

# The Municipal Wildlife Habitat Conservation Strategy for the Township of Langley

*Caroline Astley<sup>1</sup>*

## **Abstract**

Population growth and development in the Township of Langley is increasing at an exponential rate. While there is a recognized need for more housing and development, there exist ways to incorporate wildlife habitat and create greener, more sustainable neighbourhoods. The objective of the Municipal Wildlife Habitat Conservation Strategy is to protect and restore a healthy diversity of native wildlife species and habitats throughout the Township of Langley in perpetuity while working with the various Township departments to incorporate wildlife habitat into development. The project incorporates various methods to achieve this goal including habitat mapping and assessment, cooperation with municipal staff and governmental agencies, and formation of achievable and quantifiable habitat objectives. The habitat objectives were formed using habitat requirements derived from a set of focal species. The goal of the project is to provide municipal staff with guidelines and recommendations to be used when designing Official Community Plans and development proposals. Monitoring of success of the project will rely on the involvement of volunteers and naturalists who will submit wildlife sightings to the Wildlife Program Coordinator. These anecdotal reports will be mapped into a Geographical Information System (GIS) and then compared to historical data for spatial and trend over time analysis. Habitat mapping will be updated through ground-truthing exercises and digitizing over new orthophoto series. Any successes achieved through altered development methods or policies will hopefully be supported by biological monitoring of species and populations.

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<sup>1</sup> Wildlife Biologist, Madrone Environmental Services Ltd., 202-2602 Mt. Lehman Road, Abbotsford BC, V4X 2N3

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## Introduction

Formed in January 1993, Langley Environmental Partners Society is a community-government partnership among: Federal, provincial, regional, and municipal governments; universities and secondary schools; stewardship groups; other environmental non-profit organizations; First Nations; naturalist groups; and the community.

LEPS' goals and objectives include: to promote and conduct watershed protection and restoration activities in Langley; to provide technical support to community volunteer groups conducting environmental work; to provide education and work experience for students in areas related to environmental sciences; and to foster community cooperation in the Langley area through environment-oriented partnerships among government, teaching institutions, community associations and businesses.

Our priorities are: environmental inventory and habitat restoration in and around streams, including fish habitat assessments, stream surveying and mapping, streamside planting, erosion control, streamside fencing and salmon habitat restoration projects; and public information and environmental education, including education, training and work experience for students, public information seminars, composting and waste reduction demonstrations and watershed stewardship training for retraining fishers, aboriginal groups and community volunteers.

Located approximately 40 km east of Vancouver (see Figure 1), the Township of Langley is an area experiencing a rapid increase in size. With a population expected to double from 98 000 to close to 200 000 within the next 20 years, Langley is a region trying to include the needs of its residents with the needs of fish and wildlife.



<http://www.globalairphotos.com/gallery/BC/Langley>

Figure 1. Location of Langley.

Close to 75% of the landmass of Langley is contained within the Agricultural Land Reserve (ALR) which puts increased pressure on the remaining land area. The ALR is intended to provide agricultural land for farmers and producers and may provide significant wildlife habitat value. However, many of the most pristine forests and wetlands remaining in Langley are located in areas excluded by the ALR and are under the threat of development. Compounding this problem is the presence within the Township of over 264 species of wildlife, many of them migratory and several of them classified as species at risk. As an answer to the issue of development and wildlife habitat, LEPS in cooperation with the Township of Langley began the creation of the Municipal Wildlife Habitat Conservation Strategy.

## **The Municipal Wildlife Habitat Conservation Strategy**

Created in 1997, the Wildlife Strategy aimed to identify and rank important habitat areas within the Township. The goal of the strategy is to preserve wildlife habitat throughout the Township of Langley in perpetuity. To achieve this goal it was necessary to identify and map habitat in Langley and then rank it for importance to local wildlife. Identifying important habitat areas, judging how much habitat was available and where it was located were the first steps in formulating the basis of the Wildlife Strategy.

### **Habitat Mapping**

Mapping wildlife habitat involved a great number of person hours and the clearest orthophotos available. For the purposes of this project, orthophotos flown in 1995 were the easiest to view and interpret. Habitat types were determined using methodology developed by the Sensitive Habitat Inventory and Mapping (SHIM) program ([www.shim.bc.ca](http://www.shim.bc.ca) – see below for a summary of the identification of each habitat type), and were broken down into 13 categories:

- Broadleaf forest
- Coniferous forest
- Mixed forest
- Shrubs
- Herbs/grasses
- Exposed soil
- Wetland
- Planted tree farm
- Row crops
- Dug-out pond
- Low intensity development (impervious surfaces <10%)
- Moderate intensity development (impervious surfaces 10-40%)
- High intensity development (impervious surfaces >40%)

**SHIM Land Cover Classification System**  
**Land Cover Classes Used for Photointerpretation and Field Sampling**

<b>Class</b>	<b>Description</b>
Coniferous forest	This area has a natural tree crown cover of 20 % or more of the total polygon area, and at least 80 % of the trees are conifers
Broadleaf forest	This area has a natural tree crown cover of 20 % or more of the total polygon area, and at least 65 % of the trees are broadleaf.
Mixed forest	This area has a natural tree crown cover of 20 % or more of the total polygon area, but of the total trees no more than 80 % can be conifer and no more than 65 % can be broadleaf.
Shrubs	The area has less than 10 % tree crown cover and natural shrubs constitute 20 % or more of the ground cover. Shrubs are defined as multi-stemmed woody perennial plants, both evergreen and deciduous. <b>Qualifier: d</b>
Herbs/grasses	The area has less than 20 % tree cover, less than 20 % shrub cover, and 20 % or more natural herbaceous cover. Herbs for this classification are defined as grass-like vascular plants, including ferns and forbs, without a woody stem. Some dwarf woody plants may be included in this category. A class qualifier must be assigned to this category. <b>Qualifiers: ag, n, ur, r, d, and u</b>
Exposed soil	Areas where recent disturbance, either human or natural, has exposed the soil substrate, such as in development sites or soil slides. The main characteristic is exposed soil under active erosion processes.
Human-made surfaces (high imperviousness)	Areas covered by highly impervious man-made surfaces such as pavement, concrete, and buildings with total impervious area > 40 %. This class can include industrial, commercial, and residential areas as well as roads and greenhouses. <b>Qualifiers: ag, ur, r, and d</b>
Human-made surfaces (medium imperviousness)	Areas covered by moderately impervious man-made surfaces with total impervious area between 10-40 %. This class is similar to the human made surface (high imperviousness) class but more vegetation is present. <b>Qualifiers: ag, ur, r, and d</b>
Human-made surfaces (low imperviousness)	Areas of low impervious human made surfaces with total impervious area < 10 %. Such areas may include low density suburban houses, barns, horse tracks, paddocks, or gravel or packed soil parking lots. <b>Qualifiers: ag, n, ur, r, and d</b>
Row Crops	Areas of agricultural crops and farmland. Agricultural areas where rows cannot be identified should be classified as Herbs/grasses with an agriculture qualifier.
Planted tree farm	Areas used as tree farms, including Christmas tree farms, ornamental tree nurseries, and fruit orchards.
Dug-out pond or reservoir	Dug-out ponds, either of natural or man made origin, which have been excavated and are maintained. They are mostly cleared of vegetation and may be under sudden human induced water fluctuations.
Natural wetland	This class includes natural wetlands which are largely undisturbed by human modification and retain most of their natural characteristics.

### Class Qualifiers Used for Photointerpretation and Field Sampling

Qualifier	Code	Description
Agriculture	<b>ag</b>	This area may be used for agricultural purposes including hay fields and grazing pastures.
Natural	<b>n</b>	This area is dominated by native herb/grass species and its appearance is not modified by human use.
Urban/residential	<b>ur</b>	This area is composed of residential lawns, and may contain clumps of shrubs and trees. Vegetation is controlled and maintained by fertilizing, weeding, mowing, and pruning.
Recreation	<b>r</b>	This area is used for recreational fields, with heavily controlled and highly maintained vegetation. Examples of this area include golf courses, school fields, or parks.
Disturbed	<b>d</b>	This area has been recently disturbed and is undergoing early successional stages. Vegetation may consist of native and non-native grasses and/or small shrubs, and small patches of exposed soil may be visible.
Unknown	<b>u</b>	The use of this area cannot be identified.

Once the habitat types were determined, they were identified and digitized as individual polygons at a scale of 1:5 000 and a minimum polygon size of 0.01 ha (see Figure 2 for an example of the initial digitized polygons). This created a map of all upland wildlife habitat throughout the Township of Langley in a format that supported queries and updates. By integrating the polygons and related habitat information gathered through ground-truthing and orthophoto interpretation into a GIS, the mapping can be used to track changes in the forest canopy over time (due to development, restoration etc.) and will eventually be linked to a species/habitat database which contains all life history information for wildlife species occurring in Langley.

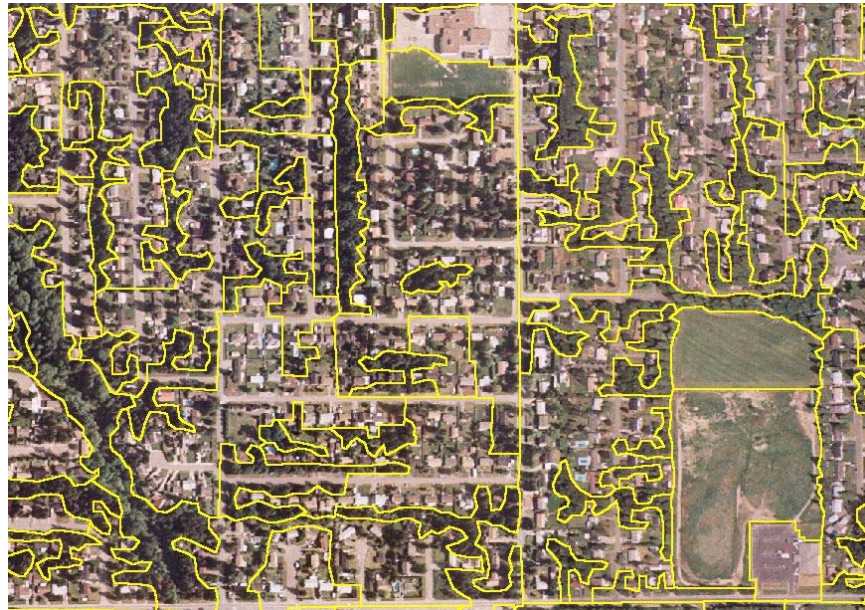


Figure 2. Example of Digitized Polygons

The mapping was updated to the 2002 orthophoto series and was ground-truthed during the summers of 2002 to 2004 by crews of 2-4 students. Continued ground-truthing is planned with the assistance of future summer staff and crews. The crews analysed forested polygons for accuracy, composition and dominant species. Information was also collected regarding disturbance level within each polygon, invasive species presence and complexity of the understory. The information gathered by ground-truthing crews provides a fine level of detail to the mapping and allows for a greater understanding of human impacts to wildlife in urbanizing areas.

### **Species/Habitat Database**

Another very valuable set of information gathered included the life history and habitat requirement data for the more than 264 species of wildlife that occur in Langley. The information was provided by the Northwest Habitat research Institute as a database. Also provided were a supplemental text book and CD-ROM which include other important data and data queries. Local species information was extrapolated from this data source as well as collected from local naturalists. The database is stored in Access format and supports queries based on all aspects of a species life history.

Eventually this database will be linked to the GIS habitat mapping to provide point and click information linking habitats and species in a user-friendly environment. It will become a useful tool for municipal staff and decision makers to help plan communities and developments to include wildlife habitat, and to identify important wildlife habitat areas for acquisition or parks planning.

### **Focal Species**

In order to determine the necessary amounts of habitat required and available in the Township, a suite of focal species was developed which were derived from the list of all possible and existing wildlife species. It was essential when determining these species to ensure they represented the entire range of habitat types found in the Township. A list of focal species was made keeping the following requirements in mind: whether the species was of national or regional importance; whether it was migratory; if it was considered at risk; the dependence on the species for that particular habitat type; if it was representative of a larger group of species; and if it was marketable. The resulting list contained 78 focal species. In hind sight, it would have been more effective to proceed with a smaller more concise list; however the needs of these species have still been useful in creating the basis of the Strategy. The focal species list can be found below:

**Open Water**

Painted Turtle  
 Hooded Merganser  
 American Coot  
 Osprey  
 Townsend's Big-eared Bat

**Wetlands**

Long-toed Salamander  
 Green-winged Teal  
 Blue-winged Teal  
 Marsh Wren  
 Rough-skinned Newt  
 Common Yellowthroat  
 Wood Duck

**Shrubs**

Bushtit  
 White-crowned Sparrow  
 Common Nighthawk

**Riparian Coniferous and Riparian Mixed Forest**

Pacific Slope Flycatcher  
 Ensatina  
 Western Screech Owl  
 Band-tailed Pigeon  
 Riparian Deciduous  
 Great Blue Heron  
 Willow Flycatcher  
 Warbling Vireo  
 Bullock's Oriole

**Mature Mixed and Deciduous Forest**

Great Horned Owl  
 Northern Saw-whet Owl  
 Western Wood-Pewee  
 Western Red-backed Salamander  
 Western Tanager  
 Cooper's Hawk

**Mature Coniferous Forest**

Pileated Woodpecker  
 Northern Flying Squirrel  
 Brown Creeper  
 Red-breasted Nuthatch  
 Douglas' Squirrel  
 Olive-sided Flycatcher  
 Winter Wren

**Young Coniferous, Deciduous, and Mixed Forest**

Townsend's Chipmunk

Douglas' Squirrel  
 Yellow Warbler  
 Willow Flycatcher  
 Pine Siskin  
 Downy Woodpecker

**Riparian Shrubs**

River Otter  
 Western Terrestrial Garter Snake  
 Virginia Rail  
 Yellow Warbler  
 Wilson's Warbler  
 Green Heron

**Grass – Improved Pasture, Unimproved Pasture, Old Field, Passive Recreation, and Active Recreation**

American Goldfinch  
 Sandhill Crane  
 Northern Harrier  
 Red-tailed Hawk  
 Barn Swallow  
 Townsend's Vole  
 Sora  
 Savannah Sparrow  
 Barn Owl  
 Short-eared Owl

**Unaffiliated or Special Measures**

Belted Kingfisher  
 Killdeer  
 American Dipper  
 Common Snipe

**High Intensity/Moderate Intensity No Trees**

Peregrine Falcon  
 Big Brown Bat/Little Brown Bat  
 Brewer's Blackbird

**Moderate Intensity with Trees/Low Intensity**

Rufous Hummingbird  
 Spotted Towhee  
 Dark-eyed Junco  
 Violet-green Swallow  
 Cedar Waxwing  
 Pacific Chorus Frog  
 Barn Swallow  
 Bewick's Wren  
 House Finch

Song Sparrow  
 Northern Flicker

**Hedgerows**

Bushtit  
 American Goldfinch  
 Western Meadowlark

**Farm Fields**

Common Snipe  
 Trumpeter/Tundra Swans  
 Northern Pintail  
 Mourning Dove

**At-Risk Species:**

Oregon Spotted Frog  
 Pacific Water Shrew  
 Red-legged Frog  
 Painted Turtle  
 Western Grebe  
 American Bittern  
 Sandhill Crane  
 Green Heron  
 Gyrfalcon  
 California Gull  
 Short-eared Owl  
 Band-tailed Pigeon  
 Snowshoe Hare (esp. subspecies)  
 Southern Red-backed Vole (esp. subspecies)  
 Long-tailed Weasel (esp. subspecies)  
 Peregrine Falcon (esp. subspecies)  
 Townsend's Mole  
 Trowbridge's Shrew  
 Townsend's Big-Eared Bat  
 Keen's Long-eared Myotis  
 Lewis' Woodpecker  
 Western Meadowlark  
 Great Blue Heron  
 Trumpeter Swan  
 Short-billed Dowitcher  
 Western Screech Owl  
 Barn Owl

## Habitat Objectives

The final step in determining recommendations for the focal species list was determining objectives for achieving the necessary habitat. This process entailed reviewing literature and life history data on each species and determining the absolute minimum requirements for each. These were then adapted to the Langley landscape and reality.

The habitat objectives were written both quantitatively (x hectares of grassland; ponds x ha in size etc.) and qualitatively (high quality grassland located in proximity to open water; mature coniferous forest with abundant coarse woody debris) to allow for the most flexibility. Contact the author for more information regarding the habitat objectives.

## Habitat Status Reports

Another factor in the development of the project is the production of various habitat status reports for each of the developing communities in Langley: Willoughby, Brookwood; Aldergrove; Fort Langley; Murrayville; and the Salmon River Uplands. These reports combine specific habitat data and wildlife sightings (both historical and anecdotal) and provide specific recommendations for areas identified as important.

The first of these reports was created for Willoughby (located in the northwest of Langley, around the Highway 1/200<sup>th</sup> Street interchange – see Figure 3 for the locations of Langley’s communities) in September of 2003 and revised in March of 2004. The report aimed to identify in Willoughby those forested patches which were of most importance and provide recommendations regarding how development might include, or exclude, these areas. Other habitat types were not covered in this report as they were of lower importance in this area. Although the development of Willoughby was finalized many years previously, and development had already begun, it was hoped that the report would shed some light on how the community may have been developed slightly differently had this information been available.

The report contains maps of each neighbourhood slated for development including identification of important habitats ranked as either red “stop” for those patches of forest which were important for local wildlife and yellow “yield” for those areas which could be used for human residence or recreation with careful planning, see figure 4 for an example from the Northwest Gordon Estate neighbourhood in Willoughby (see Figure 4). It also provides some general recommendations for the entire area as well as specific recommendations for each neighbourhood. Copies of the report are available by contacting the author of this paper, and will be available shortly on the LEPS website at [www.leps.bc.ca](http://www.leps.bc.ca).

With sufficient funding, reports for the other developing communities are planned. Each area has its own specific issues and will be addressed on an individual basis. Condensed and highly graphical versions of each report will also be made available for the general public, Township councillors and staff.

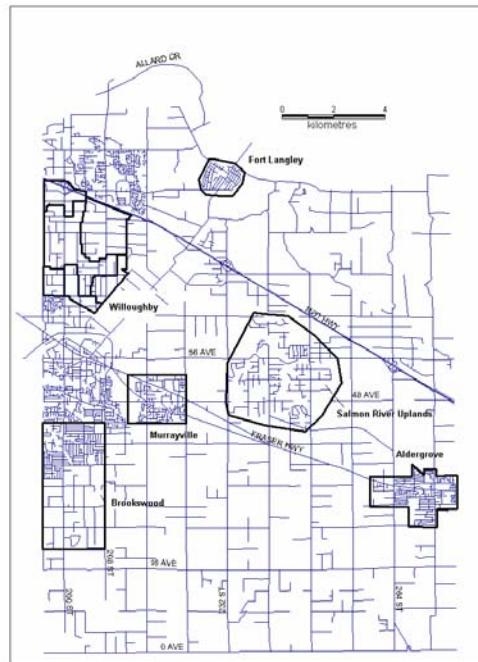


Figure 3. Location of Langley's communities

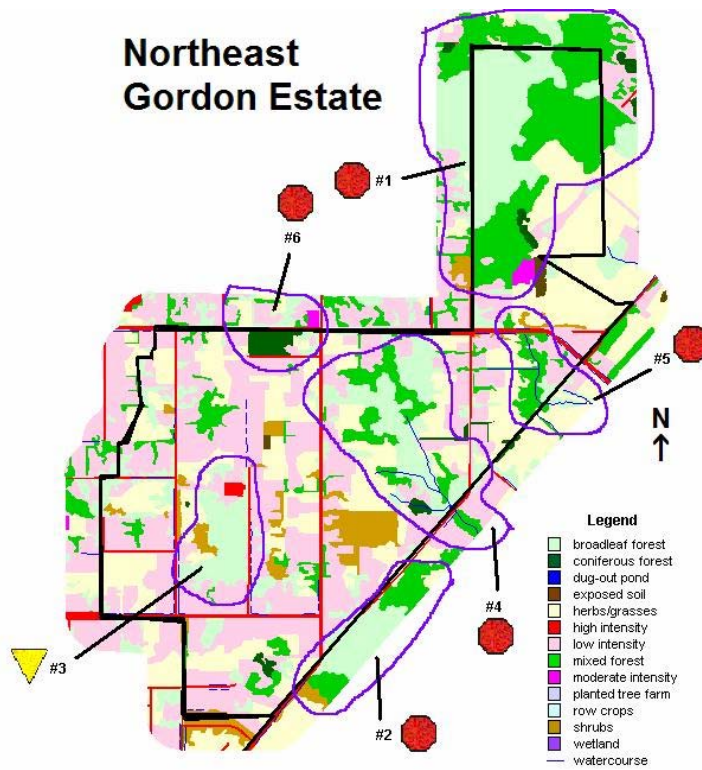


Figure 4. Northeast Gordon Estate

## Monitoring

Measuring the success of this project will be accomplished using the observations of both skilled and non-skilled habitat and wildlife monitors. Skilled monitors will be recruited from post-secondary schools including Trinity Western University (TWU) and British Columbia Institute of Technology (BCIT). These monitors will generally be students working towards a degree or diploma in wildlife or environmental sciences and will include monitoring Langley's wildlife and habitats as part of their curriculum.

Other monitors include residents of Langley. These non-skilled monitors are provided with wildlife observation sheets and as the project evolves, and more funding becomes available, will also be provided with a short training session, resources, and a habitat assessment report form to aid in their monitoring. The residents will monitor their own feeders, backyards, acreages, and neighbourhoods for signs of wildlife use and for anecdotal observations. Paired with the more scientific monitoring information gathered, this non-scientific method will provide another layer of information to help gauge the health of Langley's wildlife populations. A copy of the "Wildlife Sightings Form" is included at the end of this report.

Currently, most wildlife identification comes from LEPS staff and affiliates who note "interesting" wildlife sightings during site visits and other outdoor activities. Habitat assessments are performed during ground-truthing activities which are performed by seasonal LEPS staff.

## Next Steps

The next steps for this project include updating of the mapping and collection of habitat information, monitoring of wildlife habitat and use of habitats around developing communities, and implementation of the recommendations put forward by this project.

Implementation of the Strategy by the various municipal departments is crucial for the success of this project. Due to the large increase in population expected in Langley, it is important to make sure that wildlife habitat is identified and included into development plans. The most logical way to do this is to involve the Parks department and acquire land as natural parks, trails or wildlife areas. Other methods involve using Planning tools, such as bonus densities, and Engineering tools, including culverts to create wildlife underpasses under major roads, to include wildlife values into development plans.

Other important tools include the involvement of the community and stewardship groups. We are fortunate in Langley to have the assistance of several stewardship groups affiliated with several of the major watersheds. These include Yorkson Creek, Glen Valley, Salmon River, Bertrand Creek, and Little Campbell River. These groups are active within their communities and watersheds and provide important information on the health of their watersheds.

The community is also vital to the success of any on-the-ground project. The Wildlife Strategy will rely on volunteer monitors to keep an eye on their own backyards and neighbourhoods and note any changes that may occur in wildlife richness and diversity, or in habitat quality and quantity. An annual bird count for Langley is in the works to help aid this process and to collect science-based records in addition to anecdotal evidence.

## **Conclusions**

The Municipal Wildlife Habitat Conservation Strategy has served as a valuable tool for bringing the needs of wildlife and habitat into the realm of development. By using the unique relationship that LEPS has with the Township of Langley, the Wildlife Strategy has produced recommendations and methods for wildlife habitat conservation which play on existing policies and suggest new methods.

The next phase of the project, Integrating Wildlife Habitat Conservation into Growing Communities, will take the recommendations and continue their evolution. LEPS will also provide support to the activities of Township staff as the recommendations are integrated into policy and procedure. Activities ranging from university and college studies to bird counts as well as education programs including National Wildlife Week activities and materials for school groups will continue to promote local wildlife needs and issues.

The success of the project will be measured through monitoring wildlife and their habitats. Members of the general public and stewardship groups will play a large role in the monitoring of wildlife and habitats. As the program develops further, critical habitats will be identified, and monitoring efforts can be focused. It is the hope that with the cooperation of the Township of Langley, community groups and LEPS that wildlife and wildlife habitat will continue to be preserved and monitored, and that the information gathered through the process be used to further understand the needs of Langley's diverse wildlife.