

Larch Park : Sustainable Urban Development by Rebuilding a Native Ecosystem

Larch Park is an Edmonton residential development applying ecological theory and ecosystem restoration practices to rebuild native ecosystems rather than horticultural turf communities. It is being built on an old-field in Edmonton's 'table-lands', the flat areas above river and stream ravine valleys. To ensure ecological accuracy, native plant installation is based on models developed from the analysis of natural areas with minimum disturbance from urbanization or farming. The first phase of native ecosystem building is the creation of an 8800 m² Storm Water Management Facility (SWMF).

The ecosystem of the SWMF is based on the Rough-Fescue Prairie, Aspen Parkland ecoregion that Edmonton resides within, and the Ravine valleys within Edmonton. Larch Park is unique because it is beside the White Mud Creek Ravine valley, which is host to a biologically diverse Spruce – Aspen Mixed Forest remnant. Because the majority of the table-lands neighbouring ravine valleys in the Edmonton area have been extirpated, there is no current model for the species composition of the area. However, there would likely have been plant species from both mixed forests and prairie communities.



Figure 1. Larch Park SWMF plant communities. Light blue perimeters signify Rough Fescue Grassland, red perimeters Spruce, and dark blue Aspen. Image created by IBI Group

The SWMF has been divided into four ecosystem types according to where they are most likely to be found based on environmental characteristics, and to ensure that the species needed for a robust community are present. Rough-Fescue Grasslands have been installed at the North side of the pond (Figure 1). This is the section that will receive the greatest amount of sunlight, leading to evaporation, which may reduce the success of forest species. In the central area of the pond near the water, Black Spruce will be installed on both East and West shores. White Spruce will be installed higher up the slope near the property line. Aspen and other deciduous species are also being installed, creating a mixed-wood forest. Along the South slopes Aspen communities are being installed, because they require more moisture than grassland plants, but aspen may also invasively spread.

The arrangement of these communities was developed so as to provide maximum potential for communities to establish. For example, Edmonton experiences long periods of droughts that inhibit tree growth. The mixed-wood forest community acts as a buffer between the aspen and the grassland communities so that aspen does not overgrow the grasslands in the case of a couple of wet years. Subsequent dry years could lead to a loss of aspen trees, and because the grasslands were prevented from having strong establishment, an opening of conditions allowing invasive species colonization and restoration failure.

Project Partners: Moving from conventional ideas to using native ecosystems

Larch Park is a joint venture between Melcor Developments Ltd (www.melcor.ca) and Arctos & Bird (www.ArctosBanff.ca). IBI Group is responsible for the project management. Melcor hired a recent University of Alberta graduate who studied under Dr. James Cahill of the Department of Biological Sciences, Michael Rawson Clark, to help 'green' the development by applying ecological principles. They did this after seeing Michael's presentation on building native ecosystems in urban areas, based on work for his Master's degree. Michael has since started Clark Ecoscience and Sustainability, a business that designs indigenous ecosystems for interested Albertans.

After initial deliberations, IBI Group, Melcor and Michael decided that the best way to apply ecology to make a more sustainable urban area would be to recreate a native ecosystem within the storm water management pond.

The openness, imagination, and a drive to promote new ideas in development drove the team to think holistically about the ecosystem. Soils were installed to a maximum depth of 150 when possible, and to increase microtopography berms were created around the site. Over 75 species of trees, grasses and forbs were planted using seeding and plugs. Plugs were installed in 'islands' that will expand over time. Bedrock Seed Bank supplied the majority of the plants. The major challenges of this project were to ensure that ecological considerations met the requirements of engineering and Edmonton regulations, as well as maintenance considerations.

A major component of this project is a long-term monitoring project. Students from the University of Alberta will investigate the success of establishing the desired native ecosystems. Will the SWMF ecosystems have ecosystem services similar to those of native ecosystems used as models? Students will come to understand the importance of including ecological principles in urban development, connect the greater community, and ensure Edmontonians understand the impacts of urbanization and land use on ecosystems. Knowledge generated from study of Larch Park will be communicated to Edmontonians and other interested groups, governments and companies.

Larch Sanctuary

The neighbouring White Mud Creek ravine valley has been turned into a conservation area. This area is one of the models for Larch Park, and will be an important connection for residents of Larch Park and the surrounding communities. Study of this Sanctuary by University of Alberta students is an important component of the long-term monitoring project for Larch Park. Students will be able to see how constructed sites differ from natural areas with differing amounts of human use.