

**Flin Flon and Creighton**

# Green Project News

**Volume 3, Issue 1 March, 2003**

## Introduction

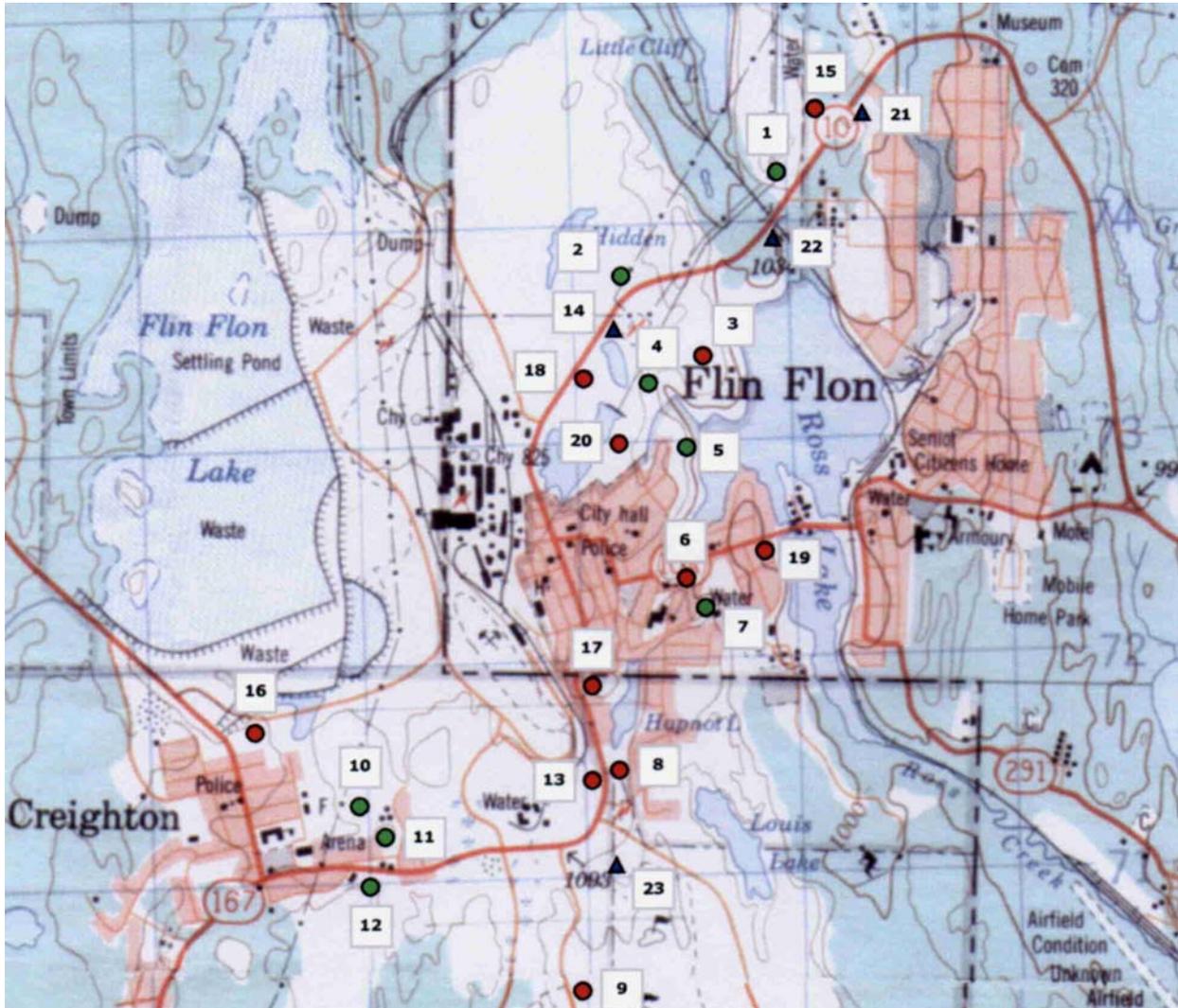
- We have successfully completed the third year of an initial five-year community-based plan.
- Our purpose is to accelerate the re-vegetation of barren areas in and around our communities by the application of crushed limestone (a method that has been demonstrated to be very effective in the Sudbury area).
- Because of the ruggedness of our terrain, it is not feasible to do the work by machine, so we use people-power, namely, students from local schools, and adult volunteers.
- The organizational and scientific background to our project are explained in Appendices 1 and 2 - below.

## Our Partners

We gratefully acknowledge that our project has been made possible through the generosity of our partners. Major funding for the work in 2002 came from Manitoba Conservation – Sustainable Development Innovation Fund, Manitoba Hydro – Forest Enhancement Program, Saskatchewan Environment – Shield EcoRegion, and Hudson Bay Mining and Smelting Company Limited. The City of Flin Flon and the Town of Creighton hauled the limestone to the areas to be treated. Flin Flon School Division (and its Youth Mentor Program) and Creighton School Division supplied the bulk of our workforce. Manitoba Industry Trade and Mines provided us with maps and air photographs, and Flin Flon and District Environment Council helped us with project administration. Home Hardware donated supplies.

## Areas Treated

During a field season lasting from May 16 through October 10, 121 yards of crushed (dolomitic) limestone was spread in eleven areas for a total of 3.89 hectares (9.6 acres). The total area covered during our first three years is 13.33 hectares (32.9 acres). The map shows the areas we have treated to date, and the areas we plan to treat in 2003 (circles indicate areas treated 2000-2002 – red fill indicates further work planned in 2003, triangles indicate new areas for 2003).



(1: Balsam, 2: Rock Cut, 3: Second Valley North, 4: Second Valley West, 5: First Avenue, 6: Hiawatha, 7: Grandview, 8: Hapnot, 9: Phantom, 10: Knight North, 11: Knight, 12: Pizza, 13: South Main, 14: Pond, 15: Esso, 16: Creighton North, 17: Super K, 18: Triple Seven, 19: Market, 20: Reservoir Hill, 21: Lancaster, 22: Railroad, 23: Phantom North).

## Personnel

The work in 2002 was carried out by 744 individuals during 40 sessions (638 students in 24 sessions, and 106 members of the general public in 16 sessions). Some of our workers are shown below. On the left are the Youth Mentors with coordinator Heather Acres at Hapnot Lake in May. On the right are McIsaac kindergartners at Second Valley in June.



## New Growth in Treated Areas

The areas we are treating are either totally barren, or have a few scattered tufts of the metal-tolerant grass *Agrostis capillaris*, and a few stunted 'relict' poplars, birches, and willows. Original organic topsoil is commonly entirely absent, or where present is thin. The ground surface is a combination of bare rock outcrop, and sandy or silty gravel with a variable content of pebbles and boulders. Areas treated in May and early June of each project year have generally shown some signs of life (typically Manitoba maple) within a month. By August, seedlings of birch, aspen, balsam poplar, and a variety of willows appear. Although the maples tend not to over-winter well, the others flourish, and in the second season grow to about half a metre. Birches in one of our areas treated in 2000 are now over a metre tall. A few scattered spruces tend to appear in the second year. Flowering plants such as Bicknell's geranium, fireweed, corydalis, etcetera are found here and there. Although the grass *Agrostis capillaris* is metal-tolerant, it does far better in treated than in untreated areas. While all areas treated to date have responded positively, the results in some areas are more spectacular than in others – this is one aspect of the project being looked into by our consultant. The picture below left shows birch and willow seedlings in our Hapnot area in September, 2002 - the area had been treated in June 2001. The picture on the

right shows pine seedlings in our Knight North area in September 2002. The area had been treated in October 2001, and the pine cones were scattered by Saskatchewan Environment personnel in February 2002.



### **Planting, Seeding, and Scarification**

Although we are depending primarily on the natural ‘seed rain’ to do the re-vegetating for us, we have done some small-scale experimental planting and seeding. The survival rate of spruce, pine, tamarack, and alder seedlings planted in ten plots in September 2001 (see ‘Green Project News’ for April 2002) is close to one hundred percent., with the alder doing particularly well. Most of the white ash seeds put in at the ‘plantations’ germinated, but the acorns (bur and red oak) did not. The dwarf birch seeds scattered alongside the creek at Second Valley seem not to have germinated. Poppy seeds scattered at our Phantom area by a member of the golf club in August 2001 germinated, and were in bloom in early July. Seeds from pine cones scattered at the Knight North area by Saskatchewan Environment personnel in February 2002 had started germinating by mid-July (see picture above). Results from the grass seeding at the Rock Cut area in September 2001 were disappointing. Although there was some germination by late June, very little of this growth survived – possibly because of the hot dry spell later on. Because of the success of last year’s poppy seeding, a mixture of garden and wild seeds (Iceland poppy, white ash, rose, lupin, forget-me-not, monk’s hood, lily, and aster) was scattered in small plots in the Phantom, Hapnot, and Second Valley areas in September.

It had been noted in 2001 that where the surface in some untreated areas had been disturbed - for example by being packed or churned by vehicles - grass growth was enhanced. In early October, as an experiment, and on the advice of our consultant, two-by-four metre plots close to our Balsam, Triple Seven, and Second Valley

locations were scarified using a ‘muck scoop’ (a kind of pointed draw hoe used by miners). Following scarification - to a depth of ten to fifteen centimeters - one half of each plot was treated with limestone, the other half was left untreated. Depending on results, more extensive scarification may be carried out in the future.

### Technical Support

Botanist Professor Keith Winterhalder from Sudbury spent five days here in August checking over our project areas. He made an inventory of plant types, and collected soil samples for analysis. We expect a technical report on his findings shortly. Copies of reports on his earlier visits (in 2000 and 2001) are available for inspection at Flin Flon Public Library.

### Photography

During our first two project years we took 335 pictures, and this year we have taken 192. These will serve as a permanent record of the project, and will be used for public relations purposes. Pairs of before-and-after pictures illustrate in a dramatic way how effective the limestone treatment is proving to be, for example, the picture at left shows limestone being applied in our Knight area in May 2000, the picture on the right shows the same view in July 2002.



### Public Relations

Articles in the daily ‘Reminder’ and the weekly ‘Gazette’ kept our project in the public’s eye in 2002. We also had coverage from our local radio station, and cable TV channel. An article on the project appeared in the spring 2002 issue of ‘Alternatives’ – a Canadian journal devoted to environmental issues, and another is scheduled to appear in Bearskin Airlines’ inflight magazine ‘Bear Country’ shortly. An article also

appears in the local visitors guide put out recently by Greenstone Community Futures Development Corporation. Informational signs on the project have been installed at the Knight, Hapnot, and Second Valley areas. We are planning to put a fourth sign at the Creighton Tourist Office in the spring. A PowerPoint slide show has been used as the basis of presentations to a number of local groups, and in September, we gave our first out of town presentation at Saskatchewan Environment's 'Integrated Resource Management' conference in La Ronge. A second issue of our newsletter - Green Project News - was produced in April, and copies were distributed to interested parties and deposited at Flin Flon Public Library. In mid-September, local residents were taken on a guided tour of some of our areas - they were very impressed with what they saw. Our web site is at [www.ffsd.mb.ca/greenproject/](http://www.ffsd.mb.ca/greenproject/).

### **Future Plans**

We aim to treat five hectares in each of the remaining two years of our initial five-year plan. In 2003, we plan to extend coverage in the 'Esso', 'Triple Seven', 'Second Valley', 'Hiawatha', 'South Main', 'Phantom', 'Pizza', and 'Creighton North' areas, and to start work in the new 'Pond', 'Lancaster', 'Railroad', and 'Phantom North' areas - see the map on page 2.

### **Additional Information**

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or check out our web site at: [www.ffsd.mb.ca/greenproject/](http://www.ffsd.mb.ca/greenproject/).

## **APPENDIX 1: Organizational background and procedures**

In the late 1960s and early '70s, botanists at Laurentian University – among them our technical consultant, Professor Keith Winterhalder – found that the application of crushed limestone to the barren acidified and metal-contaminated soils around Sudbury led to the regeneration of vegetation. A major program of limestone application since then has led to a transformation of the Sudbury landscape.

In the early 1990s, Rena Gummerson and later Cathy Hynes of the Creighton / Denare Beach Economic Development Committee contacted Professor Winterhalder to see if he might be interested in helping to set up a revegetation program in our area. This resulted in his first visit up here in 1994. In 1999, Heather Acres and Clarence Pettersen of Flin Flon School Division thought that revegetation would be a good project for their Youth Mentor Program. Hudson Bay Mining and Smelting Co., Limited and the Flin Flon Economic Development Commission provided funding to bring Professor Winterhalder up here in October 1999. He spoke to a number of groups and generated a high level of interest and enthusiasm. As a result, the decision was made to establish the Green Project. A committee was formed, and planning meetings were held in March and April 2000. Through the generosity of McKeen's Trucking, who donated 130 yards of crushed limestone, we were able to start work in May 2000. Since then, the Green Project has become an affiliate of the Flin Flon and District Environment Council.

Present members of the committee are: Flin Flon School Division – Youth Mentor Program, Creighton School Division, City of Flin Flon, Town of Creighton, Flin Flon and District Environment Council, Hudson Bay Mining and Smelting Co., Limited, Manitoba – Industry Trade and Mines, Manitoba Conservation, and Saskatchewan Environment.

The first stage in planning our field operations involves checking out maps and air photographs. From these we get a general idea of which areas might be suitable for treatment. We then walk over the ground, and once we decide on our areas, we mark out 50 x 50 metre squares. The crushed limestone is then trucked in and dumped as close as possible to the squares. We mark out the squares with rope. Our volunteers fill their pails at the dump, then spread the limestone in a strip between a pair of 'moving ropes'. As each strip is filled, we move the ropes and continue in this way until the whole square is covered

## **APPENDIX 2: Environment and Science**

In and around the communities of Flin Flon and Creighton<sup>1</sup>, there are large areas with little or no vegetation. Old tree stumps show that these areas were once forested.

In the 1920s and '30s when our communities and the smelter complex were first established, many trees were cut for fuel and lumber. Others were cut to make fire breaks, or were burned in forest fires. As production from the Flin Flon and other mines increased, so did the amount of sulphur dioxide smoke from the smelter. The smoke is harmful to vegetation so the forest was not able to recover. The increasing acidity and metal content of the soil meant that only a very few hardy types of plant were able to survive. As the plants died, the thin topsoil washed away.

High levels of metals such as copper and zinc in the soil are toxic to plants<sup>2</sup>. This toxicity is accentuated by acidity, which makes the metals more soluble, and therefore more accessible. When seeds germinate in metal-contaminated soil, growth stops immediately on contact with the toxic soil solutions. The carbonate ion in the limestone tends to neutralize soil acidity, thus making the metals less soluble, and less toxic. Another component of the limestone, calcium, contributes to reducing soil toxicity by competing with zinc ions for uptake by plant roots. Calcium ions also have a strengthening effect on the plasma membranes in the root cells. This membrane is responsible for determining what is absorbed by the roots.

Since the early 1970s, Hudson Bay Mining and Smelting Co., Limited has spent hundreds of millions of dollars to improve technology at the smelter complex, with the result that emissions of sulphur dioxide and metal oxide dust are now significantly reduced. The natural vegetation is slowly starting to recover. Our project will accelerate this recovery.

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<sup>1</sup> Flin Flon and Creighton are situated on either side of the Manitoba/Saskatchewan boundary about 600 kilometres north of the Canada/US border. A large copper-zinc ore body was discovered at Flin Flon in 1915, and production – which started in 1930 – continues to the present day.

<sup>2</sup> This paragraph is from information supplied by Professor Winterhalder.