

SITE D - TECHNICAL STUDY, BIOPHYSICAL ANALYSIS REPORT

SUMMARY OF BIOPHYSICAL IMPACTS

Quotes from the report:

"Site D poses minor biological constraints to the establishment of a landfill site... Approximately 4.5 ha [(46%)] of natural vegetation would be eliminated to accommodate a landfill operation, comprising all of the small woodlot (2.5 ha) [D2] and approximately 2 ha of the northwest portion of the larger woodlot [D1]... The plant communities found on Site D are common communities typical to the area and contain mostly species which are common and typical for the Halton Region." (p. 119)

"Because approximately 2/3 of D1 will remain intact, loss of plant and wildlife habitat will be minimal." (p. 122)

"No provincially rare species...the report of Crataegus corusca (hawthorn) is not likely. Various levels of regional significance can be attached to an additional 41 native species, as follows: 2 regionally rare species (Potamogeton natans (common floating pondweed), Sanicula gregaria (black snakeroot)), 6 regionally scarce species and 33 regionally occasional species.... The proposed location of the landfill will result in...the loss of all known representatives on the site of 1 regionally rare plant (black snakeroot), 3 regionally scarce [50%] and 9 regionally occasional species [27%]." (p. iii)

"The mammal, bird, reptile and amphibian species found on the site are common to the area." (p. 121)

MODIFICATIONS TO THE LANDFILL

1. Shift the landfill boundaries

The potential impacts of the landfill could be minimized further by slightly modifying the boundaries of the landfill operation, to skirt around woodlots D1 and D2. To make up for these last areas the boundaries could be shifted slightly to the north and west (see Figure 1, p. 65). This modification would protect all of D1, saving an additional 2 hectares of natural area.

2. Modify the drainage alterations along the western boundary of the site plan.

The report proposes to alter the drainage system that enters the site in the northwest and exits the site through woodlot D2. It would be rerouted through the buffer area that parallels the First Line. This would result in the loss of

most of woodlot D2 for the following reasons: (a) the drainage channel will remove some of the vegetation, and (b) it will alter moisture regimes with some of the woodlot drier or wetter than presently.

To safeguard woodlot D2, consideration should be given to rerouting the drainage system further west to the roadside edge of the First Line, thereby avoiding most of the woodlot. Alternatively, the existing entry point of the ditch into the woodlot D2 could be retained; however, the drainage channel to the north would be shifted west to the buffer zone along the First Line. The latter alternative would ensure the retention of woodlot D2 in its present state. Moisture regimes would not be modified and vegetation would not be lost to make way for a new drainage channel.

3. The storage of top soil should be kept away from the woodlot.
4. Summary:

These changes would safeguard the woodlots and protect all the regionally significant species. As a result the landfill would have no net environmental effects, other than a continued vermin problem (see Table 5, p. 127). Currently there is a low impact due to the loss of some regionally significant species.

SITE F - VEGETATION Section 3.2

GOOD POINTS

- Good species list, good mapping of the plant communities and a detailed description of the community types.

SHORTCOMINGS

1. The locations of most rare species are unknown

- Most of the significant plant species are not mapped.
- Locations are known for only 26 (23%) of the 113 regionally significant species

20 regionally rare species - 14 mapped (70%)
 29 regionally scarce species - 9 mapped (31%)
 64 regionally occasional species - 3 mapped (5%)

prov. uncommon
 but common in region

iii says
 116
 are you
 excluding
 prov.
 rare
 ones
 here?

* 27/116 then

27/116

*

2. No listing of nationally rare species

The report fails to note in the summary sections that the 3 confirmed, provincially rare plant species (Sphenopholis nitida (nodding wedge-grass), Frasera caroliniensis (American Columbo), and Carex gracilescens (a sedge)) are also nationally rare. Within Canada, these species are restricted to the extreme southwestern portion of Ontario.

3. No listing of Carolinian species

explain - why now important.

* ① most biodiversity community

The report fails to list the Carolinian species (see Table 1). Site F contains 12 Carolinian species that are largely or entirely confined to the Deciduous Forest Region (Carolinian Zone). This relatively large number of Carolinian species emphasizes the southern aspect of Site F and its regional significance. There are few other areas in the Halton Region that support such a high concentration of Carolinian species. In contrast, Site D only supports 2 Carolinian species (see Table 1).

② 68% of all of Ont. rare plant life (rare areas)

③ less than 10% remaining consid. one of most end. habitat

4. No mention of the national significance of Carolinian forests

Site F contains good examples of Carolinian forest. The report fails to note that the Deciduous Forest Region (Carolinian Zone) is one of the most endangered habitats in Canada. From a national point of view the zone is unique, although it makes up less than a quarter of one percent of Canada it boasts more nationally rare species of flora and fauna than any other region in Canada. Most of Canada's Carolinian forests have been destroyed over the years to make way for agricultural or urban development. Less than 10% of

went there
 not.

Q

the Carolinian Zone is now covered in forests; in some counties such as Essex and Kent the percentage of forested lands have dropped below 3%.

5. Poor assessment of the regional/provincial status of plant communities

Contradiction

The report makes contradictory statements on the regional/provincial significance of the plant communities at Site F. In the "Executive Summary" (p. ii), the report states, "the vegetation is composed of 21 different vegetation habitat types...none of which are uncommon or unusual in Halton." In the "Summary of net environmental effects," however, the report notes that Site F contains, "uncommon vegetation community types." On p. 159 it states that landfill on Site F will result in the "loss of a wide range of vegetation habitat types not well represented elsewhere and indicative of Carolinian conditions and including oak-hickory." An earlier report by Proctor and Redfern (1982), also states that the oak-hickory forest of Site F with its Carolinian associates is considered to be rare in Ontario. Moreover, *conserv. auth.* the Halton Region Conservation Authority believes Site F fulfills their ESA Criterion 4: "the area is an unusual habitat with limited representation in the municipality, Ontario or Canada, or a small remnant of a particular habitat which has virtually disappeared within the municipality."

6. Fail to note that Site F supports Niagara Escarpment vegetation

The report incorrectly states that Site F is entirely within the "Iroquois Plain Physiographic Region" (p. 13). In fact, this unit is confined to the southeastern corner, most of Site F occurs in the Niagara Escarpment Physiographic Region (Chapman & Putnam, 1984).

As part of the Niagara Escarpment, Site F should have been included within the Niagara Escarpment Planning Area. For some reason, probably political, a 15 kilometre section of the escarpment between Rock Chapel and Mt. Nemo was excluded from the planning area. If this part of the escarpment had been included, most of Site F would have been designated Escarpment Protection Area. Within such a designation a landfill operation would not be permitted.

SITE F - WILDLIFE, SECTION 3.3

RARE SPECIES

The report concludes in the summary of net environmental effects (p. 160) that the landfill operations will have a nil impact on wildlife species, because no rare or threatened species are located on Site F. The faunal information, however, is so cursory that such a conclusion is not justified.

The report did not carry out a detailed bird survey during the breeding period. Moreover, no trapping of small mammals was undertaken, a necessity for obtaining a complete mammal list. Because of the cursory nature of the faunal inventory rare fauna could easily have been missed. For instance, southern species like the Pine Vole (Microtus pinetorum) may be present (recorded once for the Halton Region). In addition, southern bird species like the Yellow-breasted Chat may be breeding on the site -- it has been recorded as a probable breeder within the 10-square kilometre grid (Ontario Breeding Bird Atlas) for the area (see Appendix D, p. 189).

WILDLIFE CORRIDORS

The report assigns only a low impact to the disruption of wildlife corridors. On p. 153, it states, "there is no natural wildlife movement corridor to the south of the site, and east-west movement will be maintained because of the presence of Sassafras Woods and the block of land that is not proposed for landfilling."

In fact, east-west movements have already been disrupted by the Regional Landfill to the east of Sassafras Wood. The landfill operation for Site F will further disrupt this movement.

At the present time there is a potential for north to east movement between the Niagara Escarpment natural areas, the northeast arm of Sassafras Woods and Site F. This movement will also be disrupted by the landfill operation.

In conclusion, the landfill operation should be assigned at least a moderate impact in regards to its effect on wildlife corridors.

SITE F - EFFECT OF LANDFILLING OPERATION ON BIOPHYSICAL
RESOURCES - SECTION 4

The report downplays the impact of Option 3 on the biophysical resources of Site F. In the "Summary of conclusions" (p. 152) the report states:

"The mitigation measures of adopting the Option 3 design for landfilling significantly reduces the adverse impact of a landfill on the biological resources of the site and environs. Representative units of all important habitat types will be retained and a substantial number of representatives of significant species also will be preserved."

In contrast, the section on the "Effect of Landfill Operations on Biophysical Resources" is more critical of Option 3, stating that:

"Major losses of vegetation communities and significant species would occur under Option 3" (p. 116).

THE MAJOR IMPACTS OF OPTION 3

1. SIGNIFICANT SPECIES

In regards to the significant species, Option 3 will have the following impacts:

- A. Nationally/provincially rare species (3 species) -- all the species confirmed for Site F will be eliminated.
- B. Regionally rare species (20 species) -- locations are known for 15 species, of these 73% (11 species) will be eliminated and another 13% (2 species) will be reduced in number. One of these 2 species, Fragrant Sumac, will suffer a decline of 83% (15 of its 18 localities will be eliminated) (based on a map of significant native flora). The loss of regionally rare species is even more dramatic when one examines the number of regionally rare localities or stations affected by Option 3. Out of the total of 70 localities plotted on the map of significant native flora, 74% (52 localities) will be eliminated. Another 10% (7 localities) are within 50 metres of the landfill boundary. The resulting changes in drainage and the increased dust levels brought on by the landfill may also eliminate these populations.
- C. Regionally scarce species (29 species) -- locations are known for 9 species, of these 22% (2 species) will be eliminated and another 57% (5 species) will be reduced in numbers.

10/14
on table
5 p. 113.
rewritten
on table

- D. Carolinian species (12 species) -- locations are known for 9 species, of these 67% (6 species) will be wiped out by the development, including the provincially rare Carolinian species and all the regionally rare ones.

2. PLANT COMMUNITY TYPES

Three natural communities will be wiped out by Option 3 (shrub thicket (S1, S6) and wetland (W3)). In addition, another 3 communities will be reduced to small remnants (10% or less of their former area). They include the two forest communities (F3, F4) and the shrub thicket community (S3).

The most significant plant community on Site F, the oak-hickory forests (F1 and F2), will be reduced by 50%. this forest sustains the highest concentration of plant rarities and Carolinian species on Site F. Unfortunately, Option 3 will destroy the most significant portion of the oak-hickory forest community type. All the provincially rare, and 75% of the regionally rare species are restricted to the (50%) of the oak-hickory forests which will be wiped out by Option 3.

HABITAT DIVERSITY

The report clearly states that Option 3 will eliminate the portion of Site F with the greatest habitat diversity.

"Within the boundary of Option 3 there are more examples of the [habitat] types and the units of the types tend to be larger. Thus the area with the greater habitat diversity will be eliminated" (p. 110).

As the report notes, the area to be landfilled under Option 3 supports a good representation of all the plant community types on Site F, with the exception of a pine plantation -- an artificial community anyway.

4. TOPOGRAPHIC DIVERSITY

The report notes that Option 3 will destroy the portion of Site F with a "more diverse terrain of valley and ridge formation" (p. 116). This pronounced escarpment valley and ridge formation is considered uncommon in Ontario (Proctor and Redfern, 1982). Moreover, Bird & Hale (1985) believe that Site F with its erosional features of ridges and ravines which exposes the Queenston shale parent material, may be a distinctive and unusual landform (p. 17).

Finally, a number of rare plants are restricted to the valley crests, which are most pronounced in the Option 3 area. For instance, 5 regionally rare species (Rubus flagellaris,

eyeball
they didn't
call.
to remove
after
option 3
community
figure out

oak hickory -

conserv.
auth.
letter.
ESA

Desmodium rudiflorum, Ranunculus hispidus var. hispidus, Solidago squarrosa and Anemonella thalictroides) are restricted at Site F to valley crests within Option 3.

CONCLUSION

In conclusion Option 3 will have the following impacts:

1. The highest quality example of oak-hickory forest (a rare Carolinian vegetation type) will be destroyed.
2. All the provincially/nationally rare and most of the regionally rare plant species will be wiped out, the remainder will be reduced in numbers.
3. Three natural plant communities will be wiped out and a further 3 plant communities will be reduced to small remnants.
4. Most of the valley and ridge formation (an uncommon landform feature) will be destroyed.
5. The area of greatest habitat diversity will be destroyed.

SITE F - MITIGATION MEASURES (SECTION 5)

1. LONG TERM REHABILITATION - allowing vegetation in adjacent areas to perpetuate and move onto the landfill area

In terms of long-term rehabilitation the report makes the following statements:

"As a result of the landfilling, the surface elevation will be raised, the valley and ridge complex will be eliminated, and the final topography will be gently rolling with an overall slope to the southeast...surface soils will be a combination of imported and stored minerals and topsoils." (p. 107)

"The potential for natural colonization and succession of...the landfilled area, by the remaining vegetation in the unutilized area of either Option 2 or 3, would be important in reducing the significance and longevity of the impact of the use of Site F as a landfill." (p. 115)

For the report to expect vegetation communities on top of the landfill to resemble the original vegetation on the site is ludicrous. The formerly dissected valley and ridge topography will be replaced by a gradually sloping plain. Drainage, soil and other substrata features will have been drastically altered. Many of the species currently on the site, especially the rare ones, will not be able to colonize the landfill.

2. REPLANTING (TRANSPLANTING)

In regards to transplanting, the report makes the following statements:

"Although the communities on the landfill site cannot be saved there are measures that can be taken to save individual species. The measures include removal of the species from the habitat being eliminated and transplanting them in similar, if not identical habitats in another area, and the collecting of seeds of such species and the dispersal of these seeds in similar habitat." (p. 121)

"Through site observation, it has been determined that the portion of Site F that would not be used for landfilling contains habitat similar to that which will be lost through the landfill activities. Species from the eliminated habitats could be transplanted." (p. 121)

The transplant proposal is not based on sound ecological knowledge. There is little ecological information on the rare species proposed for transplanting. Detailed habitat requirements and life cycles must be known if the program is to have any chance of success. To obtain such knowledge is both time consuming and expensive. 51

The report claims that the "portion of Site F that would not be used for landfilling contains habitat similar to that which will be lost through the landfill activities." A similar habitat, however, may not be similar enough for species with very specific habitat requirements.

For instance, Option 3 will retain 50% of the oak-hickory forest, however, all the provincially rare and most of the regionally rare species in this community are confined to the 50% which will be destroyed. This suggests that the remaining oak-hickory forests lack the specific microhabitats (e.g., valley crests) required by these rare species.

GENERAL COMMENTS

- Should get the Halton Region Conservation Authority to explain their Environmentally Sensitive Area designation and how Site F fulfills the criteria for an ESA.
- Should get Halton Regional planners on the stand -- ESAs are in the Halton's Official Plan.
- The Canadian Botanical Association is preparing a position paper on transplanting. The association is strongly opposed to using transplanting as a mitigation measure.
- Need to determine the status of agricultural land at Site D. What class is the farmland? Is it regionally significant farmland?
- Need to obtain copies of the following reports:
 - Proctor and Redfern, 1982
 - ✓ Dillon, 1984
 - Official Plan for Halton ✓
- Should consider carrying out our own comparative evaluation of Site D and Site F. The current one is extremely biased and subjective.

Table 1: List of Carolinian plant species occurring at Site F and Site D. Species for which locations are known are denoted by the symbol "*". Those which will be eliminated by the landfill operation are denoted by the symbol "E".

SITE F

SITE D

A. Species restricted to Canada's Southern Deciduous Forest Region (Carolinian Zone).

1. *Frasera caroliniensis* - *,E
(American Columbo)
2. *Carex gracilescens* - *,E
(a sedge)
3. *Sphenopholis nitida* - *,E
(Nodding Wedge-grass)
4. *Juglans nigra* - *
(Black Walnut)
5. *Vitis aestivalis* - *,E
(Summer Grape)

B. Species largely confined to Canada's Southern Deciduous Forest Region, with a maximum of 5 stations elsewhere in southern Ontario.

Outliers in eastern Ontario

6. *Vaccinium pallidum* - *
(Dryland Blueberry)
7. *Quercus velutina*
(Black Oak)
8. *Rosa carolina* - *
(Carolina Rose)
9. *Anemonella thalictroides* - *,E
(Rue-anemone)
10. *Desmodium cuspidatum*
(a tick-trefoil)

1. *Carex laxiculmis* - *,E
(a sedge)

Outliers to the north

11. *Euonymus obovatus*
(Running Strawberry Bush)
12. *Ranunculus hispidus* var.
hispidus - *,E
(Bristly Buttercup)

2. *Euonymus obovatus*
(Running Strawberry Bush)

Table 2: List of plant communities at Site F and their associated provincially/nationally and regionally rare plant species. Species for which actual locations are known are denoted by the symbol "*", those which will be eliminated by the landfill operation are denoted by the symbol "E". This table is based on information in Bird and Hale (1986).

Forest Communities - F

F1

Nationally/provincially rare:

Frasera caroliniensis - *,E
(American columbo)

Carex gracilescens - *,E
(a sedge)

Regionally rare:

Anemonella thalictroides - *,E
(Rue-anemone)

Aster sagittifolius - *
(Arrow-leaved Aster)

Ranunculus hispidus var. *hispidus* - *,E
(Bristly buttercup)

Rhus aromatica - *
(Fragrant Sumac)

Rubus flagellaris - *,E
(Northern Dewberry)

Vitis aestivalis - *,E
(Summer grape)

Table 2 (continued)

F2

Nationally/provincially rare:

Fraseria caroliniensis - *,E
(American Columbo)Carex gracilescens - *,E
(a sedge)

Regionally rare:

Solidago Squarrosa - *,E
(Bristly Goldenrod)
Tick-trefoil)Desmodium Cuspidatum
(Pointed-leavedDesmodium nudiflorum - *,E
(Naked-flowered Tick-trefoil)

F3

Nationally/provincially rare:

Sphenopholis nitida - *,E
(Eastern Red Cedar)Rhus aromatica - *
(Fragrant Sumac)SHRUB THICKET COMMUNITIES - 5

S1

Nationally/provincially rare:

Fraseria caroliniensis - *,E
(American Columbo)

S2

Regionally rare:

Aster sagittifolius - *
(Arrow-leaved Aster)

S3

Regionally rare:

Juniperus virginiana - *,mE
(Eastern Red Cedar)Rhus aromatica - *
(Fragrant Sumac)MEADOW COMMUNITIES - M

M1

Regionally rare:

Aster sagittiflorus - *
(Arrow-leaved Aster)Virgulis Xamethystinus - *,E
(Amethyst Aster)

M2

Regionally rare:

Aster sagittifolius - *
(Arrow-leaved Aster)WETLAND MEADOW COMMUNITIES - W

W2

Regionally rare:

Cirsium muticum - *
(Swamp Thistle)