Pollinator Park: The Pathway to Pollination Protection

Pollinator Workshops, March 7th & 8th, 2008, Guelph, ON

Prepared by Marianna Horn

Pollinator Park: The Pathway to Pollination Protection

Pollinator Workshops, March 7th & 8th, 2008, Guelph, ON

Prepared by Marianna Horn

Report to the City of Guelph

The Pollinator Workshops of March 7th and 8th 2008 were an overwhelming success. Over 120 guests from across the country participated on the first day alone. Throughout the event, internationally renowned speakers illuminated the world of pollinators to a very diverse audience. Participants included beekeepers, Master Gardeners, environmental consultants, academics, Non-Government Organizations (NGOs), Government Organizations (GOs) and many interested citizens of Guelph and the surrounding area, as well as researchers from other provinces.

A large audience was riveted to the guest speakers.

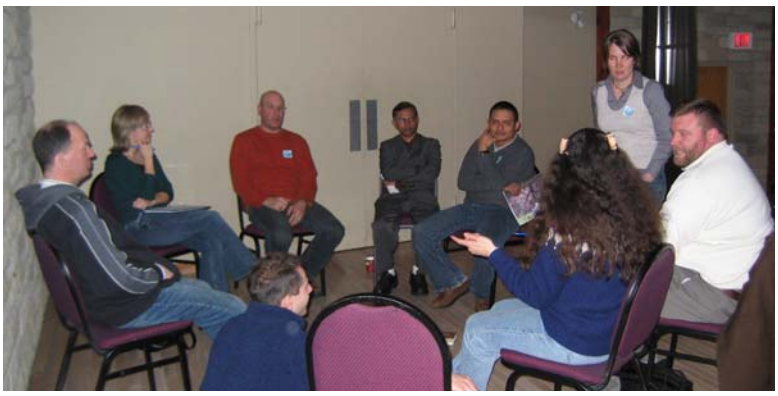
After a warm welcome from Mayor Karen Farbridge, the talks opened with an overview of the importance of pollinators, presented by Master's student, Marianna Horn and highlights of the Guelph Initiative, presented by Councilor Vicki Beard. Dr. Edward McBean then described the features of landfill sites, with emphasis on the mechanisms that maintain site integrity. Dr. Karen Landman discussed possible design options for a landfill site. Dr. Steven Handel, from Rutgers University, gave an overview of his ecological findings on restored landfills in the New York and New Jersey region. Finally, Dr. Julianna Tuell, from Michigan State University, discussed native plants and their pollinators.

Mayor Farbridge welcomes conference participants.

Following these talks, all participants in the conference were invited to break into working groups facilitated by Ms. Victoria MacPhail. The five working groups met and brainstormed for approximately two hours on given topics. Their main conclusions and recommendations for the city were presented to all participants in the workshop and are summarized in this report.

Group 1: Master Gardeners, Gardens and Pollination

The first group discussed the implementation of pollinator-friendly gardeners. They concluded that the best way to share the principles of a pollinator-friendly garden is to show by example. The city should establish policies that provide for pollinators, educate the pubic on the importance of pollinators, demonstrate how to create appropriate environments and provide incentives for doing so.



Working groups met to discuss a wide range of topics.

The city should establish a municipal policy for pollinator-friendly green spaces. The City's naturalization program should be revisited to allow increased natural regeneration and thus reduce the areas that are maintained. This could include exhibition parks to demonstrate pollinator habitats. It would also be advisable to create some exclosures within the green spaces to protect these habitats from being walked upon.

The city should also clarify and update their bylaws to accommodate pollinator-friendly plantings. This includes creating pollinator-friendly bylaws for new developments (residential, green, commercial

and industrial). These bylaws should require a pollinator-friendly native plant component in site plantings, and should ensure an extended bloom period to accommodate both early and late season pollinators. It would also be beneficial to retrofit existing spaces to improve pollinator habitats and resources. For example, the Hanlon Parkway could be improved in a manner similar to the Niagara Parkway.

To continue with public education beyond the bylaws and the example set in public green spaces, the plight of pollinators needs to be delivered to the public. Existing pollinator initiatives need to be identified. Where they are lacking, other initiatives can be established, including, for example, a honey festival for public outreach. With the pollinator park, interpretive signage and trails should be used to inform the public. A trail or walk should connect key pollinator friendly areas.

Special interest groups such as the Master Gardeners or horticultural societies can do presentations to promote information on pollinators and their needs. Target audiences must be determined. These should include neighbourhood associations, schools (to start education at a young age), local nurseries (to help them provide appropriate plants). The purpose of these presentations should be to provide positive propaganda for pollinators. They should also dispel the myths surrounding stinging insects, "weeds", rats and "messy" gardens. (Many bees don't sting; many so-called "weeds" are non-invasive wildflowers; rats are not encouraged by underbrush; and a certain degree of underbrush is beneficial as it provides pollinator habitats.)

Once it has been established amongst the public that pollinators need help, there will be a need for examples that citizens can follow in order to improve the pollinator-friendliness of their gardens. These should include a Pollinator-Friendly Garden Tour, and demonstration gardens such as Gosling Gardens. The city website could provide information on both private and public demonstration

gardens. A pollinator-friendly theme should be chosen for Communities in Bloom. There should also be a competition for pollinator-friendly gardens. Ideally, a city coordinator could be established to deal with pollinator friendly activities, but even if this is not possible, it is necessary to provide professional development for city staff, especially groundskeepers and park staff, to ensure their familiarity with pollinator-friendly environments. With these and the aforementioned bylaw amendments, the City of Guelph could be established as a role model for pollinator-friendly policies, bylaws, and green spaces (both public and private).

Incentives to encourage citizen participation could include subsidies for pollinator friendly plants, tax rebates, competition prizes, and recognition with certification programs, awards or free products, such as bee nesting boxes. Promotional events at nurseries and neighbourhood plant exchanges would also act as encouragements.

Group 2: Education and Recreation

Group 2 expanded on the theme of education discussed by Group 1. This work group focused on the formation of an education partnership that would include all types of education. They also discussed the promotion and implementation of this education, and suggested that an ecological lens should be used to steer decisions made concerning recreation.

The education partnership suggested by this group should include all related interest groups and primary landowners in the area. Interest groups such as the Arboretum, Master Gardeners, beekeepers, Grand River Nature Conservancy, Guelph Field Naturalists and Royal Botanical Gardens can provide information to the City of Guelph (especially the Parks and Recreation Department) and Wellington County, to the county school boards (to educate for the future), to Guelph Lake, to the Guelph Ski Club

and to the Ontario Hospital Association. This information should also be provided to nurseries so that they can provide the appropriate native plant and seed sources.

A wide variety of types of education should be used in an effort to reach as many audiences as possible. A good first step is to ensure that both pollinator and plant guides are available. Booklets of what plants promote pollinators and where they can be acquired would also be very useful. Visits to gardens that are set up to be pollinator-friendly would also be beneficial. It is also essential to provide education at a young age to ensure the promotion of pollinator protection by later generations. This requires curriculum developments and teacher resources in addition to the resources available to the project. Students would also benefit from classroom visits, field trips, and hands-on activities. It is also important to promote the fact that not all bees sting to try to nullify one of the most detrimental negative associations that people have with pollinators. Finally, signage on trails at the Pollinator Park, including outdoor booths, trail guides, and native plants and pollinator sheets would be effective means of incorporating education into recreation.

In order for the education to be useful, people need to know that it is available. Therefore, the promotion of available materials is extremely important. A page on the city website would be a good way to reach the public, especially if it were linked to the tourism page. Information should also be provided through the local newspaper. Ideally, a column could be run weekly providing information on pollinators. Finally, a large push of promotion, like a pollinator week (as seen in the United States) would be very good to support education. Pollinator Week could include booths, a pollinator-friendly garden competition, and activities like a scavenger hunt.

People need to have a means to implement the education they receive. This means that providing for pollinators has to be easy, affordable and fun. People will need access to appropriate plants and seeds,

and therefore, there needs to be local provision of Ontario varieties of native seeds. The city will also need access to these sorts of plants for parks. Planting of community gardens could also help spread pollinator-friendly practices, via education by example.

Momentum must be achieved if the education provided is to have lasting effects. The ultimate goal of the education should therefore be to create a passion for pollinators. This will give rise to ongoing education, and will also provide a reason for people to participate. This means that activities like the aforementioned Pollinator Week should become annual events. Another suggested event is a picnic at the Pollinator Park, so that people can see the designated pollinator space.

Primary schools are another good place to work in order to ensure annual continuum of events. School projects including pollinator friendly gardens or monarch butterfly observations are both educational and entertaining. If possible, it would be good to get schools out to see the Pollinator Park, or other pollinator habitats, but this might not be feasible due to the high cost of such excursions.

Because the primary goal in the creation of the Pollinator Park is to protect pollinators, it is essential to monitor the park as it develops. The abundance and diversity of pollinators should be carefully assessed before, during and after the creation of the park. Citizen scientists, using programs such as "Pollinator Watch", can assist in the monitoring of the insects and flowers. This allows community members to use the education they have received to contribute back to the science.

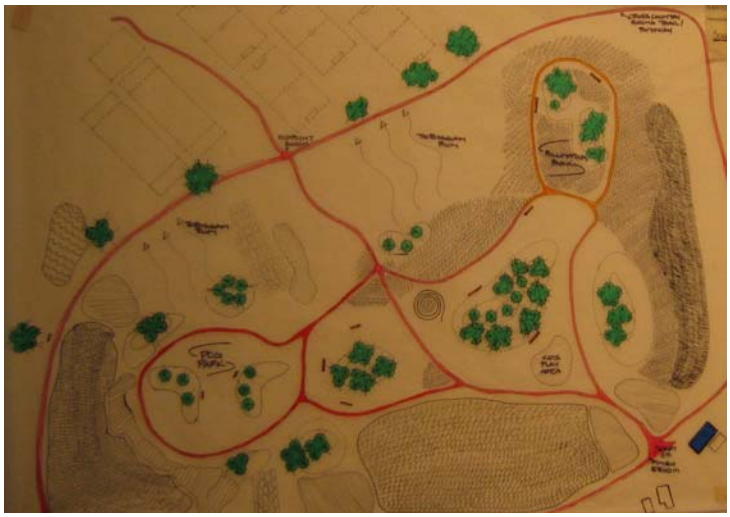
In making all decisions regarding the recreational aspects of the park, it is important to have an ecological theme. This promotes a cohesive perspective and avoids contradictory, or even hypocritical, choices. This filter can be used to make decisions concerning all aspects of the park, from whether or

not to use composting toilets and how to deal with garbage, to what kind of interpretive trails and signs will be available and what media resources will be used.

Group 3: The Bioengineering of the Pollinator Park

The third group discussed the bioengineering of the Pollinator Park. Important aspects of the site were reviewed and areas that need to be investigated before planning can go ahead were identified. Consideration was given to important elements in the design, the timing of development, the site-preparation and the long-term management. Means by which to encourage public involvement in the bioengineering were also discussed.

The Eastview Landfill Site contains some features that make it a unique site. For example, there is a low area that has not been filled. This area fills with water during the spring. Because this is a landfill site, it is also surrounded by a series of ditches that carry away the water that runs off the cap. These features need to be taken into consideration in the design, as it may not be possible to pool water elsewhere on the site. The site is adjacent to some provincially significant wetlands. It would be beneficial to make some sort of connection or transition between these wetlands and the Pollinator Park site. Because of its height, this site also offers an interesting view of the city, which is significant from a cultural perspective. Overall, the Pollinator Park holds the potential to offer a very rich educational site for environmental conservation and rehabilitation. If properly created and maintained, it will be beneficial to many pollinator guilds.



Designs from a charette showing possible plans for the Eastview Landfill Site were presented at the meeting.

Although there has been consistent monitoring of this site for some time because it is a landfill site, there are a number of large gaps in the information available. It is important to have information on the wind direction and strength, the microclimate and the hydrological regimes. Soil tests and surface water tests will be necessary, as well as a full set of baseline data on the abundance and diversity of the flora and fauna of the area. Finally, the social and cultural perspectives should be taken in to allow for an educationally appropriate design. This information needs to be collected, compiled and analyzed to determine which aspects can be changed, which should be preserved, and how each should be accommodated.

The design should include a number of features. It needs to include water sources for the pollinators such as ponds, ditches and other catch-basins. Pollinators also need nesting spots including stones, pithy twigs, logs and rough bark. Various types of habitats should also be incorporated in a mosaic design. These should include, but not be limited to, tall grass prairie mixed-grass prairie, low meadows, shrubs, old fields, incipient forest, forest edge, and wood/forest. The latter two will require further investigation of the potential to plant trees on capped soil. Soil minerals, sand, compost, old logs and brush should be added in order to fit the requirements of the flora planned for these habitats. The wind must also be taken into consideration to allow for both windy areas and windbreaks such as bunched grasses.

In order to ensure success of the design implementation, it is obviously important to plan ahead and to be aware of the time required for each step. This planning should include time for trial plantings and site preparation. These trials should include various techniques of cropping in order to determine what works best for the given site. Site preparation may also require sterilization of some areas to get rid of the seeds and plants of aggressive species. Round-up ready soybeans and no-till crops were suggested

as nursery crops to be followed by early-successional native plants. Seeds and plugs will be needed in synchrony with the completion of the site preparation to ensure that unwanted species do not have the opportunity to establish themselves before the desired plants are in place.

For the continued success of the park, some management will be necessary. A certain level of invasive species control will be necessary. Wind and soil monitoring will be necessary to be sure that initial interpretations were correct. General monitoring of flora and fauna will be important for research purposes and to support the significance of the contributions of the park. It will also be necessary to have management of the recreational aspects of the park, including the trails, look-outs and sporting areas.

Because this park is intended for the public, it is important for them to be involved in its creation. The trails and natural playgrounds in the park will be available for their enjoyment, but this should not be the limit of their involvement. Making community gardens in close proximity (but not on) the filled land would be a good way to make use of the pollinators attracted to the Pollinator Park.

Group 4: Public Participation with the City and the Pollinator Park

The fourth group addressed public participation, and its role in the success of the Pollinator Park. The recommendation of this group was to establish a government body to ensure that public input can be collected and applied in a useful manner. This would require a striking committee to produce a steering or advisory committee to put together a master plan, particularly for use in fundraising and future direction of the project. The members of the advisory committee will then be able to manage subcommittees such as fundraising and volunteer management.

The primary purpose of the striking committee will be to create an advisory committee. The obvious candidates for this striking committee are those who were involved in the inception of the Pollinator Park, but should also involve others who are interested. The striking committee should establish the primary functions of the advisory committee and lay out important subcommittees. The striking committee needs to clearly establish the mandate and liabilities of the advisory committee. There should be a list of stakeholders and potential partners made and as well as people who would make strong contributions to the advisory committee. Once the advisory committee has been established, the striking committee is no longer necessary.

The advisory committee will be the main governing body of decisions related to the Pollinator Park and will serve to provide the City of Guelph with the best guidance possible. Their first job at hand will be to settle on a master plan for use in fundraising and further planning of the park. It is important that this body be separate from the City of Guelph for both funding and continuity purposes. However, there should obviously be some representation of the city on the advisory committee to ensure that City perspectives and plans are observed. Similarly, key stakeholders should be represented in this committee to ensure that their interests and aptitudes are taken into account. Stakeholders that should be considered include: Guelph Chambers of Commerce, Guelph Environmental Leadership (GEL), Wellington County Stewardship Council, Grand River Conservation Authority, the University of Guelph, Nature Conservancy of Canada, the Ontario Ministry of Agriculture Farming and Rural Affairs, the Ministry of Natural Resources, Guelph Hydro, community groups (such as the Master Gardeners and field naturalist groups), Rotary, other service groups, educators (from public and separate schools) and technical experts. The rest of the members of the advisory committee should be interested citizens who can make strong contributions and a strong commitment to the project.

Some suggestions were made for subcommittees and the subjects that they should address, including management, research, fundraising, finance, volunteer, and promotion. The management subcommittee would be responsible for the general management of the Pollinator Park – monitoring what is being done, and what should be done. This subcommittee should work closely with the research subcommittee, which will monitor the flora and fauna of the site before, during and after the construction of the park. The purpose of the fundraising subcommittee would be to acquire funds on a broad scale, while the finance subcommittee would determine what to do with the money. The volunteer subcommittee will determine how to accommodate and best use volunteers, while the promotion subcommittee will keep the public informed about the progress of the project.

The management subcommittee should tap into the expertise of local stewardship councils such as the Wellington County Stewardship Council (WCSC), the Grand River Conservation Authority (GRCA) or the Wellington County Society for the Countryside. Contacts such as Larry Halyk, who is familiar with both the WCSC and the Ontario Ministry of Natural Resources (OMNR), would be infinitely valuable. This subcommittee should explore different processes for adapting and enabling gardens. For the research subcommittee, the University of Guelph offers a convenient resource for experts in this type of monitoring.

Many suggestions were made for the fundraising subcommittee. They should try to acquire corporate sponsorship, which can be acknowledged through plaques. Corporations can be approached and asked if they have a green fund. They should also write a Trillium Grant application, using existing organizations, such as the Master Gardeners, for partnership and assistance. The park advisory committee should not pursue charitable status; if necessary, other organisations' charitable numbers can be used. Issuing tax receipts (via the City) for top soil and in-kind soil-moving equipment was another suggestion for fundraising. The dollar amount of the receipts can be used as "matchable" funds

in applications to foundations and to the province. It was also suggested that the seeds from the Pollinator Park could be harvested for use at other sites, potentially even sold. Research activities could also be used as a source of funding.

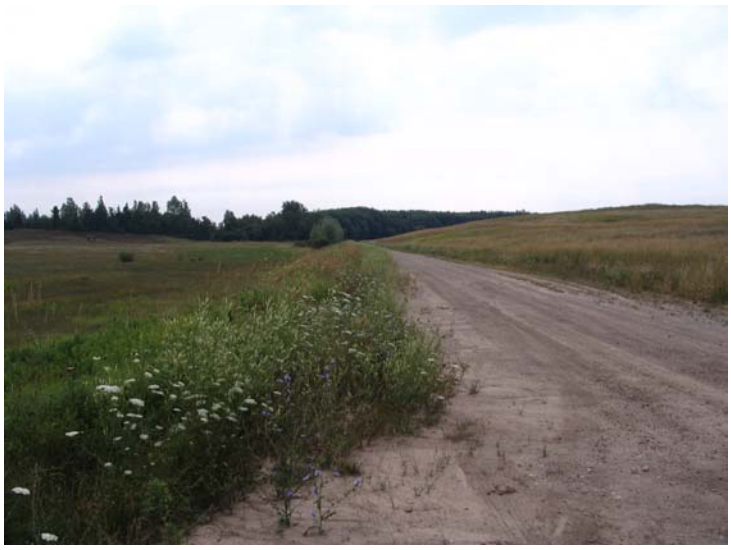
The finance subcommittee, like the management committee, would do well with advice from stewardship councils, in particular the WCSC. The primary directive of this subcommittee is to establish a stewardship fund for the long-term care of the park.

Volunteers, like the advisory committee, need to be coordinated through a separate organization from the city. Pools of volunteers could be recruited from a wide variety of different organizations, including Master Gardeners, field naturalists, university clubs, hikers, etc.. Human Resources and Social Development Canada (HRSDC) might be able to provide some funding to support summer jobs for students at the Pollinator Park, either as stewardship rangers, or as summer research students. Also, retirees might be interested in helping to keep an eye on the property. Golf carts could be provided to allow them to get around the park more easily.

The promotion subcommittee will primarily be oriented towards ecotourism, or the promotion of ecology through tourism. Promotion should also target school groups, and could use media programmes in Ontario to promote the Pollinator Park. An educational video about pollinators and pollinator-friendly gardening could also be effective tools. A documentary of the Pollinator Park "project" from pre-project to completion (before, during and after) would also be a good means of promoting the park. This documentary could be completed either as a local or school production, and could even be presented to the National Film Board.

Group 5: Biomonitoring of Pollinator Park Site

The fifth group reviewed biomonitoring of the Pollinator Park site. The purpose and goals of the Pollinator Park were outlined and the specifics of how these goals could be achieved through biomonitoring were discussed. Some specifics with regards to the research that should take place on the site were outlined and the expected outcomes of the biomonitoring were outlined.



The Eastview Landfill Site is the future site of the Guelph Pollinator Park.

The primary goal of the park is to promote native pollinators and, to a lesser degree, native vegetation. A byproduct of the promotion of natives is the control of invasives. Both these factors can be controlled by proper management of the site. This site will allow for continuous research by both the University of Guelph and the City of Guelph. Because this is the first known Pollinator Park in the world, it is important for the process and effects of the creation of the park to be carefully monitored to allow for replication in other sites. This site should also allow for development of improved pollinator gardening guidelines. It will allow the establishment of consistent sampling methods than can be used to monitor both pollinators and plants in a replicable fashion. Finally, the Pollinator Park is an opportunity to develop a culture that appreciates ecology, and should promote sustainable landscapes. This appreciation of ecology should allow further education of the public and will give rise to more information sharing. More educational resources should become available via an institution (be it the school system or the government) and this should allow the implementation of a neighbourhood Pollinator Watch. In turn, a cultural

appreciation of ecology would improve public outreach via annual public events, such as a Pollinator Festival.

In terms of the biomonitoring of the site, many decisions need to be made. It is essential to maintain consistency and continuity during the monitoring. For this reason, methodologies of evaluation must be recorded in great deal. These should include a formal process by which to inventory both vegetation and pollinators, and also by which to monitor disturbances. It is important to have a good concept of the resources that will be available over the long term to allow for reproducibility in monitoring. This information can also help in decisions regarding whether to monitor the whole park or only certain sites within the park.

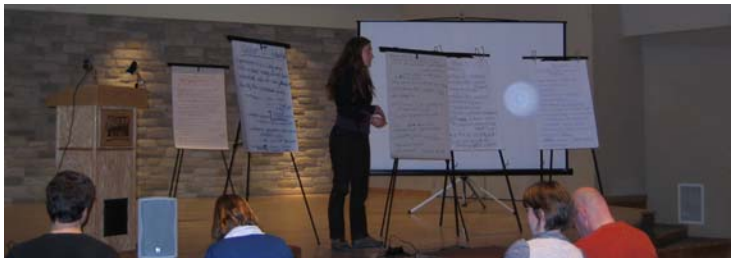
The data collected from the Pollinator Park will have strong repercussions on the continued support of the project and on enthusiasm towards other, similar projects. Solid data sets are the only way to demonstrate that the park is working to protect pollinators and thus to justify its existence. Therefore, the results must be used appropriately by stakeholders and partners. They must also be shared with involved stewardship networks, such as the Ministry of Natural Resources, Conservation Authorities, etc.. To make the data useful, it must be converted into visual information. Quantitative data must be collected. These data should be must be represented in an interpretive manner (e.g. graphs) to demonstrate the outcomes and benefits of the project for the public, and for administration. The data should also be presented at the site in the form of interpretive signage.

The information gathered from the biomonitoring of the Pollinator Park can be used for education at many levels. It can serve to push for a new consciousness towards conservation ethics, and to identify the new audiences. Citizen scientists are extremely useful for continued monitoring on a broader scale. Also, the data can be used to support the idea of tax incentives or breaks for being pollinator-friendly.

The biomonitoring will produce a record of the know-how developed by the Pollinator Park. This knowledge will transfer to people's personal gardens and, ultimately, to agriculture.

Closing Remarks of Day 1

After dinner, the overall results of the group meetings were once again presented to the conference participants by Ms. Victoria MacPhail. Dr. Gordon Frankie from the University of California at Berkley then closed the day's proceedings with an overview of urban pollination in California.



The workshop groups presented their work to one another.

Day 2

The second day of the conference, officially a meeting of the Canadian Pollinator Protection Initiative, continued the discussion of pollinator-friendly venues within the community. Dr. Bonnie Harper-Lore of the US Highway Federal Administration spoke about the rehabilitation of roadsides to allow for pollinators. Dr. Eric Lyons addressed the amelioration of golf courses to serve as pollinator friendly habitats. Dr. Laurence Packer discussed bee diversity, and the use of Green Architecture in the urban setting. Ms. Lorraine Johnson spoke about gardens and pollination. Mr. Doug McRory, Ontario's Provincial Apiarist, discussed beekeeping in the urban setting.

Once again, the afternoon entailed break-out groups that discussed five themes, this time centered around what improvements can be made on a local and national scale. Their primary recommendations are summarized below.

Group 1: ROW (Rights of Way)

Group 1 expanded on Dr. Bonnie Harper-Lore's talk on the use of right-of-way passages as pollinator habitats with a discussion about employing this technique in Canada. Although many right-of-way passages are used to protect wildflowers or pollinators in the States, this is not done in Canada. Dr. Harper-Lore explained that right-of-way passages, including highways, power lines, gas lines and other maintained corridors can be designed in such a way that they serve as pollinator habitats. This type of maintenance can actually be performed in a less-costly manner than conventional upkeep, while providing environmental sanctuaries.

Although the inception of a program using right-of-way passages as environmental sanctuaries may seem like a monumental task, Dr. Harper-Lore had many examples of the use of these programs throughout the US. Some people argue that differences in the Canadian climate, roadways and laws might reduce the efficacy of this system. To ensure that this is not the case, use of right-of-way passages should begin at a small scale, and with some research, may be built to a national endeavour. Experimental and demonstration plots can be developed to show exactly what works, with regional test plots to determine what plants work. Native plants for each region need to be defined, and seed sources must be acquired. Research should also include the development of standards for roadsides, their rehabilitation and planting. It should determine the requirements in terms of maintenance and the effects of snow control. This research, ideally, could be used to create a manual that would present the easiest and most efficient means of turning Canadian rights-of-way into ecological conservatories.

However, none of this – research or application – will be possible without governmental support. Without support of the government, it would be almost impossible to gain permission to use these lands differently than they have been used in the past. If governing bodies can be convinced to support at least a small-scale research effort, the results should indicate the superiority of the use of right-of-way passages in both ecological and financial terms. Starting at the local scale with city governments,

roadside mowing can be limited. Support, and ultimately leadership, from the government will assist in setting targets, such as dates by which tasks should be accomplished. A project of this size will ultimately need dedicated government funding and employees responsible for roadside naturalization, who can work with the grassroots community, local growers and seed producers, as done in Iowa. Working with both government and the individuals at a local level allows implementation of an approach that is simultaneously bottom up and top down.

Government support of the proposed intensity obviously needs to be supported to the public. Therefore, it is essential that the public be educated so that their opinion can take into account what is best for nature and the environment. In the dairy industry, there are dairy educators in each county who keep people informed about proper dairy processing. It was suggested that a similar stance towards education on the use of rights-of-way for pollinator protection, or even general ecological conservation, could be extremely beneficial. People need to be aware that native roadside planting will be beneficial, rather than damaging to the livelihoods of farmers.

Members of the community can also be used for innovation. They can suggest what can be planted for visual appeal, and what can be planted that might be perceived as useful. While roadsides might not be safe for growing "useful" plants such as blueberries, the rights-of-way for power lines and gas lines could be safely used for these plants. Ontario Power Generation (OPG) could be involved in a project to increase biodiversity along power lines, and gas companies could do the same. Tourism can also be brought on board, as the increase in aesthetic that will result from using flowers, rather than turf, along roadsides may attract more drivers to these than other highways. Surveys in the US have shown that transportation contractors appreciate the beautification of the highways, as it breaks up the often monotonous roadsides. There is also a possibility that the plantings can be tied back to carbon dioxide (CO_2) sequestration, as these plants should have a greater biomass, and thus should sequester more CO_2

than the short grasses they will replace. These plants should also ultimately require less maintenance, and thus should be less costly.

Group 2: Industrial Sites

Group 2 outlined the role of industrial sites as pollinator habitats. Industrial sites make up a large portion of land use. Traditionally, these areas tend to host massive buildings, but also include large areas that are not used and are generally minimally maintained. Ongoing research in the Tri-City area suggests that many local industrial sites are currently more pollinator-friendly that residential gardens.

This interesting information suggests that research needs to be done to figure out exactly why these sites are so inviting to pollinators, and to address some related questions. How much "better" are the industrial areas than residential areas? Do these site offer particularly good nesting sites, and if so, what kind? Are there more so-called "weeds" in these areas than residential areas? Have these sites simply been left undisturbed for extended time periods and therefore developed a higher level of natural succession? What kind of start-up occurred on these sites? Inventories of, and correlations between, the pollinators and plants in these areas must be made.

Both preliminary observations and subsequent research can be applied to city planning. The research should suggest ways in which to replicate the pollinator-friendly ecosystems currently found on industrial sites. These processes can be replicated both on the public scale in right-of-way passages (see above) and in public green spaces (see below), and on the private scale, in residential gardens. Tax breaks or certifications could be used as incentives to encourage those sites that are not pollinator-friendly to improve their properties.

The fact that industrial sites are privately owned means that, in terms of protecting the pollinator habitat and preventing disturbances, these sites are probably quite safe. However, these sites are often quite out of the way and because of the low traffic, can be dangerous to researchers who work alone.

Group 3: Urban Green Spaces

Group 3 discussed the importance of green spaces in pollinator conservation in the urban setting. Green spaces to other city zones were compared, and suggestions were made of ways by which to encourage public appreciation of pollinator-friendly green spaces. Improvement to the pollinator habitats in green spaces was also discussed.

Green spaces and industrial sites were considered separately for the purposes of brainstorming, but both groups recognized the importance of conferring between different groups and stated that all zones (especially green spaces, industrial zones and agricultural areas) should be careful to consider the same factors. To assist with this problem, there was a suggestion of multidisciplinary city planning, like an urban-forest department. Both groups agreed that urban bylaws that protect ecosystems, especially within urban green spaces, are generally lacking. Group 3 suggested that green spaces are, however, a somewhat more delicate subject because, unlike industrial sites, they are public areas.

There are many pre-existing conflicts with green spaces and hydroelectric companies, municipal initiations, tree-cutting and misconceptions held by the public. People need to be educated about bees and about how wildflowers are not necessarily weeds so that they will not be displeased by the presence of these elements in green spaces. To eliminate this lack of education, certain questions need to be addressed, starting with why people are so afraid of things that are “wild.” Awareness of the value of pollinators and supporting their habitat is also essential in order to promote the use of green roofs for pollination in all city zones. Group 3 suggested, similarly to Group 2, that these changes are most

important while planning for new sites, but can also be retroactively applied to currently-maintained green spaces.

To ensure that Guelph's green spaces are as friendly as possible to pollinators, a percentage of each park could be designated to pollinator-friendly trees and shrubs. Planning of these plantings can occur in collaboration with Guelph Urban Forest Friends (GUFF), The Appleseed Collective, Laughing Toad Tree Nursery and other such groups. Another percentage should also be designated to "naturalized" areas to allow for pollinator habitats. The city also needs to establish the definition of a "naturalized" area to ensure that this term is not manipulated. Terms like "marginal lands" need to be eliminated, as many of these lands can be naturalized and used for ecosystem restoration, including pollinator conservation. Trails through green spaces can be used to exemplify the improvements made in to increase biodiversity in the green spaces.

Group 4: Research

Group 4 discussed the current state of research on pollinators and pollinator conservation. It was agreed that, relatively speaking, pollinators have not been studied in great depth. Only a small percentage of the many known pollinator species have been closely studied. Approximately ninety percent of pollinator species have unknown biologies and ecologies. Greater understanding of the lifecycles and ecologies of pollinators will allow the development of a more sophisticated plan for their protection. Their population dynamics, especially at the community and landscape levels need to be investigated. The sampling methods used to illuminate bee biology should be refined. Many techniques are currently in use, but it is important to standardize the methodologies. Pan traps can be used to establish baseline data in both urban and rural areas. Artificial nesting areas can be used for both sampling and other studies, such as those examining the interactions between pollinators and the plants they pollinate.

Collaborative research at the bioregional level is also important. This will allow investigation of serious topics such as the drastic decline bumble bee populations around the world, and the influence of pesticides on pollinators. The example of the ALARM (Assessing Large-scale Risks for biodiversity with tested Methods) project in Europe could be followed for guidelines of how to collaborate at a large scale.

Less pressing research into the relationship between honey bee and native bee foraging was also discussed. Specifically, the group suggested looking at the effects that foraging of honey bees has on native bees. They also discussed training bees for floral consistency to increase seed set for agricultural production. Longer-term studies into bee dispersal relative to landscape ecology were also mentioned. These studies could include micro-satellite studies and investigations of both population size and gene flow.

It is interesting to note that, in the midst of an unprecedented pollinator decline, there are fewer entomologists than in the past. The group proposed that there has been a decrease in funding for systematics and taxonomy work, such that the number of people paid to do this research has decreased, with only slight improvements in the very recent past. There should be more training for identification of pollinators, as it is very difficult to closely observe pollinator declines without being able to identify the species.

Even though trained entomologists are becoming scarce, interested members of the public are still around. Citizen science is one aspect of pollinator research that has been growing lately. Canada's Environmental Monitoring and Assessment Network (EMAN) has set up a program called "Pollinator Watch" which allows citizen scientists to evaluate the pollinator presence in their area. It would be very

useful to determine the accuracy and precision achieved by citizen science to ascertain what scientific value this information has.

It would also be very interesting to so some social studies concerning the psychology behind the great fear of bees that haunts a large part of the population. Although some bees do sting, a high percentage that do not, and it would be interesting to discover what social factors have caused these fears. This would help promote a change in the attitude of the general public toward bees. It would be worthwhile to do some research on public education, specifically on marketing tactics for positive associations with pollinators.

Group 5: Progress from Guelph & Beyond

Group 5 addressed the implications of Guelph's Pollinator Park on a more global scale. They suggested the premise of "act locally, think globally". Guelph can be an example of a city with an interest in pollinators, and of the revolutionary things that can be done locally. By re-establishing and sustaining pollinator populations in Guelph, the community can develop a system that can be applied to the province and beyond. By extending the lessons learned in Guelph to the rest of the world, both local and global pollinator protection can be achieved, with Guelph as somewhat of a catalyst for the movement.

In order to facilitate this movement, Guelph should establish a template of what is being done, starting with the habitat being set aside and a design being pre-qualified. Budgets can then be created, and priorities and conditions can be set. It is important that science informs the design and sets the example of what can be done. The purpose of Guelph's Pollinator Park will be to increase diversity, a goal that can also be applied at the global scale. Science predicts that generalist pollinators will be the first to move into the habitat, then specialists. Cuckoo bees and parasitic wasps will follow. The diversity

established in the park must be sustainable. In parks, the focus is often on flora, but the Pollinator Park presents the opportunity to enjoy the fauna as well. Both flora and fauna should be monitored and documented carefully. Documentation of both the biology and the creation process of the park are essential for re-creation in other locations, and to establish permanency.

Once the Pollinator Park is established, it is important that a management system be in place to ensure continuity of the park and its mandate. The park could provide an example of pesticide-free gardening, and also an example of how to reclaim land that has been devastated. The flora that grows in the park could be used to develop a seed stock that could be used by other nearby communities that wish to follow Guelph's example. Also, promotion of wildflowers and education regarding the difference between wildflowers and weeds may provide impetus to change noxious weed laws.

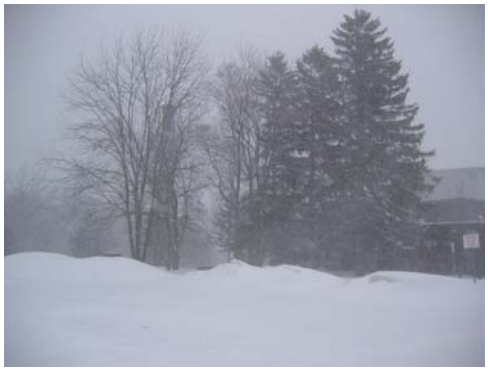
To provide feedback to the community, and to make this a useful tool in promoting the creation of other pollinator parks, there must be some form of interpretive program that provides the public with information about the pollinators and their protection. An on-site interpreter could provide signage for trails as well as public education. Education is essential to promote knowledge and understanding of pollinator ecosystems. Topics such as the "web of life" and the importance of environmental protection can be provided in addition to pollinator propaganda and information on trees and flowers. In this way, the information can teach a fundamental humanity, making it less about the individual or the economy, and more about sustaining all forms of life. This type of nature interpretation could be used to promote pollinator tourism as a new form of ecotourism and can provide an opportunity to reconnect with nature.

Informing the public not only gives back to the community, but also increases the likelihood of other communities following the example of the Guelph Pollinator Park. By connecting with school liaisons,

nature interpreters can establish school programs that can bring children to the park, and educate them at a young age. Volunteers can also participate in education at both park and community levels. Finally, the group came up with an alliteration to describe the greater goal that should arise from the pollinator park: "People doing positive progressive things to promote and preserve places to permanently protect pollinators in perpetuity on the planet."

Conclusions

The Pollinator Workshops had a great turnout, and the discussion groups were highly productive. Certain themes were highly recurrent within the groups. The most recurrent theme was public education. This education should answer basic questions including why and how to protect pollinators, and should target as wide of a range of interest groups as possible. Pollinator Park provides the opportunity to let the public know that protecting pollinators is fun and easy. The park must be carefully planned to ensure its longevity and to allow other sites to replicate the basic design. Biomonitoring and further research on pollinators are both required to prove that the park is achieving it purpose. The principles applied in the Pollinator Park can also be applied to many other aspects of city planning, including zone bylaws and right-of-way passage maintenance. Overall, the Pollinator Park should be a wonderful learning tool for not only the City of Guelph, but also the world at large.



Conference participants had to fight their way home through a bitter storm.

Photos courtesy of Victoria MacPhail and Marianna Horn

Appendix 1: Guest Speakers and Other Key Contacts

Councilor Vicki Beard
207 Speedvale Ave East
Guelph, ON, N1E 1M6
vicki.beard@guelph.ca

Dr. Karen Landman
School of Environmental Design & Rural Development
University of Guelph
Guelph, ON, N1G 2W1
Canada
klandman@uoguelph.ca

Dr. Gordon Frankie
Division of Insect Biology
137 Mulford Hall
University of California
Berkeley, CA 94720
USA
frankie@nature.berkeley.edu

Dr. Eric Lyons
Department of Plant Agriculture
University of Guelph
Guelph, ON, N1G 2W1
Canada
elyons@uoguelph.ca

Dr. Steven Handel
Department of Ecology, Evolution, & Natural Resources
Rutgers University
1 College Farm Road
New Brunswick, NJ 08901-1582
USA
handel@AESOP.Rutgers.edu

Dr. Edward McBean
Department of Engineering
University of Guelph
Guelph, ON, N1G 2W1
Canada
emcbean@uoguelph.ca

Dr. Bonnie Harper-Lore
US Department of Transportation
380 Jackson Street, Ste. 500,
St. Paul, MN, 55101
USA
Bonnie.Harper-Lore@fhwa.dot.gov

Mr. Doug McRory
OMAFRA, 1 Stone Rd W
Guelph, ON, N1G 4Y2
Canada
doug.mcrory@ontario.ca

Ms. Victoria McPhail
vmacphail@gmail.com

Ms. Marianna Horn
Department of Environmental Biology
University of Guelph
Guelph, ON, N1G 2W1
Canada
mhorn@uoguelph.ca

Dr. Laurence Packer
Rm 209A Lumbers Building
York University
4700 Keele Street
Toronto, ON, M3J 1P3
Canada
laurencepacker@yahoo.com

Ms. Lorraine Johnson
61 Palmerston Square
Toronto, ON M6G 2S8
Canada
ljohnson@interlog.com

Dr. Vernon Thomas
Department of Environmental Biology
University of Guelph
Guelph, ON, N1G 2W1,
Canada
vthomas@uoguelph.ca

Dr. Peter G. Kevan
Department of Environmental Biology
University of Guelph
Guelph, ON, N1G 2W1
Canada
pkevan@uoguelph.ca

Dr. Julianna Tuell
Department of Entomology
Michigan State University
202 Center for Integrated Plant Systems
East Lansing, MI 48824, USA
tuelljul@msu.edu