltered marine habitats	<ul style="list-style-type: none"> • Accumulation of wood debris on the bottom of the water body smothers bottom-dwelling plants/animals • Chemical composition of substrate is altered • Decomposition of wood debris by bacteria depletes oxygen in water
Agriculture	Upland , marine, freshwater habitats	<ul style="list-style-type: none"> • Replacement of diverse habitats with single- species crops (loss of wildlife habitat) • Possible runoff of livestock wastes, pesticides, fertilizers, into freshwater and marine environments • Transformation of streams into drainage ditches (less valuable habitat)
Sewage, animal wastes and fertilizer pollution	Streams, wetlands, lakes, marine areas	<ul style="list-style-type: none"> • Nutrients cause explosive algae growth; decomposition of algae robs water of oxygen; "dead zones" created. • Heavy metals and pharmaceuticals in wastes affect health of aquatic organisms • Sediments in sewage/animal waste may bury bottom-dwelling organisms
Industrial and automobile pollution	All habitats	<ul style="list-style-type: none"> • Many substances are directly toxic to plants/animals; others have long-term cumulative effects on health • Heavily polluted areas become "dead zones" where few organisms can live.

How does habitat loss & degradation affect people?

People rely on natural habitats, even those of us who live in the city. Bees and other insects pollinate many of the crops we eat. Birds and bats eat insect pests that threaten the crops. Forests supply wood for our houses. Many people eat wild plants, fish and game. Our drinking water is purified by forests and wetlands. Bacteria break down our wastes. And many types of plants, bacteria and fungi help to cure disease and maintain health; the millions of species not yet discovered may prove to be invaluable for health and technology products. These functions are sometimes referred to as "ecosystem services," and although it is difficult to value them in monetary terms, some people are attempting to do just that, so that these functions are not taken for granted (see "ecosystem valuation" in More Information).

Natural systems are extremely complex and knowledge about how they function is quite limited. However, the importance of a wide variety of species, some of which perform apparently "redundant" functions, is beginning to emerge. Preserving natural habitat therefore preserves biodiversity, and acts like a "savings fund" for the earth and for our future needs.

Natural areas are also important to people as places for relaxation, recreation and spiritual peace. Tourists and visitors alike enjoy the natural beauty of B.C., where tourism and recreation make important contributions to the economy. For example:

- In 1998, tourism generated \$9.8 billion in provincial revenues, generated \$4.9 billion in provincial Gross Domestic Product (compared to \$6.8 billion from forestry) and supported 106,830 direct jobs.³
- In 1996, residents of B.C. spent \$1.9 billion to participate in outdoor activities in natural areas of the province; these activities contributed \$1.2 billion to the provincial GDP and sustained 34,100 jobs.⁴
- Although fisheries comprised a fairly small portion (0.5%) of the provincial GDP in 2001, sports fishing was by far the largest fisheries sector.⁵

How Can I Help Reduce Habitat Loss & Degradation?

An important first step in preserving habitats is to identify them. Technologies such as satellite imagery, global positioning systems (GPS), geographical information systems (GIS) and remote sensing aid this task, and allow people to create many different types of maps. Maps can show where species and habitats are located, so that local residents, governments and developers can take them into account, and hopefully minimize impacts upon them. Sometimes community groups undertake mapping projects in order to identify sites that are important to them, for the cultural, social or natural values they represent. See "online mapping tools" in More Information for some examples.

There are many things individuals can do to prevent unnecessary damage to habitats:

- Learn more about the natural habitats in your area, and help to educate others about their importance. Sources of local information include community stewardship groups, nature centres and online atlases and mapping tools (see More Information).
- Help reduce pollution that can damage wildlife and habitat.
- Before building on your property, learn about the natural habitat that may be impacted. There may be options to modify your project in order to better protect sensitive ecosystems on your land, and allow you to enjoy the wildlife that lives there.
- Help to ensure the value of functioning natural systems is considered in land use decisions, and consider applying some of the principles of "Smart Growth" in planning. (See Ecosystem Valuation and Smart Growth in the More Information section.)
- By using proactive shoreline and streamside development techniques, you may be able to simultaneously preserve habitat and reduce erosion and flood damage. For example, ensure buildings are set back an appropriate distance from the water body, limit the use of seawalls, and use native plants as a buffer along the shoreline.
- Preserve existing wetland and salt marsh vegetation on your property, as it provides valuable habitat for birds, fish, amphibians and mammals. These areas also help to filter and store water and protect the shoreline from erosion and wave damage.
- Plant native vegetation around your home and property. It provides habitat for native animals, limits the spread of invasive species, helps to prevent erosion, and usually requires less watering and maintenance (see natural gardening techniques)
- When undertaking construction on your property, make sure sediment and pollutants do not run off into nearby streams and harbours.
- Help to prevent the spread of invasive species in natural habitats.
- Encourage the protection of key habitats through legislation, such as ecological reserves, parks, Marine Protected Areas and conservation covenants (see More Information). Keep in mind,

however, such areas should also be linked with surrounding natural habitats, to avoid habitat fragmentation.

Special tips for fish habitat

- Consider options to conserve wetlands and estuaries on your property. These provide valuable juvenile fish rearing habitat.
- Learn about methods available for agricultural operators to reduce damage to streams and the marine environment.
- Where possible, leave large woody debris, such as fallen trees, in streams. It helps to slow down the flow of water, and creates sheltered pools for fish.
- Ensure that sediment from construction activities is contained to prevent it flowing into nearby streams and wetlands (see "regulations and guidelines for development around water" in More Information).
- Increase and improve fish habitat, while controlling erosion and sedimentation, by maintaining and planting native vegetation along shores and stream banks.
- Eelgrass beds are important habitat for many fish species; see that link, as well as tips for protecting marine vegetation.