



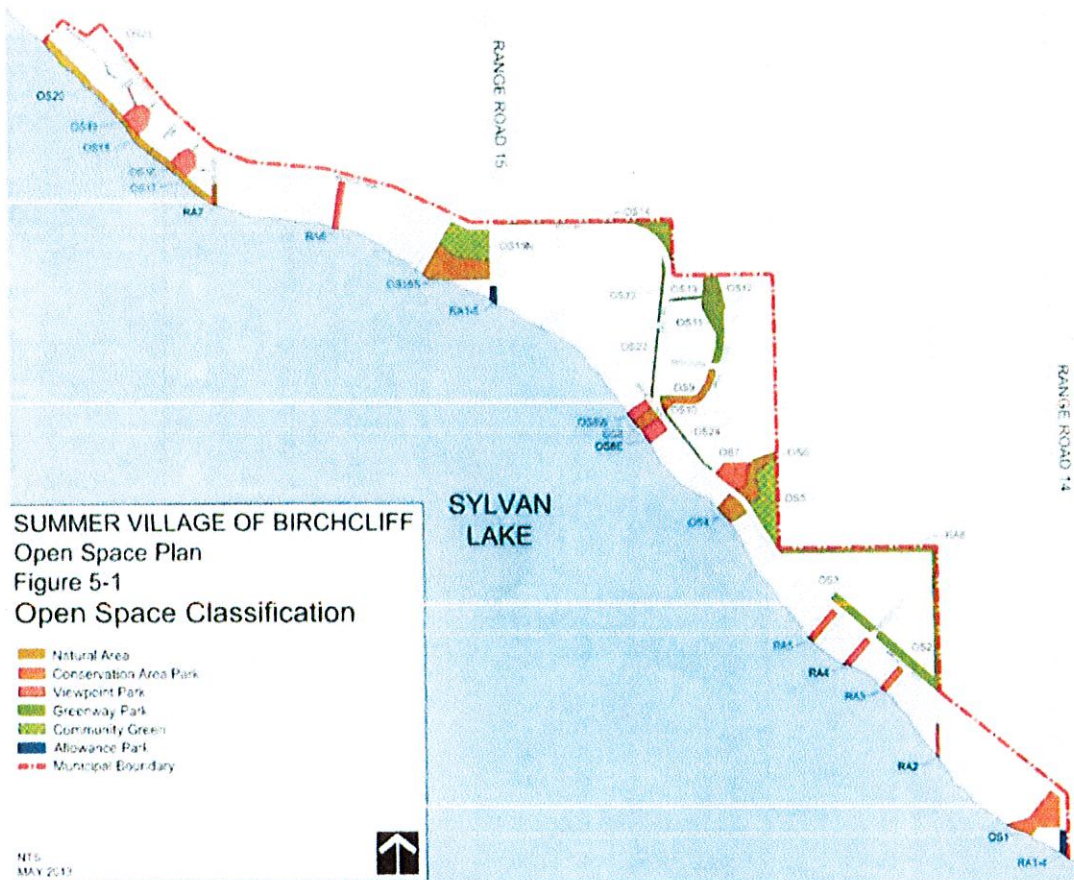
## Consultation Report

File #: FAN-2014-58

Location: Birchcliff Open Spaces, Sylvan Lake

A detailed assessment of the open spaces within the Summer Village of Birchcliff, Sylvan Lake, Alberta was performed on September 30<sup>th</sup>, 2014. The assessment involved creating an inventory of native and invasive plant species, assessing current and future erosion potentials, shoreline modification, and effects of adjacent properties and property owners. The following report presents the results of the assessment and makes recommendations for future planning and land use decisions for the open spaces.

This report is organized into two sections; shoreline open spaces and upland open spaces. The individual open spaces within these two sections are listed from southeast to northwest. Open space labels correspond to the map below.



### **Shoreline Open Spaces**

This portion of the report outlines the open spaces with lake access and covers areas OS1, RA3, RA4, RA5, OS4, OS8E, OS8, OS8W, OS15S, OS17, OS18 and OS20. The native plant communities within these sites were all very similar and contained many bank stabilizing species that have been highlighted below. The following is a list of trees and shrubs that were found in all of the shoreline open spaces:

#### **Trees**

- Trembling Aspen – *Populus tremuloides*
- Balsam Poplar – *Populus balsamifera*
- Paper Birch – *Betula papyrifera*
- White Spruce – *Picea glauca*

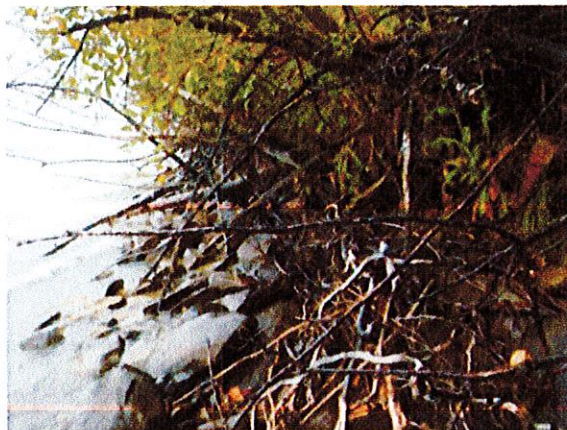
#### **Shrubs**

- Choke cherry - *Prunus Virginiana*
- Douglas Hawthorn – *Crataegus douglasii*
- Saskatoon – *Amelanchier alnifolia*\*
- Willow – *Salix sp.*\*
- Red Osier Dogwood – *Cornus stolonifera*\*
- Wild Rose – *Rosa acicularis*
- Canadian Buffalo-berry - *Shepherdia Canadensis*\*
- Snowberry - *Symphocarpus albus*\*
- Wild Black Currant - *Ribes americanum*

\* Plants with an asterisk beside them have bank stabilizing roots.

Although this is not an exhaustive list, it will provide insight into what plants to use for further projects. The native vegetation in this area provides *crucial* protection to the shoreline sites below through the following processes:

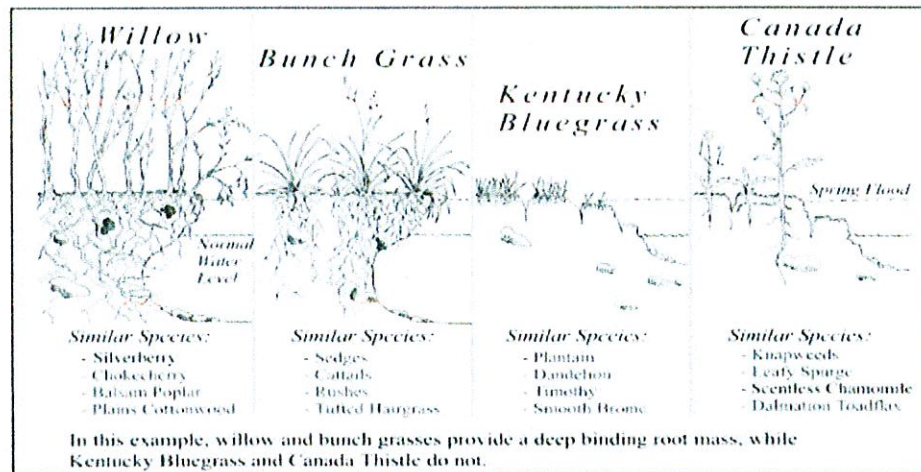
- *Woody debris deposition:*  
As time passes, wave erosion exposes roots of the shoreline vegetation. The shoreline vegetation also drops woody debris onto the shoreline area. Both of these processes combine to create increased levels of woody debris on the shoreline. This woody debris acts as shoreline protection by reducing the forces of



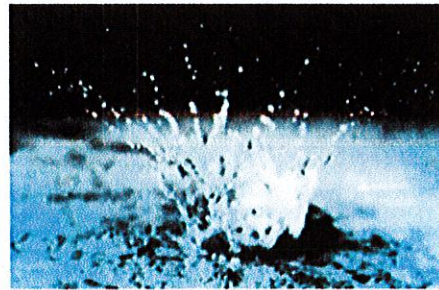


wave erosion. As Sylvan Lake is prone to high boat traffic and heavy winds, the service provided by this woody debris is very beneficial.

- **Bank stabilization:** Many of the native trees and shrubs listed above have roots that penetrate and migrate deep into the bank. These roots help to stabilize the soil on the shoreline and bank from wave and run off erosion. The diagram below shows how native species provide the best shoreline stability whereas introduced and invasive species can often be the reason that shoreline erosion is severe.



- **Soil protection:** Native ecosystems often contain many different plants. These different plants often coexist and grow at a variety of heights to create different canopy levels. The trees create a high canopy, shrubs a mid-canopy and herbaceous plants a low canopy. These canopies act as umbrellas by protecting the soil from the erosive potential of precipitation. When precipitation hits bare ground it will move small amounts of soil down slope. In large precipitation events, the cumulative effects of this action can create severe erosion.



- **Nutrient capture:** Plants on the shoreline provide a physical barrier to nutrients and soil destined for the lake. Diverse native vegetation acts as a filter and captures these nutrients which are then used to increase plant growth. This, in turn, immobilizes the nutrients.
- **Wildlife habitat:** Native shoreline vegetation also creates unique habitat and food that is necessary to sustain native wildlife populations. One

example of habitat found in these sites is the mature Trembling Aspen and Balsam Poplar trees. These trees are necessary for the nesting cavities of the Pileated Woodpecker. The Pileated Woodpecker creates large cavities in the trees where it lays egg and raises young. After the Pileated Woodpecker is finished with the nest, there are over 50 other species of bird and mammal that are dependent on Pileated cavities for habitat. These species include mergansers, wood ducks, flying squirrels, owls, bluebirds, and martens. The native plant community in these sites also has a diverse selection of wildlife feed which supports a large number of animals.



Birchcliff is known for its steep and high banks down to the lake. The slope and length of slope of the shoreline varies throughout the summer village. Moderate and severely slopped shorelines are more susceptible to erosion because they have less ability to hold soil particles. Medium and long slopes are also more susceptible to erosion because run-off water gains more speed on longer slopes.

The two main concerns with erosion are loss of property and nutrient flow into the lake. Erosion can undermine banks and cause them to collapse. When property and infrastructure are at risk, erosion becomes an important matter to deal with. Erosion is also responsible for a large amount of nutrient addition into the lake. Elements such as phosphorus and nitrogen are bonded to soil. When soil is eroded off of the shoreline and into the lake these elements can be released into the lake. These elements are of concern because they increase the risk of blue-green algae blooms in the lake.

Shoreline erosion also disturbs the soil near the shoreline which creates a perfect spot for the establishment of invasive species. Invasive species often cause further erosion because they can outcompete native plants that have shoreline stabilizing roots. Many invasive species have very small root systems that can not sufficiently stabilize the shoreline.

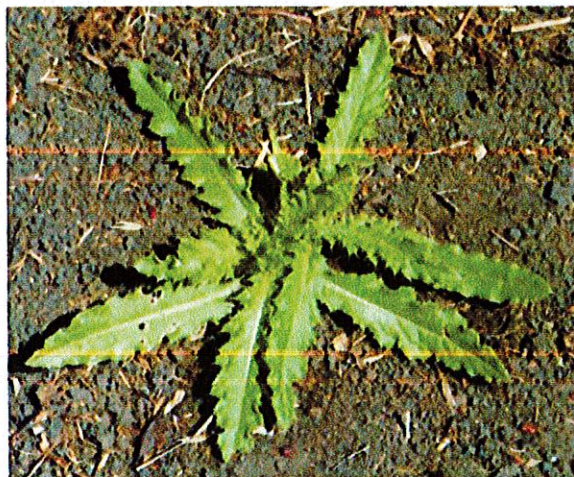
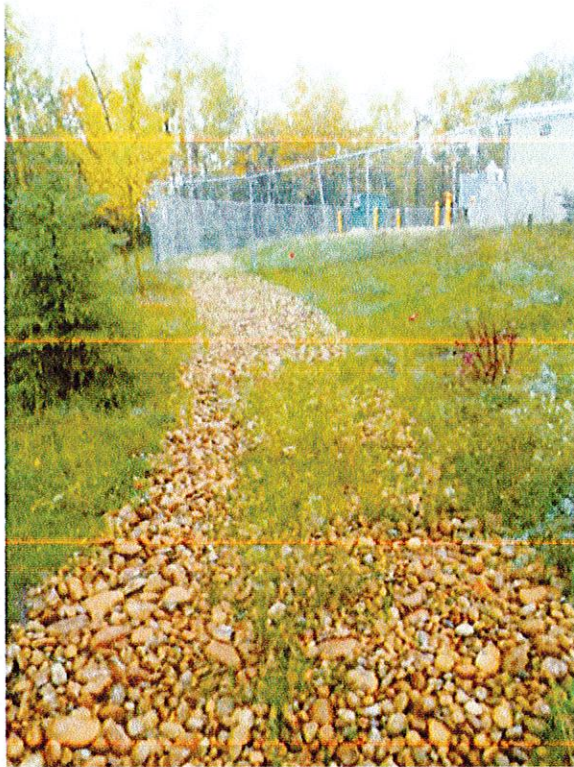




**OS1:**

Site description: This site is on the South East end of the summer village and contains a utility station on its upland portion. Although the area surrounding the utility station has been cleared and disturbed, great steps have been taken to minimize the run-off and erosion potential. The gravel filled swale (right) drains the entire utility site to the road and helps slow the speed of the run-off. Sediment fence has also been installed on the downward side of the site to prevent sediment from flowing off site.

The disturbance caused by developing this site allowed for Canada Thistle to establish. Canada Thistle is a noxious weed that must be controlled according to the Alberta Weed Control Act. This species has reproductive root structure that make it difficult to eradicate. Canada thistle grows and spreads rapidly in full sun. The best long term control in this location will be to hand pick the thistle so that native trees and shrubs can establish. The native plants will grow and shade the Canada Thistle. This will reduce the spread and growth of the Thistle.



The shoreline portion of this site has a medium length severe slope that is highly susceptible to erosion. The mature forest on the slope helps to prevent erosion on this site. Currently the shoreline has only minor erosion but is significantly protected by the dense vegetation and woody debris. The only downfall of the shoreline on this site is that Perennial Sow Thistle has established. This Noxious weed may cause further erosion and should be hand-picked.



Site Suggestions:

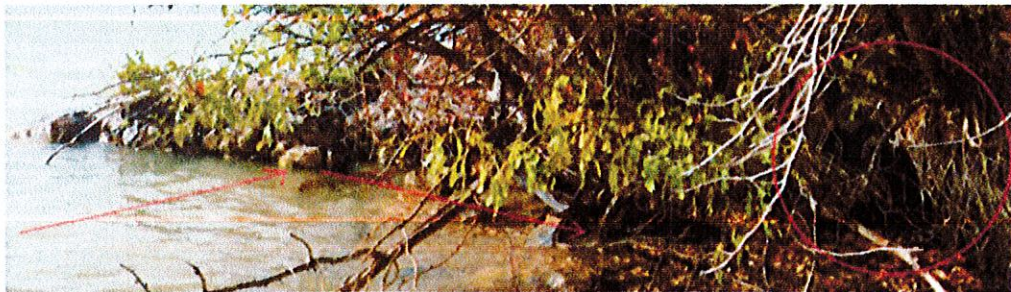
- ☐ 1 The shoreline on this site has severe erosion *potential*. Ensure that the native vegetation is not cleared or pruned and avoid any shoreline development
- ☐ 2 Have maintenance workers or site developer's focus on controlling the Canada Thistle and Perennial Sow Thistle that has established before it becomes a significant problem.
- ☐ 3 Allow the area surrounding the utility site to naturalize.



**RA3:**

The upland of this site is covered in dense native vegetation. Closer to the shoreline this changes to an increasing amount of Caragana which outcompetes the native plants. This may be problematic because of the amount of erosion that is occurring on the shoreline area of this site. This site is between two residential lots. The lot to the west has installed gabion baskets to reduce the direct erosion to the property. The problem with the gabion baskets is that they are directing wave energy to RA3 and causing severe bank erosion problems.

The pictures below show how this process may occur and also shows the amount of undercut that has occurred on this bank.



It is difficult to control this level of erosion, however, I recommend that steps be taken to prune the Caragana plants so that native vegetation can recolonize the



area. I also suggest using this area to show residents the effects that hardened shoreline structures can have on native areas near their properties.

Site Suggestions:

- ☐ 1 The shoreline on this site has severe erosion *potential*. Ensure that the native vegetation is not cleared from the upland area.
- ☐ 2 Have maintenance workers or site developer's focus on slowly pruning out the Caragana on this site to allow native vegetation to establish and stabilize the bank.
- ☐ 3 Use this site to show the negative effects that shoreline hardening structures can have on native sites.

**RA4:**

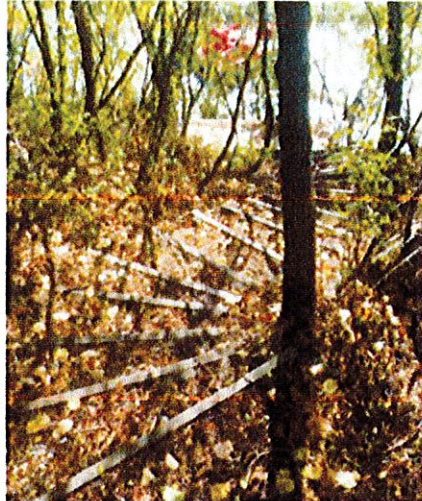
This site begins at the end of a long paved section of road. It also has a culvert that leads to a drainage ditch on the site. Both of these factors dramatically increase the amount of runoff water coming through the site. Increased water flow leads to an increased risk of erosion of this site. The upside to this site is that it is densely vegetated with native plants which help to reduce the erosion potential. The majority of the site slopes gently towards the shoreline until the final portion which becomes quite steep.

The final steep section of this site is predominantly covered in dense Caragana. This may be a problem in the future and I suggest slowly pruning this out so that native plants can reestablish.





This site is used as shoreline access for back lot residents. The path descending onto the shoreline of this site has had steps installed. This path is curved which helps reduce the chances of erosion. These steps should not be of concern. There is also a significant dock on the shoreline. Make sure that docks on this site are removable and not repainted or cleaned on the water.



#### Site Suggestions:

- ☐ 1 The shoreline on this site has severe erosion *potential*. Ensure that the native vegetation is not cleared from the upland area.
- ☐ 2 Have maintenance workers or site developer's focus on slowly pruning out the Caragana on this site to allow native vegetation to establish and stabilize the bank.
- ☐ 3 Ensure that shoreline structures such as rip rap or gabion baskets are not used on this site.

#### RA5:

This site has similar characteristics to RA3 and RA4 in the upland. This site has a highly erodible steep bank that leads down to the water. The water's edge on this site could not be accessed due to the pitch and vegetation cover. The shoreline portion of this site is a mixture of Caragana and native plants. All of the vegetation on the shoreline of this site has been pruned to allow for a view. Although pruning the Caragana is suggested, it is highly recommended that pruning the native vegetation is restricted on this site. When all of the native tree canopy is removed, there is an



increased risk of erosion. With the severe erosion potential on this site, maintaining a healthy canopy to protect the soil is very important.



This site is good for demonstrating why it is beneficial to slowly prune the Caragana. When the Caragana is pruned it uses less sun, nutrients and moisture. When these resources are more available, native plants have access to these resources and can start to reestablish themselves. The picture to the left shows Wild Rose, Trembling Aspen and Balsam Poplar regrowth in the area where Caragana was pruned. These plants are native and are known for their shoreline stabilizing properties. Once these native plants grow enough to create a significant canopy above the Caragana, the Caragana should be completely removed by workers.

#### Site Suggestions:

- ☐ 1 Ensure that native plants stop being pruned on this site.
- ☐ 2 Have the adjacent homeowners focus on slowly pruning out the Caragana on this site to allow native vegetation to establish and stabilize the bank.
- ☐ 3 When native vegetation becomes dense again, entirely remove the remaining Caragana on the site.



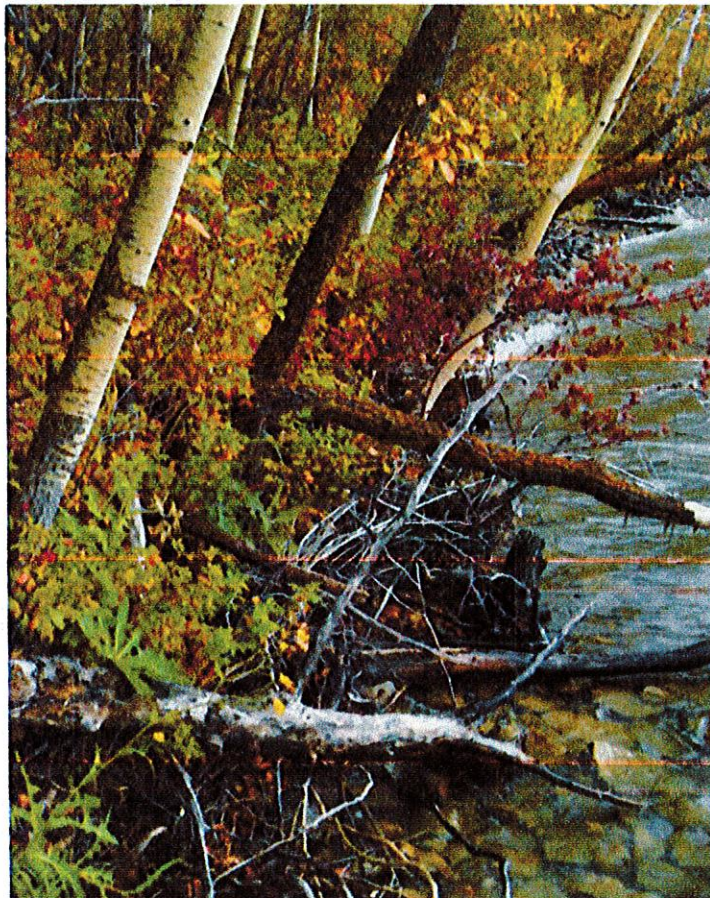
**OS4:**

This site has a culvert that leads to a drainage ditch on the site. This factor increases the amount of runoff water coming through the site. Increased water



flow leads to an increased risk of erosion on this site. One beneficial attribute of this site is that it is densely vegetated with native plants which help to reduce this erosion potential. This site slopes gently towards the shoreline which also reduces the erosion potential. This site has low numbers of Perennial Sow Thistle and Caragana that should be controlled when they are still manageable. Otherwise the site is in great

condition. The shoreline has little signs of erosion, most likely due to the woody debris and thick native vegetation shown below.





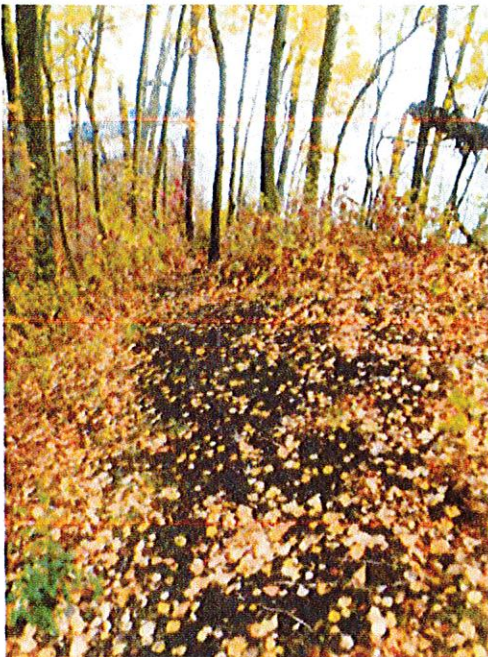
**OS8E, OS8 and OS8W:**

The upland portion of this contains a culvert that leads to a significant drainage ditch. This ditch has signs of significant erosion (right). This erosion may be caused by clearing in the uplands. As shown on the map, the open spaces OS11, OS12, and OS13 drain into this area. These three sites have been cleared of all native vegetation. When native vegetation is cleared, most of the water that would have been used by the plants becomes run-off. This increased water runoff in the uplands may be leading to increased erosion in this area. With increased erosion in this area, invasive species will be able to colonize more easily.

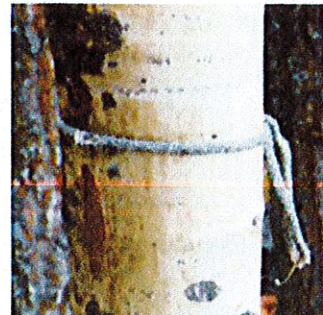
Currently the only invasive species of concern on the shoreline is Perennial Sow Thistle. It should be controlled by hand picking.



The access path leading down to the water is quite steep and has little vegetation on it (left). The bare soil in this area has a greater chance of being eroded. It may be a good idea to install some simple stairs before the erosion on this slope becomes a concern. Steps like the ones shown in RA4 would be a cheap and easy way to reduce the erosion on this site.

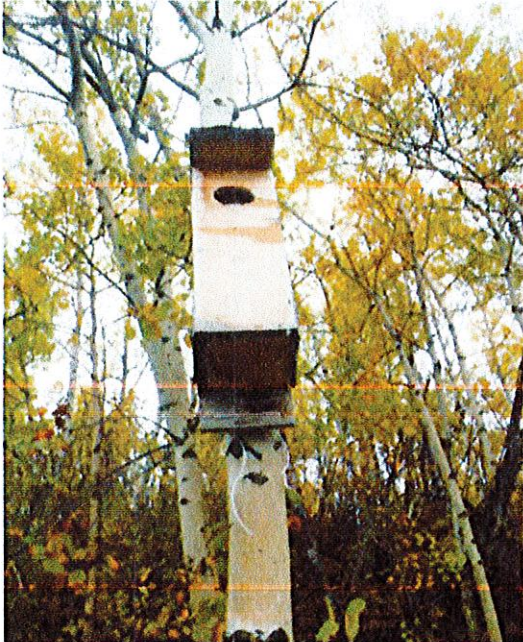


It is also recommended that any rope on trees in the open spaces be removed. Although it seems insignificant, even a small amount of rope will lead to the death of large trees.





This site has great native and manmade wildlife habitat as shown in the pictures below. The nesting box (below left) has been used by waterfowl and will continue to provide habitat similar to that made by the Pileated Woodpecker. The burrow (below right) would be home to larger ground dwelling mammals.



Site Suggestions:

- ☐ 1 Try to reduce the amount of water that enters this site through the culvert by vegetating the upland area in open spaces OS11, OS12 and OS13.
- ☐ 2 Make efforts to reduce the number of Perennial Sow Thistle on the site.
- ☐ 3 Consider installing simple steps on the access path before erosion becomes a serious problem on the slope.
- ☐ 4 Remove any ropes on the shoreline trees and make sure users are aware of the problems associated with this practice.



**OS15S:**

The majority of this site is covered in dense vegetation. Lilac bushes and Canada Thistles should be of concern in this area. Lilacs should be treated with a similar process as Caragana. Slowly prune the Lilacs until native vegetation reestablishes and then remove the rest of the Lilac shrubs. Canada Thistle should be hand pulled in this area

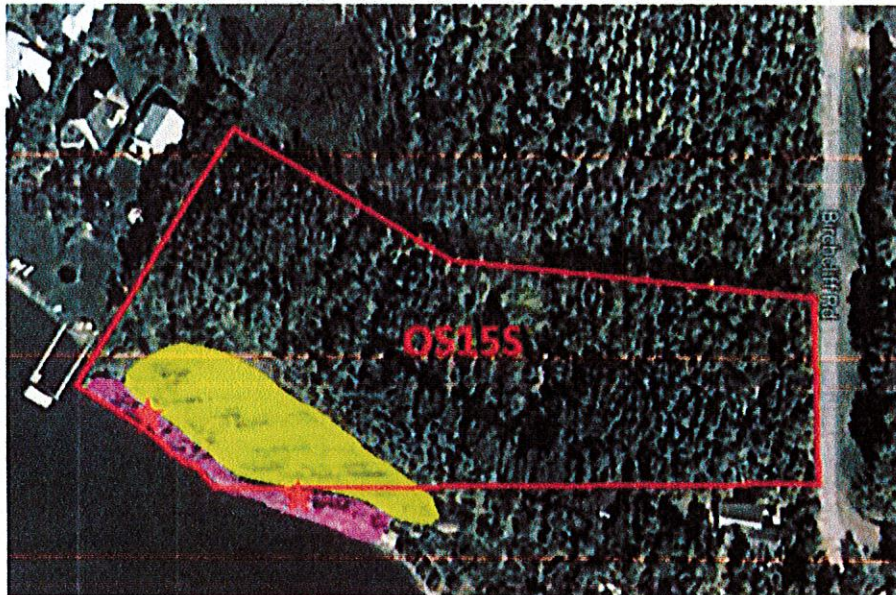
This site contains a **major concern**. The map below helps to illustrate the concern. A legend is provided below.

Red line = Boundary of OS15S

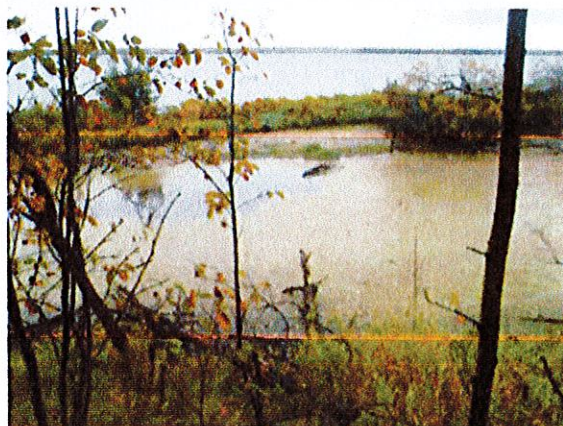
Green area = Wetland

Purple area = Shoreline area of concern

Red star = Sites of Himalayan Balsam (Prohibited noxious weed)



The wetland portion of this site seems to be below the water level of the lake. The purple area shown above is a small shoreline berm that separates the lake from the wetland. The berm is composed of highly erodible sand that is covered in dense vegetation.





One of the plants on this berm is a prohibited noxious weed called Himalayan Balsam. Prohibited noxious weeds must be eradicated from this site under the Alberta Weed Control Act. The plant was observed in two areas shown by the red stars on the map. One of which was on the property east of the open space. Himalayan Balsam (below) is an annual weed, which means that it grows from seed each spring and dies in the fall. When the plant dies, the roots (below) die and do not provide any structure to the soil under the plant. This makes the area extremely prone to erosion. This small berm is the only feature separating the lake and the wetland. The more Himalayan Balsam that colonizes the berm, the higher the potential for the berm to be eroded and the wetland turned in to a portion of the lake. Wetlands should be conserved because they are important filters for the lake. Himalayan Balsam can spread rapidly by seed because it is able to expel seeds over long distances. The seeds establish easily in wetland and shoreline areas. I highly recommend that this area be surveyed in detail for the plant and adjacent homeowners be educated about the plant. Fact sheets for Himalayan Balsam are available on the following site. <https://www.abinvasives.ca/fact-sheets>



Site Suggestions:

- ☐ 1 Ensure that Himalayan Balsam is eradicated from this site and adjacent homeowners know about the weed. There should also be an annual check for this weed.
- ☐ 2 Make efforts to reduce the number of Canada Thistle plants on the site.

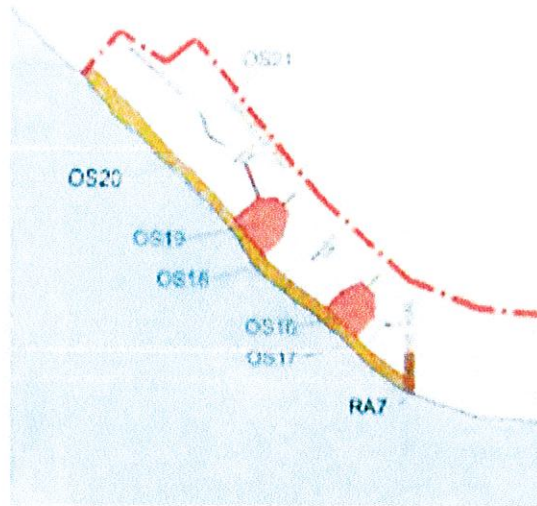


**OS17, OS18 and OS20:**

Site description: These sites are on the North West end of the summer village. Limited access has led to their amalgamation in this report. Primary shoreline access to this site is a staircase from OS19. This staircase goes down a long, steep, and highly erodible bank.

Most of the bank visible from the staircase is covered with clumped-dense vegetation which provides adequate cover for the shoreline. It was evident that residents who bordered OS20 had manipulated the natural area by building hardened structures on the shoreline. These hardened

structures often protect shorelines that have been cleared of their native vegetation. The problem with hardened structures is that rather than absorbing and reducing wave energy, they deflect wave erosion onto the native shoreline. Over time, hardened structures lead to high levels of erosion on the adjacent native shoreline sites. I suggest that an inventory of shoreline development is created so that future alterations must be regulated and done correctly.



The photo below shows some of the effects that gabion baskets combined with lack on vegetation have on the shoreline at the base of the access stairs.





The area accessed by the staircase has been leveled and acts as a storage location for two docks (below left). The problem with this is the potential for damage and movement by ice. Along with these two functioning docks were many other docks (below right) that had been damaged by ice and pushed up into the trees.



Perennial Sow Thistle and Creeping Bellflower are noxious weeds that must be controlled according to the Alberta Weed Control Act. The level of disturbance around the lakeshore makes a perfect place for invasive species to colonize so it is important to get rid of as much seed as possible. When seed drifts into the water it can be moved to new areas around the lake very easily.

Site Suggestions:

- ☐ 1 This shoreline on this site has severe erosion *potential*. Ensure that the native vegetation is not cleared or pruned and avoid any shoreline development.
- ☐ 2 Make an inventory of current shoreline development in Birchcliff. This will make sure that any future shoreline development is regulated and done correctly.
- ☐ 3 In the spring check that the docks in this area have not become victims of the lake ice. The abandoned docks in this area are becoming unsightly and unnecessary.



## **Upland Open Spaces**

This portion of the report outlines the open spaces with no lake access. The majority of these areas were mature aspen parkland with little to note in terms of environmental concern. The open spaces have been clumped into two major sections. The first being sites that are beneficial to the area and should be left undeveloped. The second section outlines sites that would benefit the community and lake health if they were naturalized.

### **OS2, OS3, OS5, OS6, OS7, OS10, OS14, OS15N, OS16, OS19, OS22, OS23, OS24:**

These upland sites were mostly mature forest, with the exception of OS14 which was a younger stand. The trees and shrubs in this area consisted of the following species.

#### **Trees**

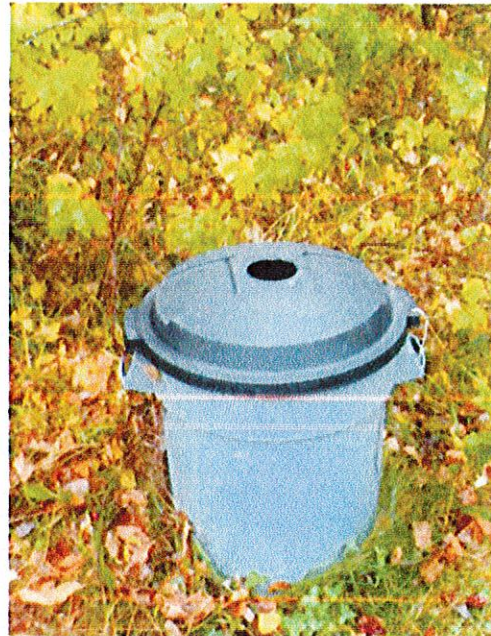
- Trembling Aspen – *Populus tremuloides*
- Balsam Poplar – *Populus balsamifera*
- White Spruce – *Picea glauca*

#### **Shrubs**

- Choke cherry - *Prunus Virginiana*
- Saskatoon – *Amelanchier alnifolia*
- Willow – *Salix sp.*
- Red Osier Dogwood – *Cornus stolonifera*
- Wild Rose – *Rosa acicularis*
- Canadian Buffalo-berry - *Shepherdia canadensis*
- Snowberry - *Symphocarpus albus*
- Wild Black Currant - *Ribes americanum*

Although this is not an exhaustive list, it will provide insight into what plants to use for naturalizing the cleared upland sites. The trees in the upland provided numerous services for the wildlife and property owners in this area. Among these services are dust reduction, air and water purification, privacy and high value wildlife habitat.

Most sites were home to small patches or individual plants of Caragana. Homeowners should be made aware that Caragana is an unwanted species near lake shores and asked to eradicate the species from their areas. Site OS15N had large amounts of Caragana and Lilac which were most likely introduced as a hedge species on what looks like an old homesite. These species should be cut down to the ground so that native species can recolonize. Seeds of these species can be transported on shoes, clothing and pets to the lakeshore where a new infestation can begin.



One of the upland sites (OS15N) had signage indicating that no motorized vehicles were permitted and a fence that restricted access. Having this sort of signage at major entrances to open spaces is a great idea. ATVs often create increased erosion and bare soil in native areas. This will predispose the area to increased weed colonization. ATVs also create noise pollution which disturbs wildlife and community members. The same site also had a waste bin that looks to be managed by a nearby homeowner. Installing a few strategically placed waste bins may be a good proactive step to reduce the amount of pet waste and litter in the open spaces.

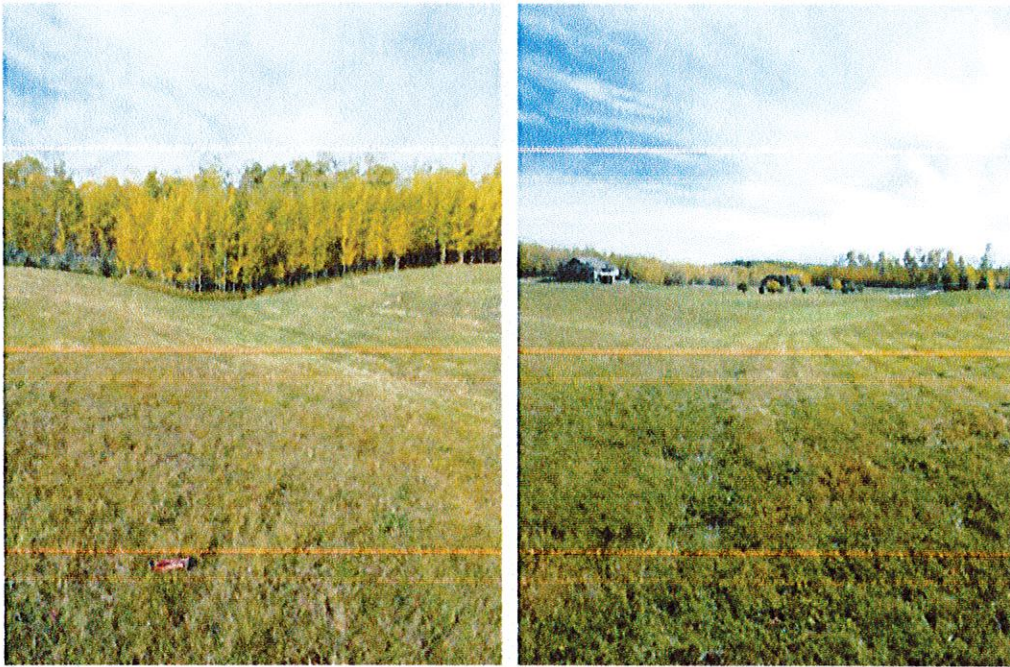
#### Site Suggestions:

- ☐ 1 Allow these wooded sites to be undisturbed. They are worth a great deal to the community and the lake.
- ☐ 2 Spread the word that Caragana and Lilac shrubs are unwanted species that can have negative effects on the shoreline area.
- ☐ 3 If trails are created in these areas, make sure that they are small and do not lead to the introduction of invasive species.



**OS9, OS11, OS12 and OS13:**

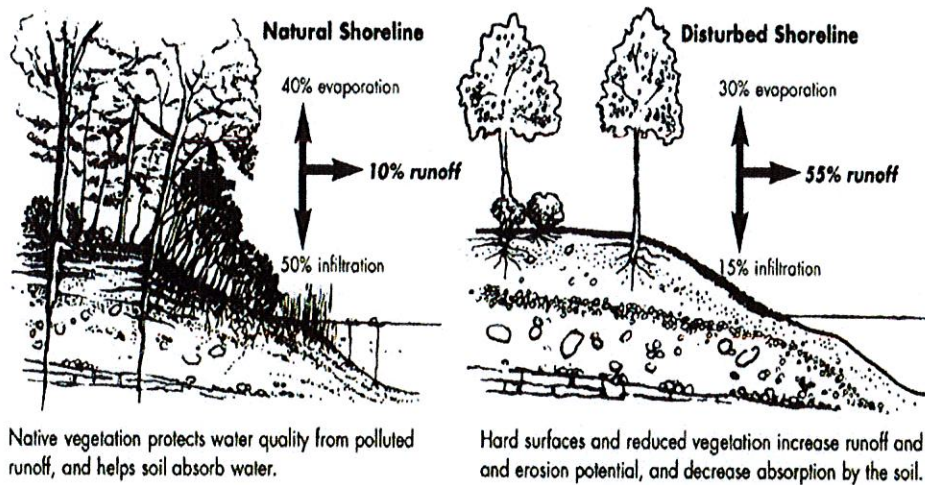
These sites have been cleared to develop the area for housing. The sites act as a significant drainage corridor from the upland area. It is evident from the vegetation and topography that this area experiences high amounts of spring run-off. When there is little vegetation in drainage areas it leads to an increased amount of flow downstream and sediment run-off. Signs of erosion downhill in OS8 give us clues about this increased runoff due to reduced vegetation.



I highly suggest that a portion of this area be naturalized to native trees and shrubs. I've created a map on the next page that shows an area that would benefit from this. The best place to replant is in the low lying area that receives the most moisture. The benefits that this will provide are listed below:

- Increased privacy and reduced traffic noise for the residents surrounding this area.
- Increased wildlife and songbird habitat.
- Reduced spring runoff and flooding in the downstream area (shown in graphic on next page, note the runoff values).
- Reduced nutrient and contaminant flow to the lake which would help maintain lake water quality.
- Reduced mowing/maintenance work in this area.





The best way to start naturalizing this area is to select and mark off an area that you are willing to let naturalize. I suggest starting with an area 10-15 meters wide, and close to the entire length of the OS11, leaving a space at the end so that vehicle traffic site lines are not impeded near the intersection at the south end of the subdivision. Mowing in this area should be restricted so that native grasses and forbes can re-establish. This may result in a surge of Canada Thistles at first but these will eventually be choked out by native plants that grow naturally and are planted. I suggest planting Trembling Aspen, Red Osier Dogwood, Wild Rose and native Willow varieties. These plants will be tolerant of the seasonal variability in moisture on this site. These species will also spread naturally so that the area will fill in over time and choke out invasive plants. Planting these species in odd groupings (5, 7, 9) within the green zone shown on the map below will make the area look like it is naturally filling in with native shrubs. A great way to rouse interest in the community is to organize a tree planting day. This also reduces the cost of labour for installing new trees.





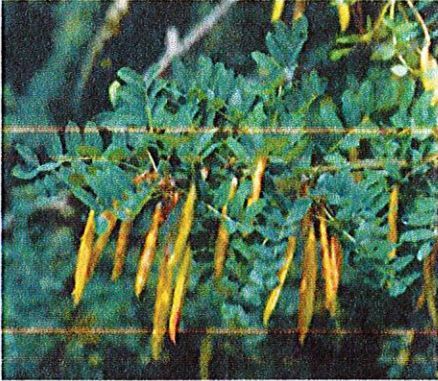
## **Conclusion:**

The Birchcliff open spaces are, for the most part, in good shape. The majority of the sites contain mature native stands of aspen parkland with sufficient wildlife habitat and food. There are several steps that should be taken to maintain the quality of these sites to help prevent further erosion problems and reduce the spread of invasive plants.

- *Himalayan Balsam*  
Ensure that the Himalayan Balsam on site OS15S is eradicated. This plant will pull very easily but may persist as seed until the next few summers. If this plant spreads on this sensitive area, major erosion may occur on this site.
- *Shoreline Prunning*  
Let maintenance workers and residents know that they could prune the Caragana and Lilacs on their properties to a height of approximately two meters. This will ensure that the soil still has some protection from precipitation and will also allow native vegetation some sunlight and moisture so that they can reestablish. Once the native vegetation has established the Caragana should be completely removed. Native plants on these sites should *not* be pruned. These plants provided much needed services to maintain the bank stability.
- *Naturalization*  
Steps should be taken to naturalize sites OS11, OS12 and OS13. Creating restricted mowing zones and planting the suggested native plants are great steps to increase the benefits that this area has on the surrounding ecosystem, including the lake.
- *Native Shorelines*  
The native shorelines in Birchcliff maintain the bank integrity in many ways. Efforts should be made to maintain the native vegetation on the shoreline. Homeowners should be educated about the effects of hardened shoreline structures and be dissuade from using this method.

### Non Native Invasive Species of Birchcliff

Caragana



Lilac



### Noxious Weeds of Birchcliff

Perennial Sow Thistle



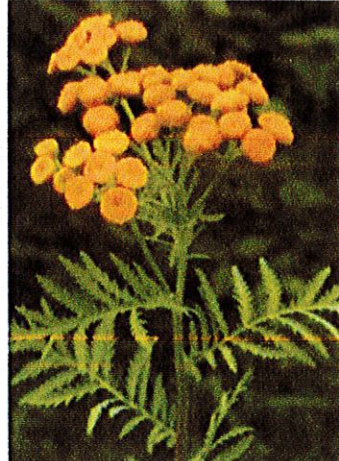
Canada Thistle



Creeping Bellflower



Common Tansy





## Prohibited Noxious Weeds of Birchcliff

### Himalayan Balsam

