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Executive Summary

The Working by Water Project was a project developed by Clean Annapolis River Project in the fall of 2002 to limit the sources of land-based pollution to the Annapolis River watershed. The project began in January of 2003, upon receipt of funding from Eco Action. The focus of the project was directed mainly at agricultural land uses adjacent to waterways, including pastureland and cropland located on river frontage, or through which tributaries to the Annapolis River run. A few non-agricultural sites where sedimentation due to erosion was occurring were also included in the project. Activities undertaken to achieve the project's goals focused mainly on establishment, enhancement and protection of riparian buffer zones, and on limiting livestock access to waterways.

Several methods were used to achieve these ends including: planting of red pines and shrub willows to establish and enhance riparian buffer zones, construction of live sills to stabilize eroding slopes and establish vegetated riparian buffer zones, installation of fencing along riparian buffer zones in order to restrict livestock from accessing the riparian zone and waterway, installation of livestock crossings on streams to prevent degradation and contamination caused by animals passing through the waterways, and installation of alternate watering systems to eliminate livestock's need to access waterways for drinking water. Another important component of the project was an agreement by Ducks Unlimited Canada to construct artificial wetlands on five farms as a means of regulating nutrients derived from farm waste, while creating quality wetland habitat for wildlife.

As a result of the implementation of the Working by Water project the following accomplishments were achieved:

- 124,625 square meters of riparian zone enhancement/restoration
- 9,700 trees planted
- 16,000 square meters of riparian zone protected
- 1600 meters of fencing installed
- 4 livestock crossings installed
- 2 gates installed on crossings
- 2 watering systems installed
- 23 live sills constructed
- 3 willow bundles buried
- 60 willow stakes used to stabilize eroding banks
- 100 willow stakes used in experimental plantings
- 5 wetlands constructed (43,000 m² of wetland constructed and 35,000 m² of riparian habitat)
- 7 stewardship agreements signed

Introduction

This report will summarise Clean Annapolis River Project's Working by Water project that was developed in the fall of 2002, and implemented in the spring of 2003. It will provide detail on the reasoning for the project and its development, its realisation, and the results obtained from its implementation.

Background

The Clean Annapolis River Project, founded in March of 1990, is a charitable organization whose goal is to *work with communities and organizations to foster the conservation, restoration and sustainable use of freshwater and marine ecosystems of the Annapolis watershed*. CARP's activities cover a wide range of environmental assessment, education and action projects. Some of the projects that CARP has initiated include volunteer air and water quality monitoring, private stewardship and conservation planning, and fish habitat restoration. CARP has been a participant in the Atlantic Coastal Action Program (ACAP) since 1991, and has been honoured with several regional and international awards for its efforts.

The Annapolis Valley is a largely agricultural area through which many streams and rivers flow, making their way from the bordering North and South Mountains to the Annapolis River on the Valley floor. Where waterways and agricultural land uses meet, there is potential for serious environmental degradation. There is a need in this area to refine agricultural land use practices in ways that will allow a sustainable co-existence between the Annapolis Valley's many farms and waterways. One effective and practical method of achieving this goal is to allow natural, vegetated buffer zones between the land and the water. These "green belts", called riparian buffer zones, are the natural transition areas between aquatic and terrestrial habitats, and perform several functions vital to the health of each habitat type. In addition, they are areas of high quality habitat for many types of wildlife such as reptiles and amphibians, aquatic and terrestrial mammals, insects and birds.

Clean Annapolis River Project developed the Working by Water project as an initiative to encourage better land use practices on agricultural lands bordering waterways in the Annapolis watershed. The project focused on limiting sources of land-based pollution, and enhancing, restoring and protecting riparian buffer zones on waterways bordering agricultural land use. This was to be accomplished by limiting livestock access to waterways and riparian buffers, and by establishing or enhancing vegetated riparian buffers where they were lacking.

Funding for Working by Water was obtained through EcoAction, an Environment Canada funding program for community based environmental initiatives. It is a program that requires that applicants provide a minimum of 50% of the total project cost in matching funds or in in-kind contributions. CARP sought to generate in-kind contributions to match EcoAction funding by requiring donations of labour and equipment from landowners, seeking donations of time and expertise from various parties having experience and knowledge that was valuable to the project, and by seeking a donation of trees for riparian zone reforestation from J.D. Irving Limited. Matching funds were generated primarily through salaries paid by Human Resources Development Canada (HRDC).

Methodology

The concept of the Working by Water project, as described above, was to limit sources of land-based contamination of waterways, and to establish, enhance and protect the riparian buffer zones of watercourses in the Annapolis watershed. The project was to focus primarily on agricultural lands, with an emphasis on limiting livestock access to waterways, and creating or enhancing riparian buffer zones between grazing lands and crop fields. Another consideration within the project's list of objectives was the reduction of streamside erosion by re-establishment of vegetation on eroded banks. The following is a list, and descriptions of the methods through which the project's goals were to be realised:

Live sills: The construction of live sills was to occur where steep, heavily eroding slopes were present. In order to conduct this activity, a Watercourse Alteration Permit for bank stabilisation had to be obtained from the Nova Scotia Department of Environment. The goal of live sill construction is to stabilize the slope, and to re-establish vegetation that will aid in future stabilization and effectively create a healthy, vegetated riparian buffer zone. The technique uses freshly cut willow stakes of a diameter between two and three inches, and of an approximate length of three feet. These are used to construct three to five foot wide "terraces" on the slope in a pattern intended to lessen the grade of the slope. The willow stakes establish root systems and grow sprouts, effectively establishing vegetation on the bank, and providing greater stability. The following is a sequential description of the construction of a live sill:

1. A shallow horizontal trench three to five feet in length is dug on the bank using a spade.
2. A row of stakes is pounded into the trench, perpendicular to the bank.
3. A row of vertical stakes is pounded into the trench between the horizontal stakes.
4. Stakes are placed along the face of the sill, making the structure "box like".
5. The soil that was removed from the bank when the trench was dug is replaced behind the face wall of stakes.
6. A row of stakes is pounded into the structure diagonally between the vertical stakes for added stability.

Fencing: Fencing was to be used to restrict livestock from accessing waterways and degrading riparian buffer zones. Distance from the watercourse, as well as fencing type was variable, and dependent on site characteristics.

Water crossings: Water crossings were to be installed where necessary as a complement to fencing, or on their own as a method of preventing livestock from passing through watercourses within pasturing areas. These were to consist of galvanized steel culverts placed in the watercourse, with a pathway constructed over them. Fencing would be used to direct livestock to the crossings, and gates would be used where divisions in pasturing areas were created.

Alternate watering systems: Alternate watering systems were to be used in situations where restricting livestock from a waterway would result in cutting them off from their only source of available drinking water. These were to consist of watering troughs connected to a source of clean water via a length of water hose, and fitted with a float valve to control water levels in the trough.

Riparian zone revegetation: Red pines and shrub willows were to be planted in riparian buffers to enhance their ability to perform such tasks as nutrient uptake, sediment filtration, bank stabilization, stream temperature regulation, and provision of wildlife habitat. In most cases, both species were to be used in conjunction, planted in parallel rows, with pines on the landward side, and willows closer to the water's edge. Trees within the rows were to be spaced on

average one meter apart. Where possible, furrows in which to plant the trees were to be ploughed in order to reduce competition from existing vegetation, allow for more water to infiltrate the soil, and to make the planting of trees easier.

After conceptualization of the Working by Water project had occurred, much planning was required to prepare the project for implementation. Sites suitable for the project's purposes had to be identified, and participation from the landowners confirmed. The first step taken toward accomplishing these goals was to develop a list of landowners, primarily farmers that owned land on which the goals of the project could be accomplished. This was done by observation of the area, and by speaking to individuals having a detailed knowledge of the area. Once a list had been compiled, landowners were contacted, and meetings were scheduled with them so that the concept of the project could be explained to them, and their participation in the project could be sought.

After confirmation that a landowner would participate in the project was received, the next step was to develop goals specific to each site, and to create a site plan that would accomplish these goals. This was done in cooperation with the landowners, who would be directly affected by the implementation of the site plan, and whose knowledge of their own land was invaluable to the planning process. Site plans were sketched on aerial photographs of each site, and these sketches were used to estimate the material requirements for site plan implementation. The costs of materials for all sites were estimated using a variety of sources to determine the average cost of required materials. The site information, landowners, site plans and material plots were included in a project plan and funding proposal that was submitted to EcoAction in October of 2002. Funding was confirmed in January of 2003, and the project was able to begin in earnest.

In order for EcoAction to release funding to CARP for Working by Water, site plans needed to be revised to fit the funding that was to be provided, and letters of participation had to be signed by all parties contributing in-kind to the project. This was accomplished by the beginning of February, and funding was released for use in the project. Upon receipt of funding, it was possible to acquire much of the material needed for the sites within the project. A careful analysis of material requirements was conducted, and sources for materials were identified. Most of the materials were purchased by the beginning of April in preparation for installation at the earliest opportunity. A formal request for a donation of trees was submitted to J.D. Irving Limited around this time. J.D. Irving Limited agreed to donate a mixture of red pines and willows to the project, totalling approximately 10,000 trees.

Upon completion of the above tasks, the implementation of site plans was able to begin. The next section of this report will provide site descriptions, goals, and plans as well as a description of plan implementation.

Site Descriptions and Activities

Audrey Sturk Property

This property is located in Aylesford. Ducks Unlimited Canada has undertaken the construction/restoration of a 2-acre wetland on this site. This site is in the Aylesford plain and is surrounded by farmland.

The following is a list of completed activities for this site:

- Construction of a 2-acre wetland

Vernon Saunders Property

This site is a vegetable farm in Auburn located on sandy loam soils that require irrigation on which Ducks Unlimited Canada constructed a combination irrigation and wildlife habitat project as part of Working by Water.

The following is a list of completed activities for this site:

- Construction of a 2.4-acre wetland

Fales River

The Fales River, in Greenwood, is a river on which CARP has, in previous years, undertaken fish habitat restoration activities. During the course of these activities, a problem area was identified. This area was a large, eroding slope above the bank of the river. Large amounts of sand and clay were being washed into the river during rainfalls. A plan was developed to use live sill construction to stabilize this slope.

The following is a list of completed activities for this site:

- 8 live sills constructed
- 25m² riparian zone reforested

Eight live sills were constructed on the eroding slope, above the bank at this site. This was done in order to lessen the grade of the slope, and to establish vegetation there. The results expected are a reduction of erosion, and a lessening of the sedimentation that has been occurring at this site.

Lilly Property (Farm)

This site is a beef operation, on which the majority of pastureland is located between Highway 1 and the north bank of the Annapolis River. The operation has a herd of approximately fifty cows. There are two small brooks and one ditch-like waterway that flow through the pasture into the Annapolis River. When the site was examined, it was noted that livestock had full access to the Annapolis River and the three waterways in their grazing area. Riparian buffers on the

Annapolis River were inadequate, and in some locations were lacking completely. This led to the development of a site plan focusing mainly on restriction of livestock access to the waterways, with the priority being the Annapolis River itself. The river was to be fenced out completely, as well as two of the waterways if time and resources permitted. Recycled plastic fence posts were to be used for fencing. These posts, fabricated with waste silage wrap generated on farms, were chosen for their durability, UV resistance, their inert nature, and for the fact that their production from recycled materials places less demand on natural resources. Crossings were to be constructed on the two brooks crossing the pasture, and gates were to be erected on each crossing to allow the brooks to be used as dividing lines between sections of pasture. Due to the fact that the cattle would no longer have access to fresh water for drinking, it was deemed necessary to install two watering systems to provide a source of water for the herd. Trees were to be planted along the entire riverfront on the Lilly property in order to help establish a healthy riparian buffer between the livestock grazing area and the Annapolis River.

The following is a list of completed activities for this site:

- 1100m of fencing installed
- 850 red pines planted
- 850 shrub willows planted
- 2 watering systems installed
- 2 crossings with gates installed
- 8500m² of riparian zone enhanced
- 11000m² of riparian zone protected
- Stewardship agreement signed

This site was the most intensive site within the project. The plan that was developed was to encompass all of the methods that were chosen to accomplish the project's goals excepting live sill construction. The result was to be a site on which all livestock access to the waterways was eliminated, and where the entire waterfront of the Annapolis River had undergone riparian zone restoration/enhancement activities (i.e. tree planting). Due to many factors including unforeseen difficulties in fencing some sites, weather, and time constraints, a portion of the fencing was not completed during the 2003 field season. The entire riverfront of the Annapolis River at this site was fenced at a distance of 10m from the water, but there still remains some fencing to be done on the brooks flowing through the pastures. The landowner still intends to continue implementing the plan independent of the project as time permits.

Ward Property (Hometosta Farm)

Hometosta Farm is a beef and dairy operation located in Bridgetown on Highway 1. The areas examined for inclusion in the project were two series of forage crop fields, one on the eastern side of the town of Bridgetown, and one on the Western side. The site on the east of Bridgetown was a series of three cornfields located on the north bank of the Annapolis River. The riparian buffer zone between the fields and the river was narrow and steep, and consisted mostly of grasses. The plan developed for this site was to plant a row of pines at the edge of the cornfield, and to bolster the existing riparian buffer zone with willows. This was to be done in order to expand and improve the existing buffer, and to help control erosion of the riverbank.

The site on the western side of Bridgetown consisted of two forage crop fields, one planted with corn, the other with alfalfa. The site was very similar to the one on the east side of Bridgetown in regard to riparian buffer zone characteristics, and the same plan was developed for that site as was developed for the other site. There is a brook

(Fash Brook) that separates the cornfield from the alfalfa field. Near Fash Brook's confluence with the Annapolis River there was found to be some severe erosion taking place on both sides of the brook's banks. This was adding much sediment to the brook. In order to remedy this situation, a plan was developed to use willow staking to stabilize the banks on both sides, and to establish vegetation on the exposed soils.

The following is a list of completed activities for this site:

- 900 red pines planted
- 900 shrub willows planted
- 60 willow stakes used to stabilize two banks
- 50 willow stakes used on top of bank as an experimental planting
- 9000m² riparian zone enhanced
- Stewardship agreement signed

This site plan was very straightforward, and its implementation was accomplished without complications or adjustment for the most part. A Watercourse Alteration Permit for bank stabilisation was obtained from the Department of Environment and Labour. The only necessary change from the original plan came about when the installation of live sills was undertaken. The banks at this site were very steep, augmenting the risk that disturbing the soils there could cause sedimentation of the brook. It was decided that willow stakes would simply be pounded into the bank without digging terraces for the construction of sills. This would eliminate the risk of sedimentation, and still allow the willows to become established on the bank, providing greater stability and creating a vegetative buffer.

Burton Messinger Property

This property is located in Centrelea, along Highway 201, on the south bank of the Annapolis River. This site is rented out as a crop field, and at the time the project was being conducted was being used as a bean field. The riparian buffer zone between the field and the river was found to be narrow and steep, and consisted mostly of grasses. There was much erosion taking place on the lower bank. Considering these things, it was decided that a row of pines would be planted along the edge of the crop field in order to widen and enhance the riparian buffer at this site, as well as to establish a root system that would aid in stabilizing the bank against further erosion.

The following is a list of completed activities for this site:

- 130 red pines planted
- 1300m² of riparian zone enhanced
- Stewardship agreement signed

This site plan went forward as expected. Pines were planted at a distance of 5m from the top of the bank along the entire length of the property.

Scott Ritchie Property

This site is located directly to the west of the Burton Messinger property. This site is sparsely forested with new growth, having been planted with spruce and fir in recent years. The bank of the river at this site is a sheer drop of nearly ninety

degrees. Erosion is severe, and vegetation is absent. The plan developed for this site was to plant a row of pines along the top of the bank, at a distance from the edge, in hopes that the trees would have time to establish a significant root system, and grow to a size that would allow them to help stabilize the bank before the erosion could reach them.

The following is a list of completed activities for this site:

- 360 red pines planted
- 3600m² of riparian zone enhanced

This site plan went forward as expected. Pines were planted at a distance of 5m from the top of the bank along the entire length of the property.

John Walker Property/ William Piggot Property

These two properties are located directly west of the Scott Ritchie property, and constitute a single site. They are two pieces of land that are rented out as a single agricultural field. At the time that this project was operating, this site was being used as a hay field. The bank of the river at this site is a sheer drop of nearly ninety degrees. Erosion is severe, and vegetation is absent. The plan developed for this site was to plant a row of pines along the top of the bank, at a distance from the edge, in hopes that the trees would have time to establish a significant root system, and grow to a size that would allow them to help stabilize the bank before the erosion could reach them.

The following is a list of completed activities for this site:

- 190 red pines planted
- 1900m² of riparian zone enhanced
- Stewardship agreement signed

This site plan went forward as expected. Pines were planted at a distance of 5m from the top of the bank along the entire length of the property.

Timothy Rice Property

The Timothy Rice property is divided into two sections. One is directly west of William Piggot's section of field, and the other section is on the west side of the Helen Messinger property that divides his land into the two sections. This site is similar to the Scott Ritchie property in that it has been planted in recent years with a mixture of spruce and fir. The bank is quite steep at this site, and erosion is severe. Very little vegetation is able to establish itself on the steeply graded, heavily disturbed slope. The plan developed for this site was to plant a row of pines along the top of the bank, at a distance from the edge, in hopes that the trees would have time to establish a significant root system, and grow to a size that would allow them to help stabilize the bank before the erosion could reach them. In addition to this, willows were to be planted between the row of pines and the top of the bank to aid in the stabilization, and to help establish vegetation on the eroded slopes of the bank.

The following is a list of completed activities for this site:

- 320 red pines planted
- 120 shrub willows planted
- 4400m² of riparian zone enhanced

This site plan went forward as expected. Pines were planted at a distance of 5m from the top of the bank along the entire length of the property. Shrub willows were planted along 120m of ditch running from the property to the river.

Helen Messinger Property

The Helen Messinger property is located between the two parcels of land owned by Timothy Rice. It is an agricultural plot that is rented out to a local farmer. While this project was in operation, the field was being used as a hayfield. The buffer strip between the field and the waters' edge at this site is fairly narrow, and the bank is steeply sloped and severely eroded. There is very little vegetation growing on the eroding bank at this site. The plan developed for this site was to plant a row of pines along the top of the bank, at a distance from the edge, in hopes that the trees would have time to establish a significant root system, and grow to a size that would allow them to help stabilize the bank before the erosion could reach them. In addition to this, willows were to be planted between the row of pines and the top of the bank to aid in the stabilization, and to help establish vegetation on the eroded slopes of the bank.

The following is a list of completed activities for this site:

- 90 red pines planted
- 90 shrub willows planted
- 900m² of riparian zone enhanced
- Stewardship agreement signed

This site plan went forward as expected. Pines were planted at a distance of 5m from the top of the bank along the entire length of the property. Shrub willows were planted along 60m of ditch running from the property to the river.

Thomas Rice Property

This site is located directly west of the western portion of the Timothy Rice property. It is a grassy, open field on which planting of spruce and fir has been attempted in recent years with limited success. A few small spruce and fir trees remain, though they do not cover a substantial portion of the property. The bank is quite steep at this site, and erosion is severe. Very little vegetation is able to establish itself on the steeply graded, heavily disturbed slope. The plan developed for this site was to plant a row of pines along the top of the bank, at a distance from the edge, in hopes that the trees would have time to establish a significant root system, and grow to a size that would allow them to help stabilize the bank before the erosion could reach them. In addition to this, willows were to be planted between the row of pines and the top of the bank to aid in the stabilization, and to help establish vegetation on the eroded slopes of the bank.

The following is a list of completed activities for this site:

- 650 red pines planted

- 650 shrub willows planted
- 6000m² of riparian zone enhanced

This site plan went forward as expected. Pines were planted at a distance of 5m from the top of the bank along the entire length of the property. Shrub willows were planted between the row of red pine and the top of the bank.

Bridson-Pateman Property

This site is located in Granville Centre. Ducks Unlimited Canada undertook the construction of a 2.2-acre wetland and a 2.8-acre riparian habitat area in a low wet section of field on this site.

The following is a list of completed activities for this site:

- Construction of a 2.2-acre wetland
- Establishment of 2.8 acres of riparian habitat

Bishop Property (Bishop Family Farm)

The Bishop Family Farm is a large dairy and beef operation located off Highway 201 in Round Hill. There is much pastureland associated with this operation along the banks of both the Annapolis and Round Hill Rivers. The bank of the Annapolis River at one location on this site was found to be eroding rapidly. This bank is very high and steep, and is composed mostly of sand and clay. There is a flat area at the foot of the steep bank where there is vegetation growing between the slope and the river at most times of the year. However, when the water level is high enough, the flow comes in contact with this steep bank, washing material away from the foot of the slope and causing further erosion. This is also a concern because of the sedimentation this is causing to the Annapolis River. In order to remedy this situation, the plan consisted of building live sills covering a portion of this slope in hopes that the method would succeed in lessening the grade, stabilizing the soils, and establishing vegetation there. This experimental solution would act as a guide for future activities intended to stabilize the significant area over which the described process of erosion is occurring.

Much of the pastureland at this site is along the Round Hill River, in the area just upstream of its confluence with the Annapolis River. Livestock were found to have direct access to the Round Hill River, as well as several small waterways flowing into the river. The first plan developed with the Bishop Family Farm included fencing to restrict cattle access to a large portion of the Round Hill River, and planting pines and willows between the fence line and the water's edge in order to establish and maintain a healthy riparian buffer zone between the pastureland and the river. This was later removed from the plan, as funding did not appear sufficient to allow for this portion of the site plan. As the project progressed, it appeared that it would be possible to fence and plant the area previously slated for these activities, as well as to maybe extend the previously planned fence to include a larger area of pasture than was anticipated when the plan was developed.

The following is a list of completed activities for this site:

- 600 red pines planted
- 1400 shrub willows planted

- 15 live sills constructed
- 3 willow stake bundles buried
- 50 willow stakes used to on top of bank as an experimental planting
- 500m of fencing installed
- 5000m² riparian zone protected
- 8500m² riparian zone enhanced
- Stewardship agreement signed

After the amendments to the site plan described above had taken place, the implementation of the plan was completed as expected. A Watercourse Alteration Permit for bank stabilisation was obtained from the Department of Environment and Labour. Fifteen live sills were constructed on the steep, eroded bank described above, and three bundles of shrub willow stakes were buried in the bank in hopes that they would sprout in the spring. At the top of the eroding slope, two rows of willow stakes were pounded into the ground as an experimental planting. On the portion of pastureland included in the site plan, red pines were planted in a furrow ploughed by the landowner at a distance of 5m from the water along 600m of the Round Hill River. Shrub willows were planted between the row of pines and the river along this 600m stretch, as well as along both sides of 100m of ditch running through the pasture to the Round Hill River.

Larry Hudson Property (Hudson Farm)

Hudson Farm is a beef operation located in Port Wade, along the Annapolis Basin. The focus for this site was on pastureland through which a small brook was flowing. Cattle crossed the brook at two separate sites to get to other grazing areas and to and from the barn. This constant traffic of cattle through these two points on the brook was causing degradation of the banks, sedimentation of the waterway, and was a direct source of contamination of the brook. The installation of two crossings, one at each of the locations where the cows were already crossing, was planned in order to remedy the situation.

The following is a list of completed activities for this site:

- 2 water crossings installed
- Stewardship agreement signed

This site plan was completed as anticipated. The two culverts were installed upon acquisition of permission from the Department of Environment and Labour.

Earl Acker Property

This property is located in Clementsvale. Duck Unlimited Canada undertook the construction of 3.5 acres of combined wetland and riparian zone restoration on the edge of agricultural fields on this site.

The following is a list of completed activities for this site:

- Construction of a 1.2-acre wetland
- Restoration of 2.3 acres of riparian zone

Brundels Property

This property is located in Upper Granville. Ducks Unlimited Canada has undertaken the construction/restoration of a wetland and some riparian habitat on this site.

The following is a list of completed activities for this site:

- Construction of a 2.8-acre wetland
- Restoration of 3.6 acres of riparian habitat

Note: Topographic maps and aerial photographs for each site are included in the appendices.

Summary of Accomplishments

The Working by Water project was, overall, implemented successfully. In the case of some of the project's goals, such as the number of participants, the number of trees anticipated to be planted, and the number of square meters of riparian zones to be restored, more was able to be achieved than was first anticipated. Throughout this project, the possibility of collaborating with agricultural landowners in an effort to achieve more environmentally sound practices in the area of agriculture has been demonstrated. The following list shows the cumulative results of activities conducted at all sites within the project.

- 124,625 square meters of riparian zone enhancement/restoration
- 9,700 trees planted
- 16,000 square meters of riparian zone protected
- 1600 meters of fencing installed
- 4 livestock crossings installed
- 2 gates Installed on crossings
- 2 watering systems installed
- 23 live sills constructed
- 3 willow bundles buried
- 60 willow stakes used to stabilize eroding banks
- 100 willow stakes used in experimental plantings
- 5 wetlands constructed (43,000 m² of wetland constructed and 35,000 m² of riparian habitat)
- 7 stewardship agreements signed

APPENDICES

APPENDIX A - Contribution Agreement

APPENDIX B - Letters of Participation

APPENDIX C - Stewardship Agreements

APPENDIX D - Topographic Maps Showing Site Locations

Appendix D – Topographic maps showing site locations

- 1 – Fales River: Greenwood, 21A/15 UTM20 03 47800 4980100
- 2 – Vernon Saunders Property: Auburn, 21H/2 UTM20 0351000 4987000
- 3 – Audrey Sturk Property: Aylesford, 21H/2 UTM20 0351800 4987000
- 4 – Earl Acker Property: Clementsvale, 21A/12 UTM20 0295000 4942300
- 5 – Bridson-Pateman Property: Granville Centre, 21A/14 UTM20 0302500 4960200
- 6 – Larry Hudson Property (Hudson Farm): Port Wade, 21A/12 UTM20 0285300 4950800
- 7 – Bishop Property (Bishop Family Farm): Round Hill, 21A/14 UTM20 0307300 4960000
- 8 – Lilly Property (Farm): Lawrencetown, 21A/14 UTM20 0327200 4971600
- 9 – Ward Property (Hometosta Farm): Bridgetown, 21A/14 UTM20 0317600 4967700
and 0320800 4968500
- 10 – Burton Messinger Property: Centrelea, 21A/14 UTM 20 0316500 4966200
- 11 – Scott Ritchie Property: Centrelea, 21A/14 UTM 20 0316200 4966200
- 12 – John Walker Property/William Piggot: Centrelea, 21A/14 UTM 20 0315900 4966200
- 13 – Timothy Rice Property: Centrelea, 21A/14 UTM 20 0315700 4966150
- 14 – Helen Messinger Property: Centrelea, 21A/14 UTM 20 0315600 4966100
- 15 – Thomas Rice Property: Centrelea, 21A/14 UTM 20 0315500 4966000
- 16 – Brundels Property: Upper Granville, 21A/14 UTM 20 0313600 4965600

APPENDIX E - Aerial Photos of Sites

Bishop Family Farm (Round Hill)



LEGEND:

- 1- Pine trees and willow shrubs planted, and electric fence installed
- 2- Pine trees and willow shrubs planted
- 3- Ditches planted with willow shrubs
- 4- Farm
- 5- Live sills

Lilly Property (Lawrencetown)



LEGEND:

- 1- Pine trees and willow shrubs planted, and electric fence installed
- 2- Alternative watering systems
- 3- Water crossings
- 4- Farm

Centrelea Properties (Centrelea)



LEGEND:

- 1- Burton Messinger Property: Pine trees planted
- 2- Scott Ritchie Property: Pine trees planted along the riverfront and ditches
- 3- John Walker/William Piggot Property: Pine trees planted
- 4- Timothy Rice Property: Pine trees and willow shrubs planted
- 5- Helen Messinger Property: Pine trees and willow shrubs planted
- 6- Timothy and Thomas Rice Property: Pine trees and willow shrubs planted

Ward Property (Bridgetown)

Photo of western side of Bridgetown



Ward Property (Bridgetown)

Photo of eastern side of Bridgetown



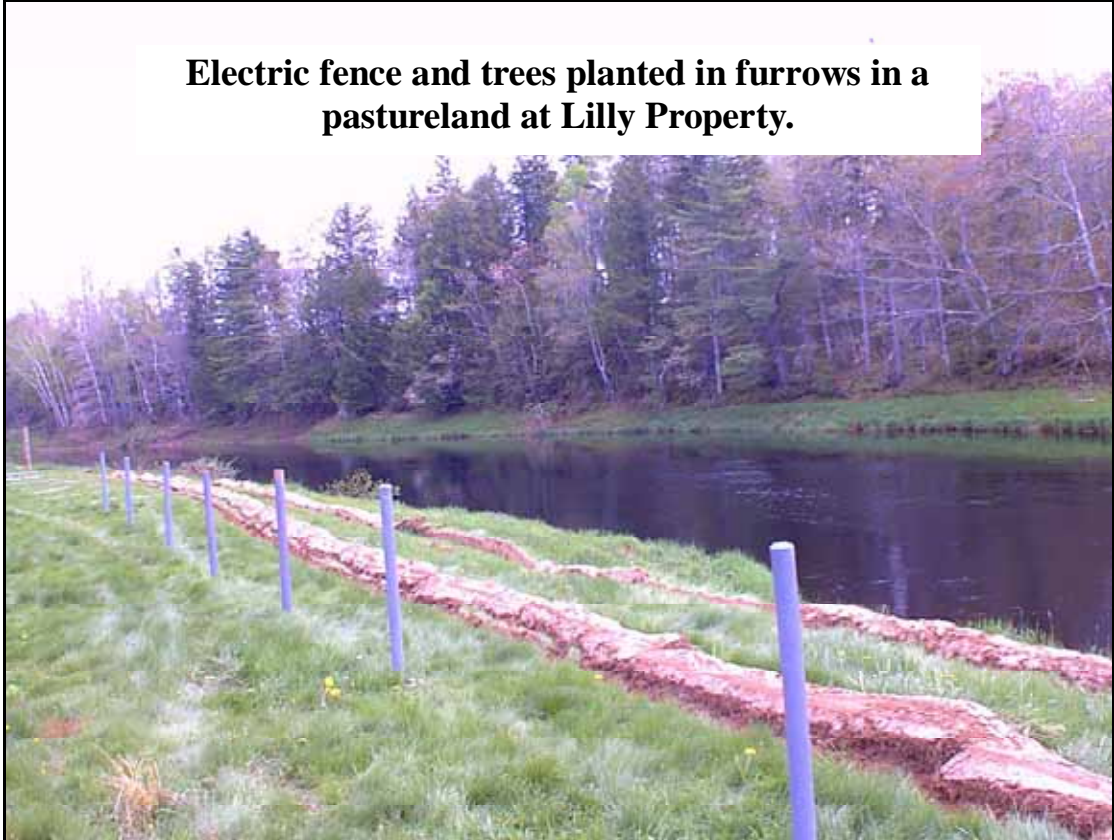
LEGEND:

- 1- Pine trees and willow shrubs planted
- 2- Willow staking
- 3- Farm

APPENDIX F - Media Releases

APPENDIX G - Miscellaneous Photos

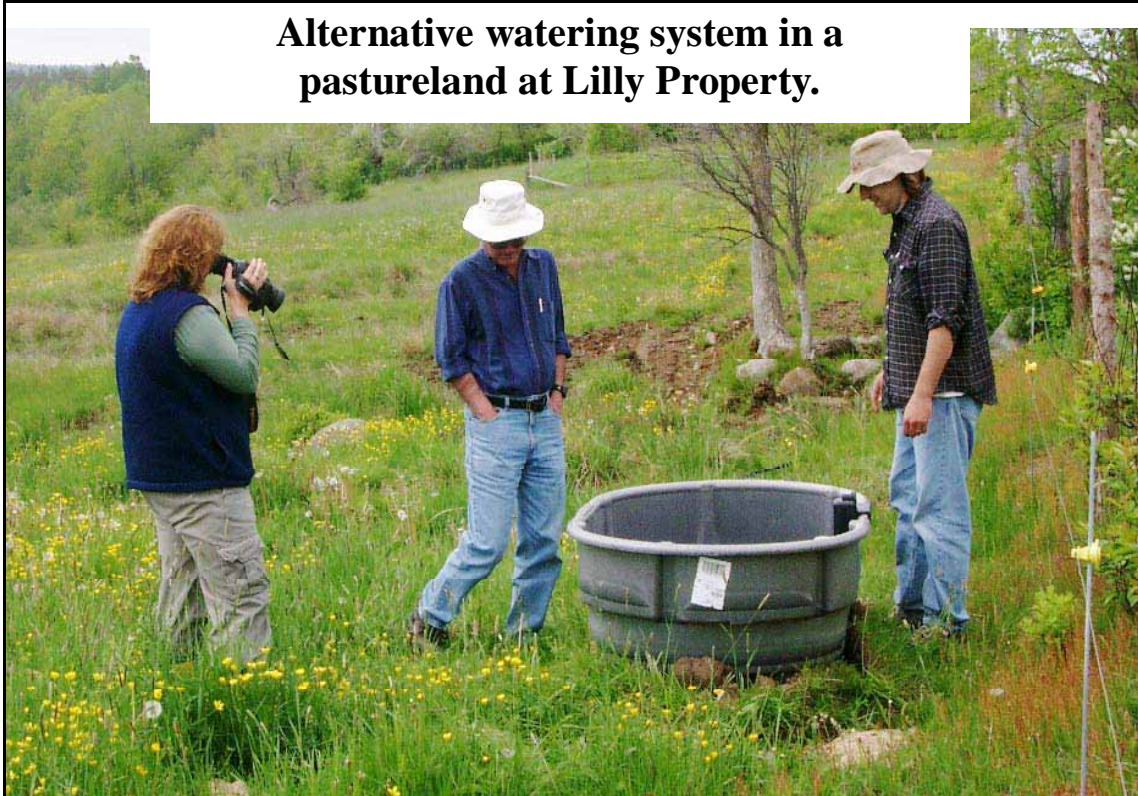
Electric fence and trees planted in furrows in a pastureland at Lilly Property.



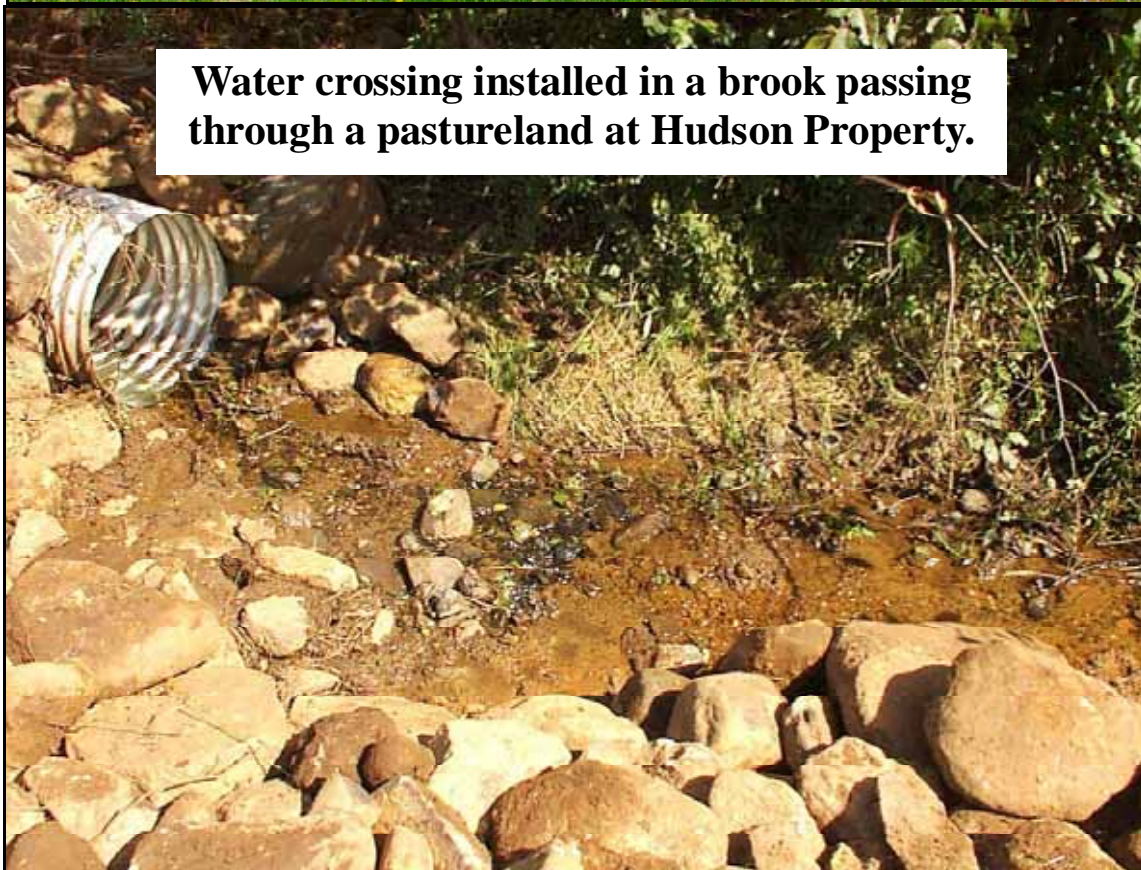
Willow shrubs planting at Bishop Farm.

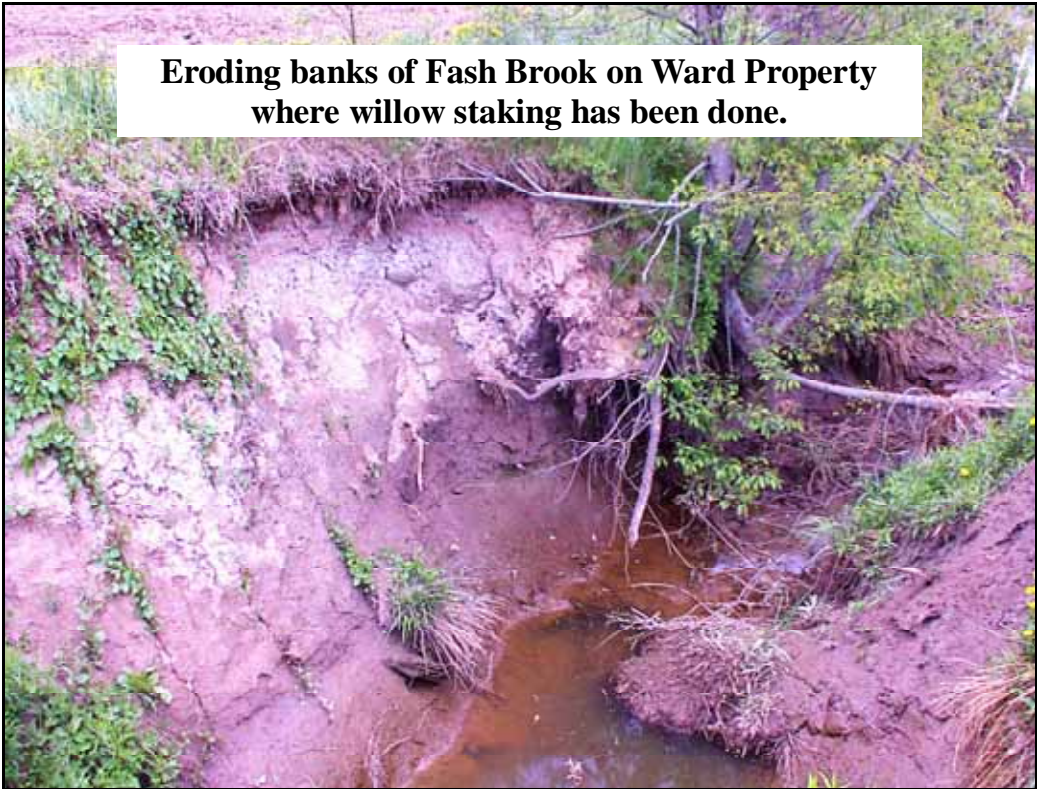


Alternative watering system in a pastureland at Lilly Property.

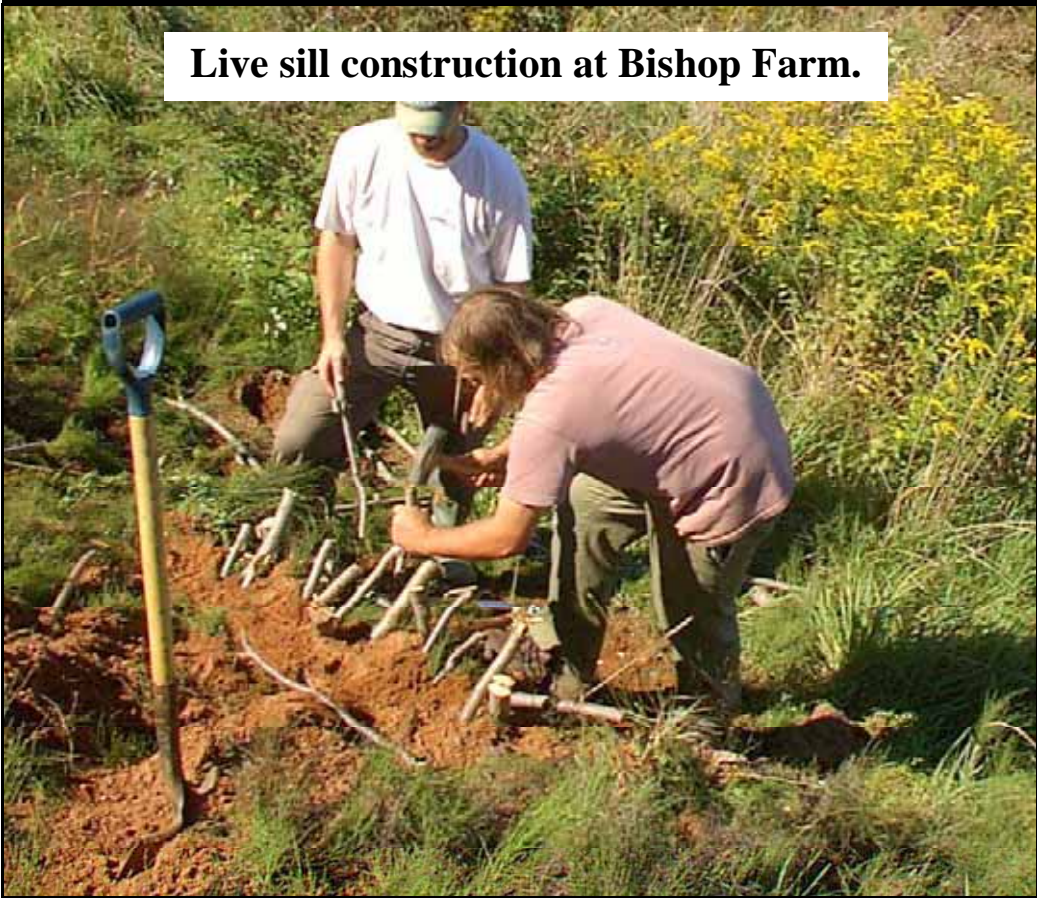


Water crossing installed in a brook passing through a pastureland at Hudson Property.





Eroding banks of Fash Brook on Ward Property where willow staking has been done.



Live sill construction at Bishop Farm.

