Preliminary Review of Coastal Conditions at Woodland Beach
Tiny Township, County of Simcoe

August 10, 2008

the Coastal Centre

THE LAKE HURON CENTRE FOR COASTAL CONSERVATION

2008

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The Coastal Centre is an independent, non governmental organization dedicated to the conservation and wise stewardship of Lake Huron/Georgian Bay's coastal ecosystems..

Woodland Beach Site Visit
Tiny Township, Simcoe County
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Coastal Centre staff members conducted a site tour at Woodland Beach with Linda Lockyer and Elaine Stephenson, Woodland Beach Property Owners' Association President and Vice President and cottager Allan Crowe . This beach association was instrumental in organizing "Caring for Our Beaches" symposium held in Midland in 2007, and several issues related to beach management were identified at that time.

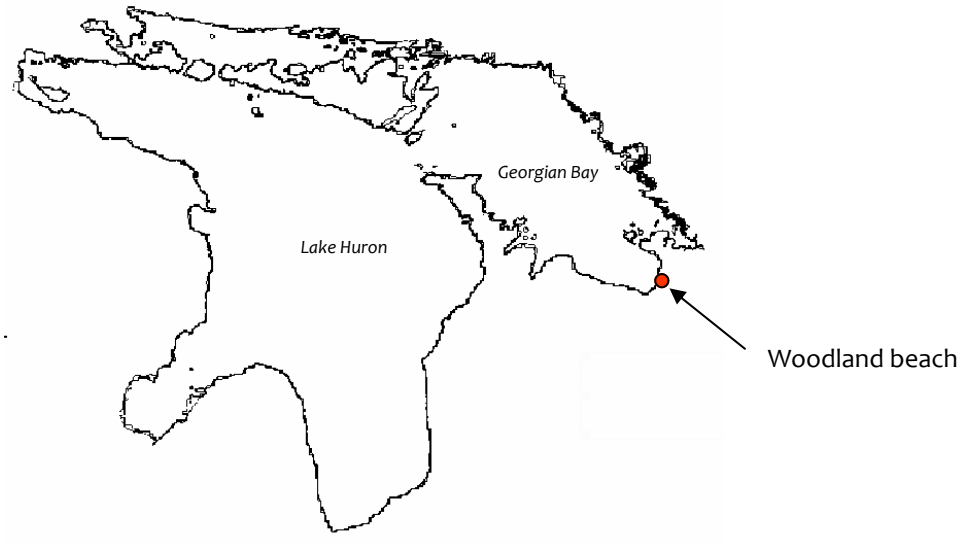
The variety of beach types was also discussed (sand, cobble, wet beaches and no beaches near bluffs) and is what, in part, prompted this site visit at the invitation of Woodland Beach Property Owners' Association. Since 2007, a Woodland Beach Park Master Plan (LGL Consultants) has been drafted and is currently under discussion.

Woodland Beach

This historic beach has served as a cottage community for residents for several generations. Approximately 10% of shoreline residents are full time residents while the remainder are seasonal cottagers. All cottages have no services, relying on individual septic systems and well water systems. A forested area borders the beach community on the east side and ranges from 0.5 to 1 km in depth. The mouth of the Nottawasaga River outlets into the bay approximately 3 km south of the south end of Woodland Beach. On-line mapping resources from Simcoe County show 3 distinct offshore, shore-parallel sand bars along much of the shoreline. These sand bars taper back to the shoreline at the north end near the bluffs north of Tamarack Trail.

The general configuration of Woodland Beach is a Headland-Bay shoreline. Headlands form where erosion resistant bedrock or lag deposits occur. Sand deposits occur within the embayment. At Woodland Beach, this type of shoreline appeared quite clearly, where the sandy beaches and dunes developed within the embayment, and more stony beaches occur at either end toward the headlands, or points. This is typical to this kind of shoreline type.

Boyd (1980) describes the sands in this part of Georgian Bay as being relic material, deposited during post glacial Lake Nipissing (6000 B.P.). While the beaches are dynamic and can exhibit short-term changes, the volume of beach material in this area changes very little over the long term, making the area relatively stable. Boyd notes that this stability is dependent on beaches not being altered by human related activities. Loss of stability can undermine the protective function of the beach during periods of high water and storm events. Indeed, loss of stability can lead to several negative effects noted in this report.




Bluff
King's Rock
Park
Creek
Stoney Point

The following is a brief description of our site visit and our observations.

Observations

We met at the Lockyer cottage which is located mid way on Woodland Beach south of Spratt Point and north of a point near the Tiny Flos Town line. Starting at the Lockyer cottage we walked south along the beach approximately 250 m. Due to low water levels, several patches of vegetation were examined and photographs taken. It was noted that a prominent headland (point of land) known locally as Stoney Point exists approximately 700 m south of the Lockyer cottage. This point seems to be unnamed, however, it appears to coincide with the south end of the municipality.

Below average lake levels has exposed more beach. The low gradient beach tends to be wet at or close to the beach surface. This "new" beach has exhibited a wide variety of wetland species, particularly in the wetter portions of the beach. While these plants have not been typical throughout Woodland Beach during the period in which cottagers have occupied the area, the plants are, for the most part, native wetland plants. The exception is the highly invasive Common Reed (*Phragmites australis*).

REACH #0 – 0 to 0.25 km south

Beach width – 40 m average to a maximum of 90 m at the Point

Property alignment – the intersection of three roads; Tripp Lane, Dutcher Drive and Tiny Beaches Road South creates triangular lots near the point. Elsewhere, the standard grid type lots exist similar to the lot arrangement to the north with 4 tiers of cottages. A well forested woodlot borders the area to the east.

Beach management – long stretches of wet beaches with evidence of vegetation attempting to take root exist along this reach. Some bull dozing of lake front lots is apparent.

Vegetation – large patches of Baltic rush (Juncus balticus), Silverweed (*Potentilla anserine*), sedge (*Carex spp.*), Bulrush. *(Note: vegetation noted in this report is preliminary. A botanical inventory of the beach has not yet been undertaken).*

Returning to the Lockyer cottage, we walked 1.5 km north and viewed several points of interest along the shoreline. We divided the shoreline into three segments using the following shoreline features:

0.5 km north – creek outlet onto the beach between cottage #2096 and #2100 and located approx. 60 m south of South Street

1.0 km north - The Township park (#2020) with parking and washrooms at the west end of Lawson Road

1.5 km north - King's Rock where the beach narrows and the bluffs begin

REACH #1 – 0 to 0.5 km north being the cottage to the creek outlet

Beach width - relatively consistent at 40 m widening to 50 m near the creek outlet

Property alignment – standard lot arrangement with shore parallel roads running back from the shoreline (Tiny Beaches Road, Park Road) establishing 4 tiers of cottages. Lots on the west side of Park Road are slightly larger lots.

Beach characteristics – several lots (approx # 2130 to #2146) appear to have limited vegetation and many lots bulldoze the sand away from their cottage. Embryo dunes are in existence and several cottages have dune grass well established.

Vegetation – American Beachgrass (*Ammophila breviligulata*) is the dominant dune plant where dunes exist. Areas where dunes have been altered by bulldozing exhibit a deflated profile compared with vegetated dune areas.

Deflated beaches have been identified as having higher potential for incidences of *Escherichia coli.*

These open areas are also vulnerable to opportunistic invasive plants, like Common Reed, Spotted Knapweed, White Sweet Clover and turfgrass (like Kentucky Bluegrass). These invasives have the capacity to alter beaches, including altering groundwater discharge, buildup of decaying organic debris and displacing native beach plants. All of these changes could negatively alter the health of the beach, and degrading its quality.

REACH #2 – 0.5 to 1.0 km being the creek to the Park

Beach width - ranges from 50 m near the drain to 30 m wide near the park

Property alignment – standard lot arrangement as described above in REACH #1 however a back lane exists between tier 2 and 3 providing access to the rear of the lots.

Beach characteristics – the reach 170 m south of the park appears to have a wetter beach with vegetation attempting to grow near the strandline.

Vegetation – Wormwood, milkweed, silverweed, willow spp., Baltic Rush, Jewell weed, and Blunt Spikerush. Blunt Spikerush is part of the Sedge Family, although it has a grass-like appearance. When Great Lakes recede, this plant commonly spreads to new areas of moist soil (beach).

REACH #3 – 1.0 to 1.5 km being Park to Tamarack Trail (just north of King's Rock}

Beach width - narrows to 20 m near the rock. Sand beach narrows and cobbles appear to armour the surface. Offshore boulders and rocks are more

prevalent leading some bathers to clear pathways through the stones to reach the sand bars in deeper water. Close to shore, we observed some rock lined shallow pools for wading.

Property alignment - north of the Park changes to a long, linear arrangement whereby several lakefront properties have secured road access through adjacent properties. This arrangement has not been successful in all cases and road access is not available to all cottagers. Roads that intersect the beach at right angles are Moore, Balsam, Hastings and Tamarack Trail. There are some notable luxury homes located along the shorefront of this reach (either side of the westerly terminus of Balsam Street at the beach).

Beach characteristics – a narrower beach exists with several rills of water flowing across the beach surface. Groyne-shaped rock piles appear in the water near the beach line opposite cottage #1950 Tiny Beaches Road South. The bluffs located immediately to the north of this reach are well vegetated and appear stable. We understand that the history of the shoreline bluffs was that prior to the 1970's the bluffs had sparse vegetation. Subsequently residents planted vegetation to prevent erosion. In 1986, due to high water

Cobble beach with sand veneer at the upper portion of the beach.

Nearshore cobbles forming a protective armouring of the shoreline.

levels, large boulders were installed with MNR permission at the base of the bluffs also to prevent erosion.

Vegetation – Lower water levels have provided the opportunity for various grasses and rushes to occupy the gravel beaches. Aside from Common Reed, plants observed were native. Higher levels will likely eliminate many of these plants from the beach.

General Observations and Concerns

In general, where cottages were developed at the top of the dune, dune management appears to have been practiced and vegetation appears to have been maintained (although this was not universal). Generally where cottages were dug into the dune, dune management is missing and bull dozing sand dunes appears to be the normal practice.

Evidence of "wet beaches" existed at different locations along the shoreline. They may be a result of excess septic runoff especially on poorly maintained beaches where heavy equipment use has deflated the beach elevation. These conditions may also be exacerbated by improper road runoff and roof drain outlets.

Sand supply to the beach appears to be restricted despite the occurrence of a river outlet to the south (Nottawasaga River 3 km south) and bluff erosion potentially to the north (Spratt Point).

Stewardship Recommendations

In general, there are two main stewardship themes worth pursuing at Woodland Beach.

Beach Stewardship – efforts to heal Woodland beach through restoration efforts would help Woodland Beach's overall sustainability. As discussed earlier, Woodland beach is comprised of relict sands which were deposited during the Lake Nipissing period 6000 years ago. There is a delicate balance that is being compromised by poor stewardship practices, like the removal of dune vegetation, and the mechanized alteration of dunes.

Recommendation – If it is possible, recruit a cottager who has practiced poor stewardship practices to undertake a demonstration project intended for sand management and the control of sand drifts. Beach Association members could volunteer to assist with beachgrass planting and sand fence installation. The Coastal Centre can provide awareness signs to help promote education and awareness. This could be framed as a project of the Association to support a fellow member with sand control issues. A demonstration project will allow other cottagers to witness the progress and results, and encourage others to consider similar measures.

Cottagers can do a number of simple things to better protect the health of the beach.

- *Avoid removing dune vegetation. Without these protective plants, the sand will be vulnerable to wind erosion.*

- *Grading beaches and dunes flat expose you to greater sand erosion and drifting, and deflates the beach profile risking greater exposure to E. coli bacteria. Practice stewardship measures that work to sustain a healthy and stable beach.*
- *Sand drifts can be avoided by installing sand fencing in combination with planting American Beachgrass.*
- *The Coastal Centre has a number of stewardship resources to educate and assist cottagers with beach and dune conservation.*

Beach Vegetation—The plants observed on Woodland Beach (other than the true invasives, like *Phragmites*) are native plants that have arrived in response to lower lake levels. This is a normal part of the beach ecology. The sedges, rushes and grasses are in the wet swales and parts of the beach not subject to regular storm wave activity. Many low gradient beaches like Woodland have these plants currently. People may not be used to seeing them because up until 1999 Lake Huron has had above average levels and the waves have kept this vegetation in check. The 'new' natives are what biologists refer to as opportunists and have occurred as lake levels have remained below average for so long and the wide open beaches have provided a suitable environment for them. They may not have been observed during the low levels of the 1960s as the levels did not stay low for as long a period. They likely would have been present in the 1930s when low levels lasted for over a decade. It may be too, that beach deflation resulting from poor dune management practices have lead to a lower gradient beach that provides suitable habitat for these natives that prefer moist sand.

Gravel beaches at Woodland Beach provide armouring and stability to this part of the shoreline. This protective armouring is more than simply the beach that we see standing on the beach. It includes the nearshore lakebed beneath the water that extends a distance into the bay. (to about a 2 to 3 metre depth). Removing the rock (sometimes

referred to as 'lag deposits') for whatever purpose can leave the beach vulnerable to erosion. It is possible that the removal and rearranging of the rocks to form the shallow pools has altered the protective stone layer and changed the nearshore currents which could provide a niche for algae deposition along the shore. These rocky areas can also be important habitat for fish, invertebrates and shorebirds.

Recommendation – Educate members about the significance of cobble beaches and their role along the coast. Not only do they provide habitat for numerous plants and animals, but they provide important armouring of the shoreline that helps protect cottages during high lake levels and storms. Removal of the armouring can create erosion conditions.

Invasive species – Invasive plants like Common Reed, Spotted Knapweed and White Sweet Cover, as well as turf grass from adjacent lawns, are encroaching into beach and dune areas, displacing native plants and altering the ecology of beach and dune systems. Common Reed is particularly problematic. It is a recent invasive, and has quickly become one of Canada's top invasive plants. Invasive plants take advantage of openings in the landscape caused wither naturally or by human disturbances. In the case of Common Reed, low lake levels have provided the initial opening for the plant to invade beaches, but human activity has been a large contributor to its spread. Removal of sand dunes has altered the beach profile, lowering the ground surface closer to the water table thus providing a moist environment for these invasive species to monopolize.

Spotted Knapweed, White Sweet Clover and other invasive plants colonize disturbed areas of beaches and dunes. Managing healthy

populations of native dune plants (particularly American Beachgrass) can prevent the introduction of invasive plants. Practices including mechanized beach and dune alteration provide an open invitation to invasive plants.

Turfgrass (like Kentucky Bluegrass), and other 'escapees' from urbanized landscapes, represent another form of invasive plant that can displace native beach and dune plants. In areas where turf grass is invading the beach and dunes, a dune grasslands buffer needs to be established between the turf lawn and the beach.

Invasive plant control should be a priority. This includes the safe removal of existing invasive plants, and embarking on dune restoration efforts to benefit the sustainability and health of the beach. The best defense against the spread of invasive plants is good beach and dune stewardship.

Where efforts are undertaken to undertake control programs, they need to be done with care or the problem will worsen. There are a handful of approaches that have been used with some success by the Coastal Centre with respect to Common Reed. Early detection and management measures should be considered now, before the plant gets out of control. A field guide for Common Reed control has been prepared by the Centre and is posted on its website (www.lakehuron.ca).

Recommendations – Early detection and control measures are key to addressing the Common Reed infestation. Develop a local strategy to deal with current infestations. Various approaches are discussed in the Coastal Centre's field guide. Identify which approach seems most acceptable to the Woodland Beach community. The Coastal Centre is available to consult with regarding Common Reed control.

In areas where turf grass is the problem, a dune grasslands buffer needs to be established between the turf lawn and the beach. The cottager can also be encouraged to embark on a native landscaping program and the Coastal Centre has information that we can share with anyone interested in this approach. Conversion from an urban landscape full of non-native plants (some that are invasive and 'escape' from the property) to one that is more natural is an important objective. Native dune plants do not need fertilizer or irrigation, and they attract beneficial insects which prey upon pests, eliminating the need for pesticides. They improve water quality by filtering contaminated runoff, and reduce sand erosion by stabilizing the dune with their deep root systems.

Communicating Beach Stewardship

Woodland Beach Association played a major role in assisting with the 2007 "Caring for our Beaches" conference held in Midland. This workshop was an opportunity to bring community member together from within the Nottawasaga Bay area. Future events of this kind can help raise the awareness of issues, and bring forward local solutions . A number of these issues are more regional in scope, and will require the cooperation and participation of beach communities throughout Tiny Township. Given the geographic proximity of Wasaga Provincial Park to Woodland Beach, there may also be opportunities to encourage a partnership to exchange information and education regarding beach and dune stewardship.

References:

1. www.maps.simcoe.ca

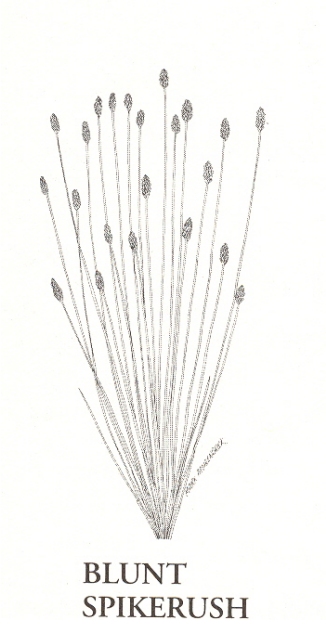
2. Baird Report – Review of Dynamic Beach, Shorelines of Tiny Township

3. Environment Canada, Environmentally Sensitivity Atlas, Lake Huron

4. Boyd, G.L., 1980. "Great Lakes Erosion Monitoring Program" , Manuscript Report Series No. 12, Department of Fisheries and Oceans, Canada.

Selected Plants Observed at Woodland Beach

August 10, 2008



Troubleshooting Issues Faced Living with Dunes

The Issue	The Steward's Solution	Why Is This A Solution?
1 I have no choice but to go through the dunes to get to my home!	▪ Minimize the width of the path you use. ▪ Mark your path with a temporary structure, such as poles or a rolling boardwalk. ▪ Share a path with your neighbours. ▪ Avoid driving through the dunes at all costs. Instead, use a wheel barrow or cart to move larger objects. It's better exercise.	Dunes continually shift in response to forces of wind and water. Therefore, it is best to access dunes using a temporary path that can be readjusted as dunes shift over time. Driving and even *walking* on the dunes easily damages and destroys **native dune plants**, creating blowout areas where loose sand is blown inland or swept away by waves. Vehicle use can also create ruts for **invasive plants** to establish.
2 Sand is taking over my yard!	▪ Return clean sand that is clear of weeds to the beach, rather than trucking it away. ▪ Use **native dune plants** for landscaping.* ▪ If the beach and dunes have little vegetation, consider planting native dune grass on the upper beach.** ▪ Avoid maintaining turf grass directly adjacent to dunes. ▪ Curve your path to the beach.	Unlike many common landscaping plants, **native dune plants** can handle being buried by sand, allowing them to trap sand carried by wind. The roots of these plants literally hold sand in place. When native vegetation is removed, loose sand is free to be blown further inland and deposited in your yard. Paths running perpendicular to the shore create a channel for sand to be blown inland. However, curving your path can prevent this situation from occurring.
3 Sand is burying my garden plants!	▪ When selecting garden plants, try to mimic nature by selecting **native dune plants** characteristic of your area.* ▪ Place garden beds close to your home and avoid landscaping directly beside the dunes.	You live in the presence of a unique **ecosystem** that supports some highly adpated plants. Celebrate this by learning about these plants and appreciating the natural beauty they bring to your property. By using **native dune plants** you select those that will not only grow well in a sandy environment, but also bind sand in place, preventing it from blowing into your yard.
4 There is less sand on my beach than there used to be!	▪ Recapture sand on the beach using a **sand fence.** ▪ Plant native dune grass on upper regions of the beach to hold sand in place.** ▪ Avoid removing plants from the beach to make room for recreational activities. ▪ Avoid placing permanent objects, such as docks or walls, on the beach or **foredune.**	Sand is continually exchanged amongst the lake, beach and dunes by wind and waves. Dunes act as a sand reserve to maintain a balance in this exchange. Without vegetation dunes lose their ability to hold sand and the balance is thrown off. When the balance is disrupted, sand on the dune and beach is easily eroded and swept away. Permanent objects on the beach can also disrupt sand exchanges and alter wind patterns that may enhance sand scouring.

5 My beach is becoming wet and mucky!	• Recapture sand on the beach using a sand fence. • Plant native dune grass on upper regions of the beach to hold sand in place** • Have your septic system checked. • Avoid using fertilizers near the beach and dune area.	Beaches can become wet and mucky when the soil quality changes. Soil quality is altered when a surplus of nutrients enters the dunes and beach, such as those released from overflowing septic systems or fertilizers. Changes in soil quality also create an opportunity for invasive plants to establish. By working to maintain sand and natural vegetation, you are also working to maintain soil and overall beach quality.
6 Vegetation is taking over my beach!	• Make an effort to keep recreational and leisure activities on the lower beach. • Let native plants be. • Learn about these plants and enjoy the natural beauty they bring.* • There is a chance you may have a problem with invasive plants. See below.	Do not be fooled by the images of plant-free beaches that you often see in resort brochures. Beaches are places where plants *must* grow. When a beach lacks vegetation, such as at those resorts, it takes a lot of effort and money to maintain. By allowing natural vegetation to grow, you are allowing the beach to take care of itself as it has done historically, while investing in the future health of the land.
7 Weeds are taking over my beach!	• Refer to a plant guide to ensure that these plants are invasive.*** If so, remove them by gently digging up the roots. Take care to not disturb native dune plants. • Avoid maintaining turf grass directly beside the beach and dunes.	When turf grass is maintained too close to the dunes, it creates the opportunity for common weeds to "escape" into the beach and dune area. Not only do these weeds change the appearance of the beach, they can also prevent native dune plants from growing.
8 Vegetation is blocking lake view!	• You may have a problem with an invasive plant known as common reed (*Phragmites australis*), refer to a plant guide to be certain. • If this is the case, you may want to consult with your municipality on how to deal with the issue.	*Phragmites australis* is a highly invasive plant that can grow in damp areas on the beach. It can change the face of your shoreline entirely by growing in tall, dense mats, and is very difficult to remove once established. A good way to prevent this plant from invading your shoreline is to allow native plants to grow by minimizing the areas of the beach and dune that you disturb. In doing so, you are contributing to a healthy dune ecosystem and enabling it to take care of itself.
9 Dunes are blocking my lake view!	• Allow this change to occur. • Consider building a balcony off your home or cottage. • Enjoy the lakeview by spending time on the beach.	Altering dunes can easily lead to more trouble in the long run. Dunes form in response to powerful forces of water and wind. By removing a dune, you are destroying your property's best defence against these forces and making your land far more susceptible to erosion.

*For a list of native plants for landscaping near dunes see page 11
**For information on how to plant dune grass see page 9 and 10
***For a list of invasive plants of the dune ecosystem see page 12