Hespeler Village River Activation

Newsletter No. 1 ***December 2002***

Map of the Study Area

This is the first of three newsletters that will be produced for the River Activation Master Plan project. If you wish to receive the future newsletters, please email or phone Albert Flootman (contact information on the back page), and we will include you on our mailing list. Please indicate if you would like to receive a printed copy, or an e-mailed version. Public input is an important part of the process and we want you to be aware of the latest developments.

What is the Hespeler Village River Activation Master Plan?

The objective is to develop a Master Plan that recommends specific revitalization projects in the Speed River corridor aimed at improving the social, environmental and economic well-being of the Hespeler Village core area.

This project is part of the Cambridge Core Areas Revitalization Strategy that includes various programs for the core areas such as parking improvements, streetscape upgrades and financial incentives for redevelopment and building improvements.

What has happened to date?

The following list is a summary of what has happened up to this point.

- Environmental testing undertaken in 2001
- Terms of Reference approved by Council in May 2002
- Steering Committee formed in May 2002
- Consultant appointed by Council in July 2002
- July and September – organizational meetings
- September 18, 2002 – First Public Consultation

- October, November 2002 – Stakeholder interviews by consultant, ongoing background research into issues identified at public meeting
- October 30, 2002 – Steering Committee meeting
- November 7, 2002 – Visioning Session with Steering Committee

What is the Steering Committee?

The Steering Committee guides the development of the River Activation Master Plan, and reports to Cambridge Council.

Cambridge Council approved the composition of the Hespeler River Activation Steering Committee when the Terms of Reference were approved in May 2002.

Members of the Steering Committee represent the three neighbourhood associations adjoining the study area, the Hespeler Village BIA, the Hespeler Business Community, the Hespeler Healthy Community Coalition, the Core Areas Revitalization Advisory Committee, and other City advisory committees and departments.

Who is the Consultant?

The City of Cambridge hired EDA Collaborative Inc. to complete this project. The principals of this firm are Patrick Li and Bruce Cudmore. Their Project Coordinator is Lara Tarlo. Other study team members are: Uwe Wittkugel, Senior Environmental Planner at EDA; Peter Meyer, a tourism consultant; and, Tye Farrow, an architect.

EDA is responsible for background research, public consultation, and the development of the Master Plan under the direction of the Steering Committee.

What's coming up?

At this point, interviews with key stakeholders are being completed, the Mill Pond sediment issue continues to be discussed, and the consultant is developing different ideas for improvements within the study area based on the input received from the public and the Steering Committee.

The next public meeting is scheduled for January 9, 2003, in the Beehive Room at the Hespeler Arena on Ellis Road. This meeting will include presentations by the consultant about the work done to date, and small group discussions to reflect on what has happened and to develop new ideas for improvements.

The Hespeler Mill Pond and Sediment

In early October, the consultant and City staff met with Grand River Conservation Authority staff to discuss the sediment issue. Around the same time, the Cambridge Rowing Club presented concerns to Council that the closing of the sluices in the Parkhill Dam has caused the Grand River to silt up, affecting the dock used by the Rowing Club.

This issue is being looked at closely by the GRCA. We don't have any answers from them yet, but included as part of this newsletter is some information about dams – what they are, why they are built, and how they affect rivers.

INFORMATION ABOUT DAMS

1. The purposes of dams

In the early days of settlement in Ontario, dams were built to create mill ponds. These mill ponds provided a steady flow of water to turn water wheels to run saw mills, flour mills, and other early industrial machines. With the introduction of steam engines, and later, electric motors, water-driven mills became less common. This early industrial legacy has left us with dams and mill ponds that now serve aesthetic and recreational purposes.

Contemporary dams in Ontario are built and maintained for three main purposes – flood control, the generation of hydro-electricity, and for water supply purposes, to maintain river flows throughout the summer months. Where surface water is treated and used for drinking water, reservoirs may be used to provide a more reliable source of water. In some areas, the reservoirs (ponds) behind dams provide a source of water for irrigation of farmland.

Flood control involves holding back large volumes of water (from snow melt in the spring and from storms throughout the year), and using sluice gates near the bottom of the dams to release water gradually to prevent a rush of water that would cause flooding downstream. The gradual release of water also allows river levels to be maintained over the summer months, when rivers through developed areas would otherwise be reduced to a trickle.

The speed of the water released from the dams can also be used to turn turbines to generate electricity.

1. Types of Dams

Most dams in the Grand River Watershed have three main parts:

- an earthen embankment which is designed to hold back water
- a concrete section that is used to pass water over or around the dam, while dissipating enough energy to ensure that the dam is not damaged
- outlet works which consist of gated sluiceways, stop logs, etc., that allow the dam owner to control the amount of water that goes through the dam.

In addition to these earthen dams, there are several "run-of-the-river" dams, which consist of a concrete or timber crib (mostly concrete now) weir across the river. The weir serves the dual purpose of raising the elevation of the water surface above the dam, and dissipating energy as water goes over the dam. The Parkhill dam is a classic example of a run-of-the-river dam. A common characteristic of a run-of-the-river dam is that the flow of water into the pond area and the flow out are equal most of the time, whereas dams that that have large reservoirs are usually operated to store the spring runoff from melting snow and rain, and release over during the summer months. In the case of a dam with a large reservoir, the amount of water going in balances with outflow on a year-over-year basis, but not on a day-to-day basis.

2. Dam sluices – what they are and what they do

Sluices are underwater openings near the base of a dam that allow water to flow through the dam. When controlled by steel gates, sluices can be closed. Opening the gates allows the gradual release of water to maintain river flows even when the water level is below the top of the dam. This is important for dams that are used to store water from spring snow melt, to maintain an even flow of water throughout the summer months.

4. Sediment

What causes it?

There are two main sources of sediment: soil erosion (from stream banks and farm fields); and decomposition of algae and plants growing in or near the water. Also, uncontrolled sediment from construction sites has potential to accumulate in streams. If sediment is mainly from soil erosion, it will be "mineral" in nature. If it results from the decomposition of algae and plants, it will be "organic", with high levels of phosphorus and nitrogen. When "organic" sediment decays, it will tend to have an odour that is especially noticeable in hot weather.

Sediment builds up in mill ponds because the flow of water is slower than it is in rivers without dams. The total amount of water flowing downstream doesn't change, but because the river has been made wider, the water does not move as quickly, and more material settles to the bottom.

Rainfall is another factor that must be considered. Drought conditions result in low river levels (even immediately upstream of the dams), and may contribute to a perception that there is more sediment accumulating behind the dams. Even a water depth reduction of a few inches may affect river users.

What can we do about it?

Opening the sluices in dams will only get rid of the sediment for a short distance upstream of the dam. The real culprit is the slow moving water that allows sediment to settle to the river bottom. The problem is made worse when more plants and algae grow in the river, then die and settle out on the bottom.

Short of removing a dam to restore a channel to its natural width, a possible solution is to make the channel above a dam deeper and narrower, and to create naturalized wetland areas to the sides. The faster flow in the channel will at least reduce the rate of sediment accumulation, and the plants that grow in wetland areas will help to improve the quality of the water by using up the nutrients in the sediment (the nitrogen and phosphorus).

There may be other viable solutions to improve the situation. Addressing the issues may include the introduction of different plant and fish species to improve water quality and break the cycle of plant decomposition.

5. Hespeler Dam

The Hespeler Dam, also known as the "Jacobs Landing" dam, is located at the millpond in Hespeler. The City purchased it, along with the millpond itself, from American Standard in the late 1970s. Based on historical information, a dam existed at this location prior to 1904. The dam was rebuilt in 1987 by removing the top of the original granite structure, and constructing a new concrete dam on the downstream side.

6. Dams in the Grand River Watershed

The Grand River Conservation Authority operates 32 dams. Seven of these provide flood control and augment low river flows in the summer. Two of these large dams are over 45 years old. Behind these seven multi-purpose dams, water is collected in reservoirs during the spring runoff period, and discharged during the lower flow periods in the summer. Water from the reservoirs is used to meet flow targets in the Grand River. On three of the dams, some of the water is run through turbines, to produce hydroelectric power.

So, dams typically have three main purposes: flood control, water supply, and hydroelectric power production.

Water from the Grand River is used for drinking water in the Region of Waterloo, the City of Brantford, and Six Nations. Water from the multi-purpose reservoirs also dilutes effluent from the sewage treatment plants along the river. At times in the summer, up to 90% of the flow in the Grand River is from the reservoirs. The reservoirs are operated to keep the river flowing. Without the flow from the reservoirs it would be difficult for municipalities to meet their requirements for discharging effluent from their sewage treatment plants. The reservoirs have a clear and critical role in the operation of downstream sewage treatment plants, and water taking facilities.

Controlling the flow of water also provides a way of reducing flood damage throughout the watershed. The annual flood damage avoided through the operation of the reservoirs is approximately $2,400,000. Continued public safety in the flood prone areas depends on a well maintained, and functional flood control system. Failure to maintain the multi-purpose dams could lead to dam or dyke failure, resulting in the significant loss of life and significant property damage. Improperly maintained dams compounded the Saguenay Flood in 1996, Canada's first billion-dollar disaster.

7. Dam Operations – Laws and Regulations

The operation of dams is affected by a number of provincial and federal laws and regulations. Some of them are:

(a) *Fisheries Act* – sections regarding maintenance of flow, deleterious materials, fish passage, fish screens, protection of fish habitat, and authorizations;
(b) *Conservation Authorities Act* – measures respecting the floodplain and construction or the placement of fill in or adjacent to a watercourse;
(c) *Lakes and Rivers Improvement Act* – stages of approval respecting the construction and alteration of dams including discretionary powers to order certain work;
(d) *Proposed Ontario Dam Safety Program* – safety standards for all public and private dams developed in consultation with major stakeholders;
(e) *Water Management Plans, Ontario Waterpower Project* – sets operational requirements for water flows and levels at waterpower facilities; and,
(f) *Grand River Fisheries Management Plan* – provides direction on how the fisheries resources can be managed in the Grand River watershed, and how management tactics including removal of in-stream barriers could enhance this resource.

CONCLUSIONS

Dams provide functional benefits related to flood control and hydroelectric power generation, and aesthetic and recreational benefits. However, they may also have negative effects on water quality and the natural environment. Sedimentation is a frequent result of dam construction, caused by the slowing the flow of the river.

Opening sluices will generally only have a limited effect on sediment accumulation. Sediment will usually only be removed in localized areas where water flow is accelerated by the opening.

Low river levels (even immediately upstream of the dams) during drought periods may contribute to the perception that there is more sediment accumulating behind the dams. Lower flows may also allow more sediment to accumulate.

Who to contact for more information, or to provide comments:

Lara Tarlo
Project Coordinator
EDA Collaborative
(416) 362-2228
ltarlo@eda-inc.com

Albert Flootman, MCIP, RPP
Senior Planner
City of Cambridge
(519) 740-4650, ext. 4575
flootmana@city.cambridge.on.ca