Riparian Zone Workshop 2000

Using Buffers to Improve Ontario Waterways

PROCEEDINGS

Canada Centre for Inland Waters Burlington, Ontario

May 17, 2000

ACKNOWLEDGEMENTS

These proceedings were compiled and produced for distribution to the participants of the ***Riparian Zone Workshop: Using Buffers To Protect Ontario Waterways*** that was held on May 27, 2000. Many thanks to the over 140 participants in this workshop. Summaries of the breakaway sessions, as well as summaries of the speakers' papers are included. These thoughts, observations and recommendations will help to mold the next steps in our goal of Riparian Zone Management in Ontario.

I wish to thank the members of the Riparian Zone Workshop Committee for their professionalism, enthusiasm and commitment to the concept of riparian management. Their contribution guaranteed the success of this workshop. Members to date include:

Ontario Soil and Crop Improvement Association
Ontario Cattlemen's Association
Grand River Conservation Authority
Ontario Ministry of Natural Resources (OMNR)
Ontario Ministry of the Environment - Watershed Standards Branch (OMOE)
Environment Canada – Canadian Wildlife Service
Ontario Ministry of Agriculture, Foods and Rural Affairs (OMAFRA)
Fisheries and Oceans Canada - Fish Habitat Protection Branch
Wellington County Stewardship Council
University of Guelph
Ducks Unlimited

On behalf of the Committee, I would like to extend our gratitude and appreciation to all the speakers over the duration of the workshop. Their presentations were vital to the success of the workshop and were key to stimulating lively discussions in the breakaway sessions.

I would also like to thank the financial supporters and the many contributors - without their assistance this workshop would not have been possible. Our list of contributors:

Ducks Unlimited Canada
Ministry of Natural Resources
Fisheries and Oceans Canada
Ministry of the Environment
Environment Canada Great Lakes 2000 Clean Up Fund
National Water Research Institute
Eastern Habitat Joint Venture

Grand River Conservation Authority
Special mention to the GRCA for their provision of staff and office logistics.

Special thanks goes out to Jennifer Deter and Shari Muscat of the Grand River Conservation Authority for their work in organizing the logistics for the workshop and the preparation of these proceedings.

Jack Imhof
Workshop Chairperson
Ministry of Natural Resources
September, 2000

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GENERAL OVERVIEW OF RIPARIAN ZONE/BUFFER FUNCTIONS

Riparian Zone Functions

HYDROLOGY

- Flood flow management;
- Reduce flood velocities;
- Shallow groundwater management;
- Bank storage

GEOMORPHOLOGY

- sediment capture,
- bank and channel stability
- floodplain structure, erosion/ deposition,

WATER QUALITY

- Nutrient uptake,
- Attenuation of bacteria,
- Temperature moderation

ECOLOGY

- Enhance fish habitat,
- Wildlife habitat;
- Enhance nutrient management

DO WE MANAGE BY BUFFERS ONLY OR BY FUNCTIONS WE WISH TO CREATE OR MAINTAIN?

1.0 OBJECTIVES AND RELATED INITIATIVES

Objectives

- Provide an overview of the state of science and state of practice
- To synthesize lessons learned
- To develop new partnerships and opportunities for management
- To recommend future directions for research, management and stewardship

Related Initiatives

- Stream Corridor Management - An adaptive management approach (stream channel and valley integration)
- Riparian Zone BMP Manual - being co-ordinated by MOE with multiple partners
- Buffer Strip Best Management Practices Book - spearheaded by Ontario Cattlemans Association
- Electronic Survey of riparian/buffer projects/programs – University of Guelph and Riparian Zone Working Group

Funded Project 1999/2000 -Study Proposal – See Nancy Tilts presentation

- Revisit previously done restoration sites to determine: Satisfaction (qualitative and quantitative); What works & What does not?
- Collect pictures, fact sheets, data, Additional $'s
- Ask proponents and farmers for input.
- Funding provided by MOE & Riparian Zone Working Group
- Use 40 Permanent Cover project sites - Project co-ordinated by OSCIA and GRCA

1OVERVIEW OF 1998 WORKSHOP

Jack Imhof - MNR

Two day workshop
- Day 1 - State of the Science (Literature Review, Issues, and Ongoing Research updates)
- Day 2 - State of the Practice (issues, attitudes, what works, practical examples)

Goal
- To foster dialogue between riparian owners and managers in order to initiate discussion towards a strategic approach for the management of riparian zones/buffers in rural Ontario

Objectives
- Overview of riparian zone functions
- Review present approaches to management of riparian zones in Ontario
- Determine what techniques work to motivate
- Brainstorm and review alternative mechanisms and approaches

Workshop Outcomes/Findings
- Need definition that encompasses a functional description of Riparian Zones - a “buffer” is only one of several “functions” of a riparian zone
- Where the riparian zone is lost, tools such as subwatershed planning and Natural Channel Initiative provide key tools to the restoration of these systems

Knowledge Gaps
- Many research bits and pieces are available, but the puzzle is not put together yet.
- Need for a strong inter-disciplinary approach in order to understand
- Thresholds of change, Cause: Effect, Trade-offs: consequences
- Requires economics, social, physical, water quality and biological integration

Implementation Issues
- Need a program that provides positive incentives
- Funding - voluntary, long-term and maintenance is important
- Landowner awareness is key but economic considerations play an important role
- Knowledge, access to tools, materials and technical assistance is important
- Approach is different depending if rural or urban/urbanizing - considerations for co-operation

Where to go From Here?
- Strong interest in follow-up workshops
- Working with landowners in implementation/stewardship approaches
- Strong interest in developing research agenda between researchers and managers
- Possibility of development of new tools and fact sheets about riparian function, etc. I.e. Riparian zone BMP’s for: water treatment from fields and tiles; designs for self-maintaining drains
- Assessment module to assess environmental and economic potential of riparian zone

management. I.e. Use of riparian zones to offset major effects of increased climate variability (reduce erosion, improve WQ, enhance baseflow, retain soil)

3.0 WORKSHOP PRESENTATIONS

3.1 RIPARIAN RIGHTS AND REGULATION

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INTRODUCTION

- I work with landowners, land trusts and agencies, particularly with stewardship techniques such as conservation easements and tax incentives
- Outline: - regulatory roles: need for regulation and agencies' regulatory roles
    - riparian rights and regulatory authorities
    - new developments

1. REGULATORY ROLES

Why the Need for Regulation?

Look at the regulatory approach in comparison with litigation (private law suits) and voluntary actions by landowners. Each has a valuable role. A regulatory approach:

- Codifies years of experience and responses to problems
- Identifies location of jurisdiction and expertise
- Ensures expertise is provided for activities
- Avoids infringement of others' rights
- Provides for efficient and fair management and neutral arbitration of various rights (compared with people suing each other under private rights)
- Expands opportunities for public involvement
- Promotes consistency and reliance

- Addresses problem of "bad apples"
- Allows for wider range of remedies eg. Prevention, restoration
- Accomplishes public objectives (habitat, flood control, navigation)
- Provides framework, backboard for stewardship efforts
- Provides direction and backstop for negotiations
- Saves money and costs - $1 billion/yr from GTA sprawl, flood assistance, habitat restoration (eg. Nawmp, wetland habitat fund)

Thus, there is a need and role for regulation, in conjunction with other tools such as land management, securement, research and education.

Who Does What?

- Municipalities - land use planning, tree cutting
- Conservation Authorities - flood control, filling, land use planning, *Fisheries Act*
- Ministry of the Environment - water pollution, water taking, water-based land use planning, environmental assessment
- Ministry of Natural Resources - wildlife, public lands, dams; hazard, aggregates and natural heritage land use planning
- Department of Fisheries and Oceans - water pollution, "fish" habitat

2. PRIVATE RIPARIAN RIGHTS

- Landowners whose properties touch on surface watercourse (not groundwater)
- Common law rights to continued flow of water in its natural quantity and quality
- Examples: upstream owners can't unreasonably decrease or increase flow; downstream owners can't dam and thus flood or refuse to accept natural flow from upstream owners
- Owners are entitled to reasonable use: household taking, ordinary drainage
- Liability in civil action to other riparian owners; can show cumulative impacts
- No need to show actual injury, but must show activity will continue to cause further alteration, water is made less suitable for some purpose, and activity caused alteration
- Defence of statutory authority, eg. To construct dams, drains, water lines, sewers (specific, broad defence in owra covering public agencies, industrial polluters, storm sewers, but allows "injurious affection" claim for municipal sewage works)
- Remedies are damages or injunction

3. RIPARIAN REGULATORY AUTHORITIES

Regulatory authority arose to provide integrated administration of large number of private rights,

achieve public benefits and address past problems. There is a broad range of regulatory authority at the municipal, watershed, provincial and federal levels. Regulation authority may also arise from ownership of land, such as specifying what visitors or lease holders can do, or granting a conservation easement. Some incentive and grant programs have requirements that can also govern riparian activities by those qualifying for these programs.

General Riparian Authority

- *Conservation Authorities Act* - conservation, research, wetlands

Wildlife and Habitat

- *Fisheries Act* - "fish" and habitat
- *Municipal Act* and *Forestry Act* - tree cutting
- *Fish and Wildlife Conservation Act*, *Endangered Species Act*, federal *Migratory Birds Convention Act* and proposed *Species at Risk Act* - species and habitat

Water Quality and Quantity

- *Ontario Water Resources Act* - water quality and quantity
- *Environmental Protection Act* - pollution, waste management
- *Lakes and Rivers Improvement Act* - refuse, deposited substances
- *Fisheries Act* - "deleterious substances" (potential, not just actual, harm)
- *Conservation Authorities Act* - flood control, watercourses
- *Drainage Act* - land drainage, drain maintenance and funding
- private rights: riparian, public and private nuisance, trespass, etc.

Land Use

- *Planning Act* - Provincial Policy Statement (water quantity and quality, fish habitat, wetlands, valleylands, adjacent lands - 50m or more), official plan policies, zoning by-laws, subdivision, site planning*;* Act allows for detailed biophysical data in applications and creative protection and use of riparian zone*;* see Natural Heritage and Hazard Reference Manuals
- *Canadian/Environmental Assessment Act* - impact assessment, public involvement*;* classes of activities which govern governments

Waterway Obstructions

- *Conservation Authorities Act* - cut and fill
- *Public Lands Act* - shorelands (to highwater mark), beds of navigable waters
- *Lakes and Rivers Improvement Act* - dams, obstructions

- Depa*rtment of Transport Act, Navigable Waters Protection Act* - canals, navigation
- *Topsoil Preservation Act* - soil removal under municipal by-law

4. NEW DEVELOPMENTS

Legislation

- CAA, s.28 amended: CA regulation of wetlands and development, rehabilitation order as new remedy, increased fines
- LRIA amended: repealed parts of Act, allowed broad exemptions
- proposed SARA: prevention of harm to listed species, residual habitat role

Administration

- **some fisheries administration shifted from MNR to CAs**
- **DFO: new regional offices and staff, tougher authorizations for fish habitat**
- **MNR has exempted regulation under LRIA but picky about PLA approvals**
- **MOE now regulates water-takings more closely, with each site licenced**
- **general trends: - downloading: planning to municipalities, fisheries to CAs**
  - less provincial funding: CAs, MNR, MOE cuts

CONCLUSIONS

- Summary: need for regulation, range of agencies and authorities, private rights, changes in legislation and administration
- Increasing recognition of need for conservation of riparian zone
- Some increases and some decreases in legislative authority
- Less agency expertise and consistency across province
- Shifts responsibilities to conserve riparian zone to local, non-expert, citizenry
- This increases involvement but also increases costs: to obtain and duplicate expertise, and by making mistakes
- Still, through combination of good planning, regulation, land securement and management can accomplish conservation and careful use of the riparian zone.

3.2 INCENTIVE PROGRAMS

Steve Davis, Ohio Natural Resources Conservation Service

This section was gathered from Steve Davis's presentation material and the following pertinent websites:

www.buffercouncil.org
http://www.nhq.nrcs.usda.gov/CCS/Buffers.html

Overview

Theme: Buffers: Common-sense conservation
***Purpose*:** To encourage the use of conservation buffers by agricultural producers and other landowners--in both rural and urban settings.
Goal: To install 2 million miles (up to 7 million acres) of conservation buffers by the year 2002.

In April 1997, USDA officially launched the new National Conservation Buffer Initiative and pledged to help landowners install 2 million miles of conservation buffers by the year 2002. Agricultural producers and other landowners who install buffers can improve soil, air, and water quality; enhance wildlife habitat; restore biodiversity; and create scenic landscapes.
The initiative is led by the Natural Resources Conservation Service (NRCS) in cooperation with the Agricultural Research Service, Farm Service Agency; Forest Service; Cooperative State Research, Education, and Extension Service; state conservation agencies; conservation districts; and numerous other public and private partners. To help implement the initiative, NRCS designated:

- an agricultural coordinator to work with the National Corn Growers Association in St. Louis to promote buffers among corn growers and other agricultural groups
- a liaison with the National Pork Producers Council to work, in part, to promote the acceptance of conservation buffers as a means of aiding livestock manure management efforts.

The National Conservation Buffer Initiative encourages farmers and ranchers to understand the economic and environmental benefits of buffer strips and use these practices through the various programs in the conservation tool kit. Programs used for this effort include the continuous Conservation Reserve Program (CRP) sign-up, as well as the Environmental Quality Incentives

Program (EQIP), Wildlife Habitat Incentives Program (WHIP), Wetlands Reserve Program (WRP), Stewardship Incentives Program (SIP), and Emergency Watershed Protection Program (EWP).To date, approximately 619,000 acres -- or nearly 172,000 miles --of buffers have been established under the CRP continuous sign-up. Additional conservation buffers are being installed through other programs.

The Buffer Partnership

Seven private sector firms, organized as the National Conservation Buffer Council, have pledged more than $1 million over three years to complement USDA's efforts to promote the acceptance of conservation buffers among producers. The seven are Cargill, ConAgra, Farmland Industries, Monsanto, Novartis Crop Protection, Pioneer Hi-Bred International, and Terra Industries. Conservation buffers not only represent profitable, common-sense conservation for individual landowners, but the use of buffers has also drawn the endorsement of many major agricultural companies and leading agricultural and conservation organizations. Because these groups know the importance of sound conservation practices, for individual landowners and the entire economy, they have pledged their organizational support by joining USDA's National Conservation Buffer Team. To date, the team includes nine federal agencies, the National Conservation Buffer Council, and more than 75 nonprofit agricultural and environmental organizations.

Conservation Buffers

Conservation buffers are small areas or strips of land in permanent vegetation, designed to intercept pollutants and manage other environmental concerns. Buffers include: riparian buffers, filter strips, grassed waterways, shelterbelts, windbreaks, living snow fences, contour grass strips, cross-wind trap strips, shallow water areas for wildlife, field borders, alley cropping, herbaceous wind barriers, and vegetative barriers.

Strategically placed buffer strips in the agricultural landscape can effectively mitigate the movement of sediment, nutrients, and pesticides within farm fields and from farm fields. When coupled with appropriate upland treatments, including crop residue management, nutrient management, integrated pest management, winter cover crops, and similar management practices and technologies, buffer strips should allow farmers to achieve a measure of economic and environmental sustainability in their operations. Buffer strips can also enhance wildlife habitat and protect biodiversity.

Benefits of Buffers

Conservation buffers slow water runoff, trap sediment, and enhance infiltration within the buffer. Buffers also trap fertilizers, pesticides, pathogens, and heavy metals, and they help trap snow and cut down on blowing soil in areas with strong winds. In addition, they protect livestock and wildlife from harsh weather and buildings from wind damage. If properly installed and maintained, they have the capacity to:

- remove up to 50 percent or more of nutrients and pesticides.
- remove up to 60 percent or more of certain pathogens.
- remove up to 75 percent or more of sediment.

Conservation buffers reduce noise and odor. They are a source of food, nesting cover, and shelter for many wildlife species. Buffers also provide connecting corridors that enable wildlife to move safely from one habitat area to another.

Conservation buffers help stabilize a stream and reduce its water temperature. Buffers also offer a setback distance for agricultural chemical use from water sources.Like the trim on a house makes the house look better, well-planned conservation buffers improve the appearance of a farm or ranch. If used as part of a comprehensive conservation system, buffers will make good use of areas that often should not be cropped.

Key Messages

1.Conservation buffers protect soil, improve air and water quality, enhance fish and wildlife habitat, conserve biodiversity, and beautify the landscape.
2.Conservation buffers allow farmers and ranchers to express their commitment to conservation--their willingness to share responsibility for environmental improvement across our country.
3.In some cases, conservation buffers may help farmers and ranchers meet pollution control requirements.
4.The continuous Conservation Reserve Program (CRP) sign-up and other programs--including the Environmental Quality Incentives Program (EQIP), Wildlife Habitat Incentives Program (WHIP), Wetlands Reserve Program (WRP), Emergency Watershed Protection Program (EWP), and Stewardship Incentives Program (SIP)--offer farmers and ranchers economically attractive incentives to install and maintain conservation buffers.
5.Producers who offered acres for enrollment that were not accepted in the 1997 CRP sign-ups have the opportunity to enroll portions of those acres as conservation buffers under the continuous CRP sign-up

6. Producers who have land under expiring CRP contracts that will go back into crop production can leave conservation buffers in place and enroll those buffer acres under the continuous CRP sign-up.
7. The continuous CRP sign-up requires no competitive offer by landowners. All offers of land are automatically accepted if all eligibility requirements are met and the landowner is willing to accept the prescribed rental rate and whatever incentive might be available for a certain buffer practice. Rental rates are based on the productivity of soils and cash rent for comparable land in a county.
8. Conservation buffers pay: filter strips, riparian buffers, grassed waterways, and field windbreaks earn a 20 percent incentive; designated wellhead protection areas earn a 10 percent incentive.
9. Up to 50 percent cost sharing is allowed for the establishment of conservation buffer practices under the continuous CRP sign-up. In many locations, other public or private programs will pay for the remaining 50 percent.

Who is the National Conservation Buffer Council?

To help address growing concerns over the impact farming has on water quality, seven of the nation's largest agri-businesses came together to form the National Conservation Buffer Council (NCBC). NCBC Members include: **Cargill, Incorporated**; **ConAgra, Inc**.; **Farmland Industries, Inc**.; **Monsanto Company**; Novartis Crop Protection, Inc.; **Pioneer Hi-Bred International, Inc**.; and **Terra Industries, Inc**. Other organizations assisting NCBC are the National Corn Growers Association and the National Council of Farmer Cooperatives.
NCBC is a non-profit, private sector organization dedicated to the promotion of agricultural conservation practices, particularly buffers, that address water quality concerns. NCBC communicates the potential environmental and economic benefits of establishing buffers on farms and ranches. NCBC works in conjunction with the U.S. Department of Agriculture's Natural Resources Conservation Service. Together, we hope to reach a goal set by Secretary Dan Glickman: 2 million miles of buffers by 2002. NCBC and its member companies promote buffers because they are good for the environment and they can help reduce the need for substantial new regulation of farming practices in the future -- goals farmers and agri-businesses share. As we say, buffers are a way to show your stewardship and protect your productivity.

Incentives for buffer establishment

The economic factors of buffers look even better when you consider that there are a variety of financial incentives offered by USDA and by many state governments. Before beginning any buffer project, check with your local USDA Service Center or Conservation District office about the incentives available in your area.

For many landowners, the most attractive program providing financial assistance for installing buffers is the continuous signup option of the Conservation Reserve Program (CRP). Under the continuous signup, there is no national competition to enroll land and no long waiting for offers to be evaluated in Washington. If you have land suitable for certain buffer practices and agree to the annual payment rate, which is determined by soil type, your offer is considered immediately accepted under the continuous signup for contracts of up to 15 years. And on top of the annual payment, you receive a yearly bonus of 20% for filter strips, riparian buffers, grassed waterways and field windbreaks.

On April 13, USDA announced new incentives for participants in continuous signup including one-time "signing bonus," additional cost-share assistance and new payment rates for marginal pasturelands.

USDA offers other programs to encourage the establishment of buffers including the Environmental Quality Incentives Program, the Wetlands Reserve Program, and the Wildlife Habitat Incentives Program. And technical assistance on buffer establishment is available from local employees of USDA's Natural Resources Conservation Service (NRCS).

Finally, many states offer a variety of incentives for establishing buffers. USDA and eleven states -- Delaware, Illinois, Maryland, Minnesota, New York, North Carolina, Ohio, Oregon, Pennsylvania, Washington and Virginia -- are cooperating in an especially lucrative program called the Conservation Reserve Enhancement Program, or CREP. Those state governments provide financial incentives in addition to CRP payments in designated watershed areas.

Again, your local NRCS conservationist can tell you all about the incentives available in your area for buffers. For more information on USDA's programs, you can also call the NRCS helpline at 1-888-LANDCARE.

a. **STEWARDSHIP OF OUR LAND AND WATER RESOURCES ON PRINCE EDWARD ISLAND - "A PROACTIVE APPROACH"**

Clair Murphy, Director, Water Resources, Fisheries and Aquaculture, Province of Prince Edward Island

Firstly, I would like to thank the organizing committee for inviting me to take part in the Riparian Zone Workshop 2000. It is in deed a pleasure for me to be here today. What I will be talking about in the next half hour or so is the new waterway protection legislation that has recently come into affect on Prince Edward Island. I will detail the contents of amendments to the Prince Edward Island *Environmental Protection Act* that became law on April 1, 2000.

I am referring, of course, to the riparian buffer zone legislation that places restrictions on agricultural crop production, the location and operation of intensive livestock operations, urban development and forest harvesting adjacent to watercourses and wetlands in the province.

You will note from the title of my presentation that I used the phrase "proactive approach" to improving the stewardship of our land and water resources. For those of you that are familiar with non-point sources of contamination, including those related to agricultural activity, you will understand how difficult it is to force changes in land use policy and land use practices using the "reactive" or "enforcement" approach. Like most other jurisdictions, Prince Edward Island has not been very successful using that approach. Consequently, the province has chosen to take more preventive or proactive measures in the form of mandatory riparian buffer zones.

Before I move into a discussion of the details of the new legislation I would like to spend a minute or two talking about the types of water quality and wildlife habitat issues we have on Prince Edward Island that the new legislation was designed to address.

In terms of the actual proportion of our landmass that is used for agricultural use, Prince Edward Island is the most intensively farmed province in Canada. Of the total landmass of 1.4 million acres, in the order of 550,000 acres is in agricultural production. The vast majority of that acreage is concentrated in the central part of the province where some drainage basins are over

80% cleared for agricultural purposes.

Soils on Prince Edward Island are relatively shallow with bedrock within 1 - 2 meters of the surface in many areas. The fine sandy loam soils are naturally acidic, low in organic matter and highly erodible.

Prince Edward Island has a gently rolling landscape with the most hilly areas being in the central part of the province where agricultural crop production is most intense. This has resulted in serious soil erosion and surface water runoff problems, particularly where row crops are produced on long slopes. In addition to soil erosion, other land use related impacts from agricultural activity include nutrient enrichment of streams, ponds and estuaries by the erosion and leaching of nitrogen and phosphorus, pesticide contaminated land wash and bacterial contamination of shellfish harvesting areas.

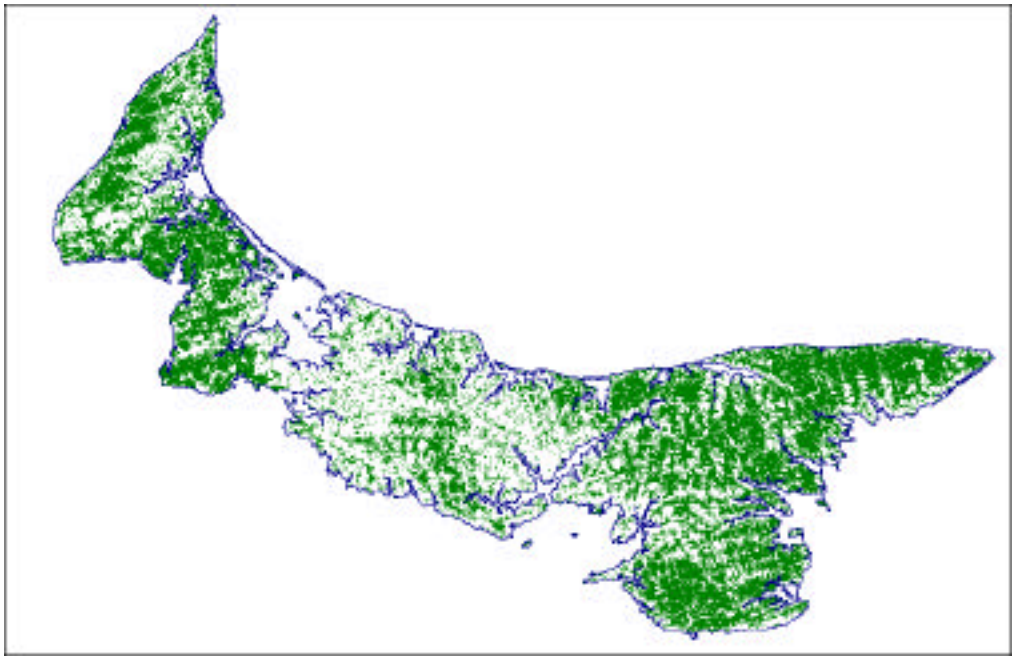


Figure 1: Forest cover (shaded) and cleared land on Prince Edward Island.

Potato production is the key problem crop as far as soil erosion and pesticide runoff is

concerned. In terms of total potato production, Prince Edward Island grows more acreage than either New Brunswick or Manitoba. Potato production has increased dramatically in the past decade with total acreage increasing from 65,000 acres in 1989 to nearly 120,000 acres in 1999. Water quality studies in the Wilmot River basin, which one of the most intensive potato growing area in the province, showed suspended sediment levels as high as 20,000 mg/l, with a multi-year average of 987 mg/l. Infilling of the fresh water and the estuarine portions of this system have been severe, with measured accumulation of sediment of over 2 meters in some areas. Fish habitat has been significantly impacted in many island streams and waterways due to sediment accumulation.

I should point out the agricultural activity is not the only source of eroded soil to impact on our waterways. Unpaved rural roads, highway construction and industrial and commercial development can also be significant contributors.

With the increase in potato production in recent years came a corresponding increase in the use of pesticides. Nearly a billion kilograms of pesticide active ingredient was used on Prince Edward Island in 1998. Growers generally apply pesticides 12 - 15 times per year. The annual treatments are comprised of 2-3 applications of insecticides, 7-10 applications of fungicides and 2-3 applications of herbicides. The issue of toxic land wash of surface water from treated fields has become a serious issue in the past five years, culminating in 8 major fish kills being investigated in 1999. Investigations have revealed that, to the best of our knowledge, the pesticides are being applied in accordance with label requirements.

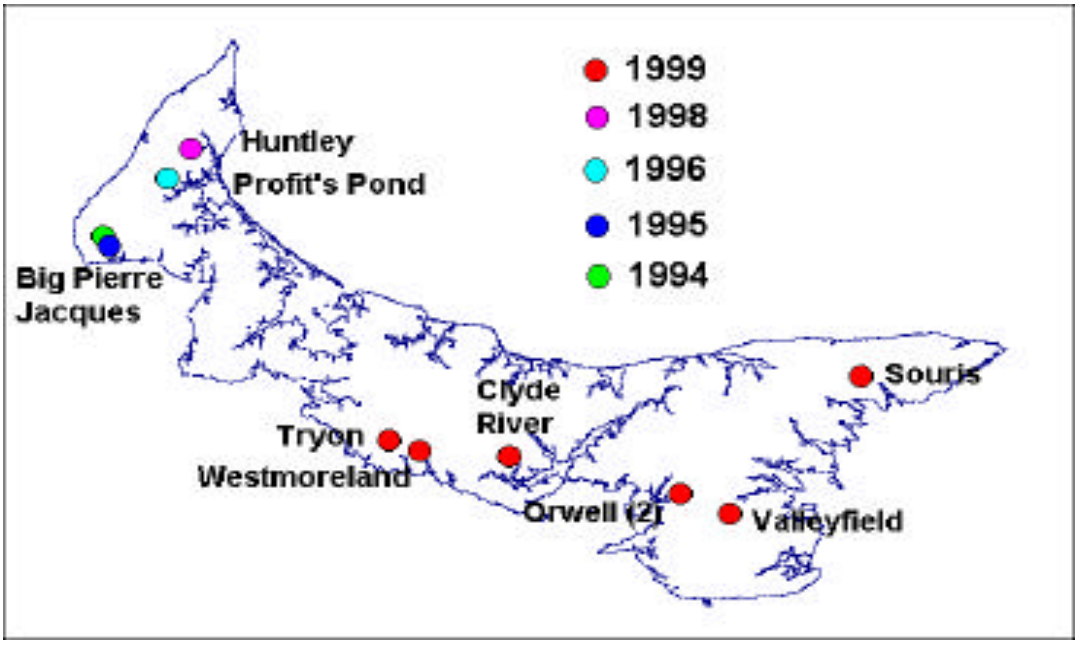


Figure 2: Locations of Fish Kills due to Pesticide Runoff.

In terms of nutrient enrichment of island waterways, studies over the past 30 years have shown a gradual increase in nitrate levels in both groundwater and surface water. The extent of that increase over time appears to be directly related to the proportion of the watershed that is in active agricultural use. The quality of surface water is directly influenced by the quality of groundwater, as base flow makes up about 65% of stream flow on an annual average.

Bacterial contamination of streams and estuaries due to surface water runoff from livestock operations and manure spreading is also an important issue on Prince Edward Island. The Island has some of the richest shellfish growing area in the world. Of the 85 shellfish harvesting closures in affect at the present time, a large percentage of those closures are influenced to some degree by the bacterial input from non-point agricultural sources.

Recognition of the Problem and Path toward Legislation

Recognition of the problem of soil erosion, waterway sedimentation and other associated impacts is not new on Prince Edward Island. The issue has been discussed for decades but seemingly

little concrete progress has been achieved. Soil and water conservation assistance programs in the early to mid eighties had limited uptake. In 1984, a Senate Standing Committee under the chairmanship of Senator Herbert Sparrow held nation wide hearings on the issue. In their final report entitled "Soil at Risk" it was concluded that soil erosion and soil degradation was a serious problem in all parts of Canada and that there was insufficient awareness of the existence and severity of the problem. The report went of to say that soil erosion could not be dealt with in isolation of such issues and water quality, land use, wildlife management, fisheries and forestry. Since that time there have been several other dissertations, including the 1987 and 1995 Environmental Conservation Strategies and the 1990 Royal Commission on the Land, that proclaimed the magnitude of the soil erosion problem.

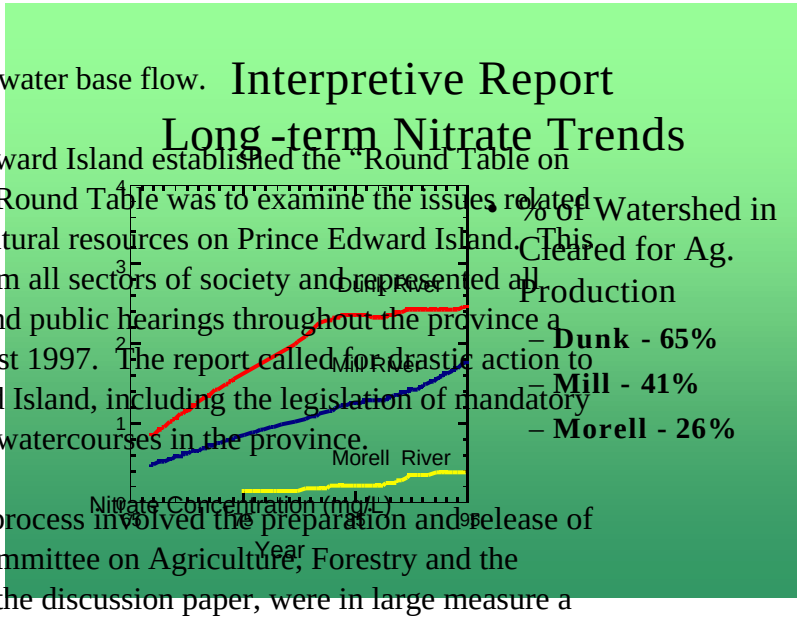


Figure 3: Nitrate concentrations in groundwater base flow.

In October of 1995, the Government of Prince Edward Island established the "Round Table on Land Use and Stewardship". The mandate of the Round Table was to examine the issues related to the sustainability of resource lands and other natural resources on Prince Edward Island. This 16 member panel was constituted by Islanders from all sectors of society and represented all major industries. After exhaustive consultations and public hearings throughout the province a final report was presented to government in August 1997. The report called for drastic action to address the soil and water issues on Prince Edward Island, including the legislation of mandatory 20 and 30 meter wide riparian buffer zones on all watercourses in the province.

The next step in the seemingly arduous approval process involved the preparation and release of a discussion paper by the Legislative Standing Committee on Agriculture, Forestry and the Environment. The proposed actions contained in the discussion paper, were in large measure a reflection of the recommendations of the Round Table. Again, extensive consultations took place culminating in a report to the legislature in April 1998. The riparian buffer zone legislation that would follow, save some last minute changes prior to approval, essentially reflected the recommendations of the Standing Committee report.

It is worth noting that, when the buffer zone legislation was finally approved, all the major farm organizations in the province supported the legislation. I often say when speaking to farm groups that we can all either take the credit or the blame depending on your perspective.

Riparian Buffer Zone Legislation

The requirement to establish and maintain watercourse riparian buffer zones on all forestry land came into effect in June 1999, while the requirements that apply to agricultural crop production, intensive livestock operations and land development came into effect on April 1, 2000.
The purpose of the riparian buffer zones is primarily to protect the province's surface water and wetland resources, as well as fish and wildlife habitat. Buffer zones serve to filter and assimilate contaminants from runoff water.

The establishment of buffer zones is a proactive approach to natural resources protection and is an integral part of the PEI Food Strategy. The sustainable use of our land and water resources is the under pinning of the Food Strategy.

Agricultural Crop Buffer Zones

A 10 meter wide buffer zone is now required on all agricultural land adjacent to watercourses.
Within the 10 meter buffer zone:

- no row crop production is permitted
- forage crops can be grown and harvested; the forage crop in the buffer zone can be renewed once every five years using spring tillage and an under seeded cereal crop
- the buffer zone can be used as a headland or turning area, but must have a forage cover.

Where row crops are grown, with rows running up and down the slope, the planting of a row crop in a headland adjacent to a buffer zone is not permitted. Individual rows should drain directly onto a grassed headland.

Where agricultural land within 50 meters of the upslope boundary of a buffer zone has slopes greater than 5 percent a soil conservation zone is required:

- fall tillage of land with a vegetated cover is not permitted within this 50 meters
- where the land has been planted in a row crop a winter cover must be established within this 50 meter either by
- the establishment of an effective winter cover crop or
- the application of a hay or straw mulch at a minimum rate of 1.5 tons per acre.

Livestock Operations

Buffer zones must be established and maintained between intensive livestock operations and all

watercourses and wetlands. New intensive livestock operations, including associated buildings, manure storage facilities, exercise yards and concentrated feeding areas cannot be constructed within 90 meters of a watercourse or wetland.

For existing operations:

- where the slope in the buffer zone is 9% or less the buffer zone shall be 20 meters in width
- where the slope in the buffer zone is greater than 9% the buffer zone shall be 30 meters in width
- Livestock waste or surface runoff from livestock operations shall not be discharged to any watercourse or wetland.
- Livestock waste or surface water containing livestock waste shall be contained in a water-tight holding facility.

The issue of exclusionary fencing of pastured livestock out of streams and riparian zones was the subject of great debate during the buffer zone legislation discussions. In the end, mandatory exclusion was not legislated. Instead of legislation the beef and dairy industry joined forces and developed a code of practice that calls for exclusionary fencing with alternate water systems. The code permits restricted access to streams for watering purposes only where other alternatives are not reasonably available.

The Department of Fisheries and Oceans is exerting extensive pressure on the industry to exclude livestock from any access to streams on the basis that bacteria, nutrients and sediment are or may be deleterious to fish and fish habitat.

Forestry Operations

Riparian buffer zones are now required on all forested areas that border on watercourses and wetlands. Forested Riparian Zones apply on all watercourses and wetlands except:

- Land locked Ponds
- Perimeter coastline
- Drainage ditches and intermittent streams
- No sediment bed and flow defining banks
- No flow July-October

The riparian buffer zone shall be 20 meters in width where the slope is 9% or less, and 30 meters where the slope is greater than 9%.

Within a forested riparian buffer zone no person shall:

- apply pesticides by the broadcast method
- construct road ditches or ditch run-outs within 15 meters of a watercourse
- operate heavy machinery within 10 meters of a watercourse or wetland
- cut or remove trees, other than through selection harvest, that represent more than 33% of the basal area (i.e. cross sectional area of live tress) in a 10 year period. Selection harvest allows for patch cuts of up to 0.5 acres, but that volume must be counted as part of the 33%.

Urban Development in Non-Agricultural and Non-Forested Area

A 10 meter riparian buffer zone must established and maintained in areas subject to residential, commercial, institutional, and recreational developments adjacent to watercourses. It should be noted that forested areas, regardless of intended use must preserve a 20 or 30 meter buffer zone depending on slope.

Funding Assistance – Bridging the Gap

In order to assist the industry too bridge the transition to the new legislation the Departments of Agriculture and Environment jointly sponsored a new program to help producers bring their operation into compliance with the new legislation. The program, called the Agriculture and Environment Resources Assistance (AERC) Program, provides up 66% funding assistance toward remedial measures directed at improving soil and water management on individual farms. A prerequisite to partake in this funding support is the completion of an environmental farm plan and a prioritized action plan to deal with compliance issues. The program supports such measures as soil erosion controls structures, strip cropping, modifications to intensive operations, manure and pesticide storage as well as riparian zone improvement and hedgerow planting.

Wildlife Habitat Improvement Programs

The Department of Fisheries, Aquaculture and Environment has had a wildlife habitat improvement program in place for a number of years. The program provides financial and technical support to watershed improvement groups across the Island. There are over 20 such community-based groups active in the province at the present time. The Department has just recently drafted a “Manual to Guide the Development of Watershed Management Plans”. A concerted effort is being made to encourage farmers and landowners to become actively involved in these watershed improvement groups.

Conclusion

In conclusion, I would like to emphasize that no-one in our province is under any delusion that riparian buffer zones alone will resolve all our problems with respect to the sustainability of our soil and water resources. We believe that riparian buffer zones are but one of several tools that must be used if we are to be successful in the coming years in reversing current trends toward soil and water degradation.

We are proud to say that Prince Edward Island is the first Province in Canada to introduce such comprehensive riparian buffer zone legislation. With the Island wide water quality network now in place we hope to be able to demonstrate improvements over time.

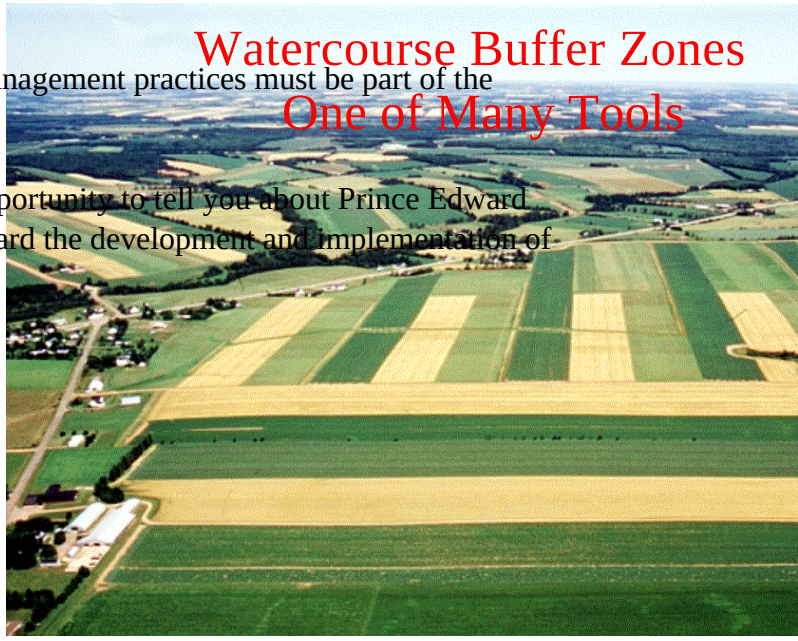


Figure 7: Improved soil conservation and land management practices must be part of the solution.

I would like thank you again for giving me the opportunity to tell you about Prince Edward Island's long and sometimes difficult journey toward the development and implementation of riparian buffer legislation.

3.4 EVALUATION OF BUFFER PROJECTS ALONG WATERCOURSES ON SOUTHERN ONTARIO FARMS

Nancy Tilt – Ontario Soil & Crop Improvement Association

I conducted this evaluation during October - November 1999. The projects I looked at were fragile agricultural land retired under Agriculture Canada's National Soil Conservation and Permanent Cover programs between 1991 and 1993, and, therefore, are 6 - 9 years old. The OSCIA administered the program and implemented it through local county associations. The buffer evaluation consisted of two parts: landowner interview and field evaluation

There were two types of projects:

- Demonstration projects, such as this 350 x 800 ft floodplain buffer near Ingersoll (Reynold's Creek is to the left), developed through co-ordinating agencies, such as C.A.'s, and eligible for up to a $20,000 financial incentive.
- Bid projects, such as this 20 ft strip buffer in eastern Ontario, developed by individual farmers and eligible for up to a $10,000 incentive. Participating landowners in both types of projects were required to sign a 15 yr agreement with Agriculture Canada to retire the land from production, as well as make a personal financial contribution.

A total of 1800 buffer projects, encompassing 8000 acres, are in place across Ontario. Last fall, I visited 40 sites across southern Ontario. The objectives of the evaluation were to look at the:

- effectiveness of buffers from a farm management viewpoint (15+15 ft strip buffer along a drain in Huron County),
- effectiveness of buffers in protecting the adjacent watercourse (20+20 ft strip buffer along a natural watercourse in Brant County)
- ecological development of the buffer, as in this 200 ft wide floodplain buffer in Simcoe County, which was also part of the Severn Sound Remedial Action Plan.

LANDOWNER INTERVIEWS

The landowner interview covered four main areas:

•

- establishment of the buffer
- suggestions for incentives
- maintenance
- landowner benefits

The main reasons for **establishing** the buffer were to:

- reduce streambank instability and minimize soil erosion (Brant Cty stream before buffer)
- to improve water quality
- to facilitate drainage ditch and tile outlet maintenance (15 + 15ft, drain in Essex County)
- to improve appearance, in some cases by adding trees to the landscape, (20+20 ft Brant County stream after buffer).

- Grass buffers were easily and quickly established. The biggest challenge proved to be in buffers where trees were planted. The greatest success generally occurred where professional advice and assistance were available to the landowner, as in demonstration projects with C.A.involvement. Hardwood tall stock generally had higher survival rates than evergreen seedlings, with grass competition being a major obstacle (20 ft treed buffer on one side of a drain in Waterloo).
- Wildlife shrub plantings generally did poorly, except for red osier dogwood, as in this 11 A floodplain buffer in Essex County.
- There was disappointment where tree planting efforts were unsuccessful as in this 10+10 ft strip buffer in Bruce County. Incidentally, the water quality and fisheries habitat in this old drain were among the best of all the projects I looked at.
- The level of **maintenance** ultimately depends on both the landowners' objectives and the day-to-day realities of managing the farm operation. Sixty per cent of the landowners carried out <u>low - medium maintenance.</u> In floodplain buffers, such as this 6 A. buffer in Middlesex County, maintenance involved mowing to control weeds.
- In strip buffers, (20 ft each side - Huron County) mowing occurred from one to three times during the season to control weeds, to provide travel access, and/or for a clean appearance.
- Fence maintenance, permanent and electric, also fell in the low-medium category. This 20 ft buffer along a drain was part of an intensive rotation sheep grazing operation in Dufferin County. The electric fence is at the top edge of the ditch. Intensive grazing occurred on this buffer twice for 1-2 days over the course of the season.
- <u>High maintenance</u> occurred on two properties. One is a plantation of hardwood trees that the

landowner, a crusty 77 year old war veteran, looks after attentively - mowing around, pruning and transplanting as required to maximize survival.

- The other is a 30 ft buffer mowed on a weekly basis and maintained as a lawn. A row of red-osier dogwood planted at the field edge marks the edge of the buffer and is now providing songbird habitat. This buffer receives frequent compliments from area landowners.
- Thirty-five per cent of landowners carried out no maintenance (15+10 strip buffer - Perth County). Reasons for "letting the buffer grow" included lack of time to keep it mowed (although weeds were an issue the first 2-3 years for some landowners), not easily accessible, either by distance from farm buildings or fencing to exclude livestock, or wanting a more natural appearance.
- In buffers with no maintenance, a diversity of vegetative structure is developing with grasses, forbs, and some shrubs along with the planted trees. The height of the trees is about 15 feet for hardwood tall stock and 6-8 ft for evergreen seedlings. Some of the buffers had shrubs and mature trees in or adjacent to them (floodplain buffer along Kettle Creek - Middlesex County) that were there prior to buffer establishment, adding to those buffers' diversity and maturity. These sites were further advanced ecologically than any of the mowed sites.
- Farmers identified several **benefits** from establishing buffers on their properties, including:
  - Improved aesthetics with improved bank stability, less sediment in the watercourse, and in some buffers, the presence of trees (20+10 ft buffer along a drain in Waterloo County).
  - Buffers also helped to increase drain life and reduce drain maintenance, provided a safety zone to keep heavy machinery away from the edge of the ditch, and allowed access to other parts of the farm as travel lanes (30 ft buffer in Essex County).
  - Fencing cattle away from the stream and providing water via nose pumps resulted in an improved water source (Carp River - near Ottawa).
  - Several landowners mentioned the benefit of recreation, even as a place just to go and think, and the benefit of improved fish and wildlife habitat. Of the 40 farmers I interviewed, trespass was a very minor issue.
  - And last, but not least, the satisfaction of good stewardship. Most indicated that the benefits outweighed the costs, and that the buffers have become an integral part of the farm operation (floodplain buffer along Hog Creek - Simcoe).
- When it comes to **incentives** for encouraging others to establish buffers, education and "preaching" about the importance of soil conservation and water quality protection were viewed as essential, recognizing that it will take time to reach the majority (10 A floodplain buffer on Penetangore River - Bruce). Only two landowners suggested legislation for the establishment of buffers and one for keeping livestock out of watercourses. A fourth

suggested legislation be in place, but used only as a last resort.

- **So, how do you get a landowner to take that first step** (Webfoot Farms - Wellington County, before)? The financial incentive was regarded as very important initially in encouraging landowners to establish buffers; 75% of participants in the program wouldn't have done so without it.
- Existing demonstration sites were considered an important incentive (Webfoot Farms - after; 20+20 ft). Several farmers felt that good, hard statistics on the benefits vs.costs of establishing buffers would go a long way in selling them. Almost 90% of the farmers had no concerns with the Agriculture Canada agreement they signed to retire land from production.

FIELD EVALUATIONS - WATERCOURSE AND BUFFER

The assessment of the **buffer**, itself, measured its current dimensions in relation to the original proposal, and noted species and height of trees - planted and existing - as well as herbaceous and woody vegetation. It is noteworthy that all buffers are still in place with the majority unchanged. The **watercourse** was assessed using the USDA Stream Assessment Visual Protocol, which scores several physical conditions affecting the health of the watercourse. Scores were generally lower for sites along drains and higher for those along natural watercourses as would be expected. These are well documented in the report, so I won't spend time on them here, except for the criterion that deals with riparian zones. This criterion measures the extent of natural vegetation in terms of active channel widths on each side of the watercourse. Natural vegetation is defined as consisting of all the structural components (aquatic plants, sedges or rushes, grasses, forbs, understorey trees and overstorey trees) appropriate for the area. Active channel width is the stream width at bankfull discharge.

While many of the newly established buffer sites met the criteria for width of vegetation on each side of the watercourse (30 ft strip buffer along a drain in Haldimand-Norfolk), none met the definition of natural vegetation. This is due to either that there hasn't been enough time for the structural components appropriate for the area to develop or because of maintenance on the site in terms of its desired function.

- The maturing sites will meet this criterion in time, but for now they were given a score in the mid-range of the evaluation.
- Buffers along drains that are planted to grass and mowed will always score low.
- Those with trees on one side and grass on the other, to facilitate drain maintenance, will always score in the mid-range (Waterloo - 20+10 ft). I need to add a comment here about the USDA Protocol scoring as it relates to the buffer projects. Because only one of the criterion deals with the riparian zone, the resulting scores should not be considered as a measure of the

success of the buffer establishment program, especially if it leads to a landowner feeling that his/her project is unsuccessful.

- The USDA Protocol is most effective when field observations on a particular stretch of stream can be compared with an existing reference site for the same ecoregion and drainage area. Reference sites represent the best conditions attainable within a particular stream class. Unfortunately, no such reference sites in Ontario were available for this assessment.

Some Design Suggestions

- Buffers adjacent to livestock pastures should cover the riparian zone, or a good portion of it. Ten feet, as in this case, is not enough. Manure from livestock may enter the water from run-off of grazing land adjacent to the stream. The narrower the buffer next to livestock pastures and/or the greater the number of cattle, the more vigilant fence maintenance needs to be. It doesn't take cattle long to trample streambanks, if they break through the fences. Permanent fencing needs to be placed outside the floodplain.
- Nose pumps as a water source for livestock are preferable to controlled access.
- However, complete restriction may not always be feasible, and there is a need for improved livestock crossing/access designs in such cases (floodplain - Simcoe).
- The larger the river, the wider the buffer should be. Ideally the buffer should extend to the high water mark. In areas of flat land and extensive flooding, this obviously wouldn't be practical. Ecologically speaking, more would be better than less, although many farmers would not agree with this from a farm management perspective. In areas of more varied topography, the buffer wouldn't need to be as wide. Sites on high gradient rivers should be sited appropriately, otherwise they're susceptible to washout. Again, more would be better than less (strip buffer along stream - Simcoe County).
- Strip buffers of uniform width are appropriate along straight agricultural drains with high banks designed to carry all flood waters (8 ft deep drain - Perth). Where watercourses, drains or streams, overflow, the buffer should approximate the boundary of the riparian zone.

SUMMARY

- All landowners interviewed acknowledged the importance of soil conservation and maintenance of good water quality. This commitment on the part of the farmer was the main factor in the success of establishing the buffers. At the very least, the farmer has to see the benefit to the farm operation before he/she is receptive to these types of projects. Individual flexibility in terms of buffer management is very important. There is a wide range in landowner perception of how the buffer should look and how it fits into the management of

the farm operation.

- Some see it as a utilitarian, functional feature to be used on a regular basis, such as for travel access, rotational grazing or hay production.
- Others see it as an investment in environmental protection as in this floodplain buffer along the Ruscom River in Essex County, because it has more value in that form than it did in agricultural production. As this farmer said, “My floodplain land wasn’t meant to be farmed. I’m putting it back where it belongs.”

Whatever the manner of implementation, the outcome is similar - a change in land use that results in steps towards the ultimate objectives of soil conservation and maintenance of good water quality.

3.5 "BUFFER STRIPS…MAKING THEM WORK"

Mike McMorris, Assistant Manager – Ontario Cattlemen's Association

Agricultural Production and Buffer Strips

Any efforts must involve landowners as they control the resource

- Beef production in Ontario
  - 67,000 producers and 14 million acres
  - 24,000 farms
- cows make efficient use of poor resources
- very low profit margins
- benefits must be obvious

Society's Changing Expectations

-
  - Environment
  - Water
  - Greenhouse gas
  - Endangered species
  - Nutrient management
  - Quality control
  - Food safety / AMR

Akin to a smoking ban …. in your own home!

OCA Activities to date

-
  - Environmental Stewardship Award
  - Ontario Farm Environmental Coalition
  - Environmental Farm Plan
    - 18,000 to date
    - about 5,000 beef
    - 5 million acres
    - $197 million in projects
  - Demonstration projects
  - Water Guide
  - Research
    - Quantify impact of cattle access, scenarios warranting exclusion and intermediate actions that are cost effective

What next?
Need to find the middle ground with effective and realistic solutions

New Initiative
- Develop Best Management Practices for *Buffer Strips on Farms*
- Education program for landowners, regulators, other interested parties

Partners
•

- OCA / CCA
- Dairy Farmers of Ontario
- OSCIA
- OMAFRA / MOE MNR
- Department of Fisheries and Oceans
- Environment Canada
- Wildlife Habitat Canada
- Ducks Unlimited
- GRCA

Making it Work Requires:
•

- a level of trust
- a healthy dose of reality
- mutual benefits
- that those involved be well intentioned and well informed

- COMMUNICATION

3.6 PROGRAM IDEAS FOR ONTARIO

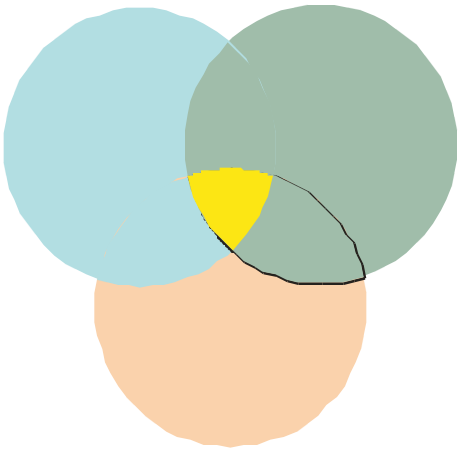
Tracey Ryan, GRCA and Andy Graham, OSCIA

Buffer Functions

- Soil conservation
- Water quality protection
- Wildlife habitat
- Carbon sequestration - Air quality
- Reduced drain maintenance
- Landscape diversity
- Nutrient management
- Generating income

Competing interests

- Society's" desire for clean air, clean water, wildlife habitat
- "Environmentalist's" concerns for habitat diversity, endangered species, native species
- "Farmer's" need to run an effective business and make a living



Communities of Interest

- Farm Groups
- Wildlife Groups and Organizations
- Conservation Authorities
- Provincial Agencies
- Federal Agencies
- Community Groups

FINDING COMMON GROUND
Barriers

- Fragmentation and competition between groups
- Buffers are not a priority for farmers - wildlife habitat is not a priority

- Financial barriers are the # 1 reason for farmers not taking action

Opportunities

- Increasing interest in buffers
- Potential to initiate a larger effort based on the communities of interest
- Recognize that what is good for soil conservation is generally good for water quality and wildlife

The Vision

- Recognize the Goals, Values and Priorities of Landowners

- Accommodate Multi-Purpose Buffers

- An EFP deemed appropriate must be one eligibility criteria
- Participants must agree to sign a15-year Conservation Agreement

- Program delivery by a farm group and planting plan assistance through agencies

INVESTING IN ENVIRONEMNTALL VITALITY
10,000 acres of buffers for $15 million

4.0 BREAKOUT GROUP SUMMARIES

The approximately 150 participants were broken into 9 groups, each with a facilitator and recorder. The breakout sessions focused on the questions listed below. To quote Albert Einstein,

"We cannot solve today's problems with the same level of thinking that created them."

What do we need to better manage riparian zone buffers in Ontario?

- Define needs or desired functions, types of needs and priorities.
- Are there principles to follow in order to address these needs?
- What are the obstacles or impediments to achieve the development of riparian buffers?
- What processes and tools do we need?

What should be the next steps?

-

- Who is the audience for the information?
- Who should take leadership?
- Who should be involved?
- Who should get this information?

All the information and ideas generated by all discussion groups were reviewed and synthesized into a set of major themes. Although the major focus of this workshop was riparian buffer management in Rural lands of Ontario, there was some discussion on the differences of approach that should be considered if developing a riparian/buffer program in urban landscapes.

THEME 1:PRESENT VIEWS ON RIPARIAN/BUFFER STATUS

Perhaps the most typical statement made about the status of riparian/buffer management in Ontario at present is that information and programs are piecemeal. Information is scattered in various agencies and universities and amongst many different practitioners and scientists (of different disciplines).

Buffer-type programs that have been available tend to lack a strong direction or articulated purpose and exhibit a structure that is not easily transferred from the program area or geographic location for which it was developed to other areas. This lack of direction leaves the impression that the various approaches for buffer management and riparian zone protection and restoration are fragmented at best.

Despite these negative comments, adoption of buffers is on the increase (though slow). There are now more riparian buffers than there were 10 years ago. Participants believe that we all need to continue to sell the merits of riparian buffers to landowners, farmers, planners and politicians. If this is done, the process of buffer creation will continue. However, one of the biggest questions still remains – will the adoption level satisfy the needs, wants and demands of the general public?

THEME 2:VIEWS ON LEGISLATION

Amongst the majority of the participants, a strong opinion was voiced: "We don't need regulation, we need incentives". Legislation was not viewed as bad or irrelevant since it does state the overall view of society and its desires to ensure a certain standard of behaviour or action. It was felt by most that legislation is often required to deal with the "bad apples". However, many comments inferred that legislation can be very restrictive and often presents the problem of enforcement.

Legislation creates regulations that tend to assume or promote the principle that, "One size fits all". However in natural systems, local conditions can vary widely and the regulations arising from legislation often do not allow the flexibility necessary to achieve the best balance between personal interests and a healthy environment.

When dealing only with a legislative approach, the minimum standards imposed will cumulatively not achieve the best balance possible but rather minimum benefits and minimal environmental quality. Conservation objectives in the agricultural community are very difficult to achieve with regulation.

The challenge is to ensure that current legislation is clearly defined and proactive to promote education and then to develop programs that encourage a proactive approach that strives for excellence. This is where incentives come into play. Regulation may have merit but we can't apply the same buffer design principles to each and every situation. A regulatory approach is based on a contrived figure where voluntary implementation allows more creativity depending on objective. A voluntary approach has much more potential.

Many of the participants in the breakout sessions firmly believe that government and private sector funds can be better spent for proactive activities rather than legislation. Use legislation as a back up or last resort, not your major tool for managing for environmental quality and health.

In conclusion, many participants felt that a voluntary approach might be a best approach until such time as the agricultural community develops a broader acceptance of buffers. Then regulations could be enacted to deal primarily with the bad players. This approach could be different in urban and urbanizing communities where the community may demand the use of buffers to protect important environmental features. Unlike farmers, developers can pass on the cost of regulation to the consumer and therefore, there may be a greater acceptance of buffers in urban landscapes than in the rural landscape.

THEME 3: BARRIERS TO IMPLEMENTATION

Barriers to implementation can be categorized into several areas: political will (urban vs rural); governance; technical knowledge; incentives; landowner perceptions; and funding and management.

At a broad perspective, most participants felt that the greatest barrier to implementing a riparian/buffer program in rural Ontario was political will. There are very strong opinions regarding the rights of society for security of resources and the rights of landowners to manage land for their own benefits. This is especially the situation in Southern Ontario where the majority of land is privately owned, even though water quantity and quality, fish and wildlife are a public responsibility. Political will is tempered by public sentiment. Many felt that in rural areas, the demonstration site approach eventually builds support that is

then reflected in the Political will to act.

In Urban Ontario, there appears to be an emerging realization by planners in municipalities that the historical buffers in some cases may have not been effective. Some participants felt that it would be easier to establish buffer programs in urban municipalities than in rural areas through the Official Planning Process although some stated that Official Plans appear to have "no teeth". One participant suggested using the terminology and program developed by the USEPA called "SMART" development. Some of the developments used this approach, cluster home development was used with buffers established to protect the stream. In many cases, the buffers and the amenities created by the buffers, made the homes more valuable on the market.

One difficulty could be the variable minimum widths for buffers identified in the various Provincial Policy statements. Developers of land in urban landscapes feel that the more land they have to "give up" for riparian buffers equates to less lots and less profit for them. Short-term profitability concerns for the developer often overshadows the creation of long-term maintenance and environmental costs to the municipality.

When it comes to riparian buffer management, governance is weak. There is a lack of a coordinated Provincial umbrella to co-ordinate the establishment and maintenance of riparian buffers. No one Provincial agency has the mandate to manage, protect or restore riparian buffers. Clouding the issue in southern Ontario is the question of how do you resolve issues around public vs. private property rights and responsibilities. The landowner may own the land, but what occurs on the land may affect a public resource – water.

Further exacerbating the issue of governance is the management question of consistancy of approach. Do we develop the same approaches for management of riparian buffers in rural areas as we do in urban areas? Participants at the workshop felt that different approaches may have to be developed, but any approach will require clear goals, objectives and implementation methods. Presently, the bulk of the work is done locally with little overall direction or broader goals attached to it.

In many cases, Provincial programs and agencies can also create barriers for the maintenance and protection of healthy riparian buffers. For example, the Provincial Drainage Act allows landowners to create and maintain drainage works on agricultural lands for the benefits of all local landowners. There are no strong provisions in this act for the protection, management or replacement of riparian buffers after drainage or maintenance occurs. Therefore on one hand we are beginning to encourage farmers and other rural landowners to create and maintain riparian buffers along their watercourses and wetlands, while having legislation that often works contrary to this.

Knowledge and understanding of riparian zone structure and function and the transfer of this knowledge to society also limits our ability to manage these systems. Most landowners within a rural or urban community are unaware of the functions provided by healthy riparian zones and buffers. Lack of knowledge can also lead to certain landowner perceptions about riparian buffers (e.g. I won't be able to see the stream; these places are refuges for weeds; they look unkempt; weeds from these zones will encroach on my property; this buffer will reduce my property value). As mentioned before, demonstration projects can help

to change perception, however this method of education can take a long time to develop concensus.

Even when a landowner or municipality decides to establish a buffer within a riparian area in order to protect specific functions, there is no information on the widths, lengths and structural requirements that must be designed to achieve the functions desired.

How does society fund a riparian/buffer program? Should government at one, some or all levels provide funds and incentives? What should be the role of the private sector in supporting and/or sponsoring riparian/buffer initiatives? Lack of dedicated programs or funds for riparian buffer management is certainly a barrier to implementation. In rural areas, there are presently little or no incentives directed for establishment of riparian buffers. These incentives could partially defray the cost to landowners of installing buffers and the time involved in maintenance of the buffers. Many incentives for other rural programs tend to focus on the farmer, whereas, in the case of riparian buffers, all rural landowners should be targeted as well. In the case of urban or urbanizing municipalities, breakout groups suggested that developers pay a riparian tax regardless of whether there is riparian in their development or not. These funds would go to a general riparian/buffer pot that would be used to establish buffers where appropriate, purchase easements and maintain existing buffers.

One of the more generic barriers that any new science/technically based initiative will have to contend with is the lack of monitoring support. In an ideal society, we can learn by doing. We often do not have the time or luxury to gather all scientific information prior to initiating a program, rather, we develop a program with goals, objectives and the best technical information at hand and hope that we learn by monitoring the success of our initiatives. Unfortunately, in most initiatives, funds are not provided for monitoring or to learn through the collection of long-term field data.

THEME 4: DEVELOPMENT OF A RIPARIAN BUFFER PROGRAM FOR ONTARIO

The breakout groups spent the most time discussing the elements needed in order to create a riparian/buffer program in Ontario. The elements are summarized below as: guiding principles; factors to consider in program design; background information and research; program delivery considerations; incentives; use of demonstration sites; funding and project leads; marketing approaches; landowner considerations; and an example of a program approach.

Guiding Principles and Objectives

A set of guiding principles should facilitate the development of a program with clear goals and objectives.

- Develop a strategic plan (this plan should include, structure, identification of stakeholders, visions, mission statement, specific goals, objectives, implementation strategies, monitoring, etc);
- The Strategic Plan should be inclusive to all rural landowners but also consider both rural and urban;
- Any program and supporting strategic plan must support current farm initiatives and build on them (i.e. Environmental Farm Plan);
- Need an integrated approach that encompasses many aspects of water management
- Riparian buffers are only part of the package – best combined with upslope management practices.
- Encourage the creation of community-based management associations, perhaps established on a sub-watershed level to deal with the protection, management and establishment of riparian buffers.
- Rather than only spending money to clean up, also spend it on prevention. (e.g. rural communities provide cheaper food to urban areas, urban communities may be convinced to contribute to improving

rural upstream conditions of water quality. Urban river rehabilitation = $1000/m. Cost of prevention upstream may be cheaper than focussing clean-up funds only in urban areas – part of the rationale for the original Region of Waterloo Rural Water Quality Program)
- Other interests and users of land must be brought into the process (e.g. develop process/tools for groups such as MFTIP i.e. golf courses, recreation trails and parks, CA's).

Factors To Consider in Program Design
A number of factors must be taken into consideration by any organization, committee or agency that wishes to develop a riparian/buffer program for Ontario. Below are a series of points that provide recommendations on vision and goal setting, program development criteria, important linkages, partners, participants and caveats.

Vision and Goal Setting
- *Set goals based on sound science, tempered with landowner needs/concerns and societal issues/needs/goals;*
- *Needs to include: Importance of water quality, ecological benefits, gains so far, tangible results;*
- *Vision should embrace all riparian areas not just rural but also urban;*
- *Consider building a program around an adaptive resource management model;*
- *Find a common goal and transmit awareness to whole community;*
- *Determine common ground between landowners, community, societal interests.*

Program Development Criteria
- *Make program development an iterative process with phasing - adaptable as values/science change;*
- *ID provincial needs - ID stakeholders - Establish goal – Educate - Develop BMP's*
- *Don't sell program on benefits to wildlife;*
- *Need to ensure buffers required are flexible (this may require criteria for specific functions to be protected under specific circumstances – soil, topography; land management system, etc.);*
- *Do what you can with what you have – set achievable goals;*
- *Must define how success is to be measured – water quality, wildlife habitat, soil conservation*
- *Riparian zones are often the most productive part of the farm – need to find ways to use them productively in an environmentally sound manner – convert vs. retire (i.e. are there farm practices that are compatible to some of the desired functions of riparian buffers?);*

Important Linkages/Considerations
- *Issue of hypocrisy around targeting farmers vs. other industries like golf and septic (we must be inclusive);*
- *Remember to be fair - Urban contribution re lawns spraying of fertilizer/pesticides/herbicides must get equitable treatment;*
- *Remember that farm buffers are not necessarily permanent and may change over time;*
- *Voluntary approaches can provide more flexibility – farmers can be more generous and in some cases will give you more than a required minimum. Rivers are never straight – encourage farmer to make straight fences – wide/narrow buffers –less maintenance, straightened fields – benefits to farmer;*
- *US program had no account for function/diversity – let's learn from this to make a better program;*
- *Do we need taxation change to assist with protection or establishment of riparian buffers.*

Partners and Participation

- *Develop partnerships with other large scale landowners (e.g. golf courses and farm groups);*
- *Bring the right people to the table and find out who is doing what. We are missing developers, homebuilders, consultants, landowners, planners, municipalities, OMB, golf courses. Get cottagers associations involved. Remember farmers aren't the bad guy – highways, roads, lawns/pesticides*
- *Outline the things that bind us not separate us.*

Background Information and Research

Background information should be collected in order to scope the issues, concerns and constraints of the landowners as well as the key functions that society wishes to achieve through the use of riparian buffers. Listed below are a small set of ideas on background information requirements in support of program development:

- *Identify and work towards integrating constraints and objectives of landowners;*
- *Summarize – inventory of previous/current programs – what has and has not worked – and money involved;*
- *Synthesis – find out what exists now – don't reinvent the wheel;*
- *Determine how other countries finance these programs – are there other models to follow*
- *Biggest question is how wide (requires synthesis of width/length vs function/site conditions);*

HOW DO YOU SUBSIDIZE - BASED ON SIZE OR FUNCTION?;

MAKE A LIST OF AGENCIES/GROUPS TO HELP FARMERS/CAS ACCESS FUNDS FOR PROJECTS;

- ***NEED TO ID PROJECTS THAT WILL GIVE YOU THE BIGGEST BANG FOR THE BUCK;***
- ***NEED TO EXPLORE BMPS AND BUFFERS ON OTHER LAND USES I.E. URBAN, RURAL NON-FARM AND RECREATION***
- ***RESEARCH NOT ALWAYS AVAILABLE OR NEEDED BEFORE HAND THEREFORE KEEP RECORDS AND PHOTOS. PERHAPS MONITORING INFORMATION CAN BE USED AS A BASELINE TO MEASURE ANY IMPROVEMENTS (E.G. DO, SEDIMENTS, NUTRIENTS, BANK STABILITY, DRAIN MAINTENANCE PERIOD; ETC.).***

PROGRAM DELIVERY

THE BEST DEVELOPED PROGRAMS CAN OFTEN FAIL IF THE DELIVERY MECHANISMS AND PROCESSES ARE NOT IN PLACE. GIVEN THE COMPLEXITY OF CONSIDERATIONS THAT MUST BE ADDRESSED IN A RIPARIAN BUFFER PROGRAM (I.E. URBAN VS RURAL; DIFFERING SITE CONDITIONS; VARIOUS LAND MANAGEMENT SYSTEMS; DIFFERENT FUNCTIONS WITH DIFFERENT REQUIREMENTS; NEED FOR INCLUSION OF ALL OWNERS OF RIPARIAN LANDS, ETC.), DELIVERY MECHANISMS MUST BE WELL THOUGHT OUT. SUMMARIZED BELOW ARE SOME OF THE MAJOR IDEAS ON PROGRAM DELIVERY (FOCUSED MOSTLY ON RURAL LANDS):

- *THE PROGRAM WILL NEED A GUIDING PROVINCIAL STRATEGY – BUT WE MUST REMEMBER THAT DELIVERY WILL BE AT THE LOCAL LEVEL (E.G. PROVINCE WIDE PROGRAM LIKE EFP WITH LOCAL DELIVERY TO MEET LOCAL NEEDS);*
- *IN RURAL AREAS, MAKE IT SIMPLE – FOR MANY PROGRAMS, LANDOWNERS NEED A BROKER TO HELP GET FUNDING;*

IN RURAL AREAS, THE PROGRAM SHOULD ENCOURAGE FARMERS AND RURAL LANDOWNERS TO APPLY THROUGH THE EFP (ENVIRONMENTAL FARM PLAN) BECAUSE OF ITS' REPUTATION, INTEGRATION AND ESTABLISHED DELIVERY MECHANISM;

- ***PROGRAM MUST BE ACCOUNTABLE EVEN THOUGH IT WILL LIKELY BE DELIVERED BY THE LOCAL PEOPLE;***
- ***IN RURAL AREAS, AGENCIES/DELIVERY ORGANIZATION MUST MAKE TIME FOR ONE ON ONE CONTACT WITH LANDOWNERS;***

- ***PROGRAM NEEDS CONSISTENCY AND ACCESS TO PROGRAM SHOULD BE EASY I.E. PAPERWORK;***
- ***ID ALL STAKEHOLDERS AND INVOLVE THEM IN DELIVERY. PARTNERSHIPS ARE REQUIRED – AGRICULTURE AND CAS***
- ***NEED INTEGRATION WITH EXISTING PROGRAMS – COMBINE FUNDING SOURCES;***
- ***UPTAKE OF BMP'S FOR RIPARIAN BUFFERS WILL REQUIRE A VIGOROUS EXTENSION PROGRAM AND REASONABLE FUNDING;***
- ***NEED A UNIFIED AGENCY TO DELIVER TO ADMINISTER TO REDUCE DUPLICATION AND EFFICIENCY.***

INCENTIVES

Incentives can be tangible (e.g. funds to install and maintain buffers; lower operating costs; water quality improvement, reduced property losses) and intangible (e.g. improved view; wildlife viewing; more fish in the stream, etc.). Financial incentives are obvious, but many of the intangible benefits only become obvious after review of well established riparian buffers and discussions with participating landowners (see OSCIA presentation by N. Tilt in these proceedings).

- Must work with landowner to provide both short and (where appropriate) long term incentives (e.g. money to implement and then long-term support for maintenance);
- Recognize other income such as 'renting' stream to fishermen, riparian woodlot management, hunting opportunities, etc.;
- Identify other economic benefits that may occur to landowners by the establishment of riparian buffers. These can be considered non-monetary incentives (socio-economic research need);
- Need to identify direct and indirect economic benefits to landowners.

Demonstration Sites

In rural areas, demonstration sites are still believed to be one of the best educational tools available. The use of regional and local demonstration sites provides local farmers with an example of how the initiative may look and work on their property under local conditions. With this in mind, there were several suggestions on the continuing use of demonstration sites by the breakout groups.

- We need more and existing ones should be tracked in order to continue promoting their success;
- Develop regional demonstration sites so less travel for landowners to view the sites. In this way potential subscribers can see local differences, likely trust local farmers and therefore make the program believable;
- Ensure good signage to invoke pride.

Project Leads/ Funding

Government cannot do it all, nor should they. That was a clear statement from the breakout sessions. However, government must be involved with partners and provide assistance and support for initiatives such as riparian buffers. Opinion as to who should lead a riparian buffer initiative varied. Some felt that it was very important that the Province lead AND support the initiative, whereas others felt it would be a strong process (in rural Ontario) if the farmers and rural landowners lead the initiative with Provincial support. One other suggestion was to have the initiative lead by groups such as the Ontario Stewardship Councils with support from governments, farmers, and other agencies. There was no doubt however, that the Provincial government has to be involved either in a supporting or leadership role in this initiative.

There was also no doubt that any initiative must be built on multi-sector, multi-interest partnerships. In rural areas, many farmers felt that the initiative should be farmer driven but also more inclusive with other

interests (e.g. Ducks Unlimited, World Wildlife Fund, Trout Unlimited, etc). One suggestion was to ensure political support to create a provincial umbrella group dedicated to pulling together all interest groups and communities in order to provide a unified voice to ensure government support.

One of the major roles of government, both Provincial and Federal was seen to be the provision of funds to initiate and maintain a core to any major project. However, additional funds must be sought from other partners (profit and non-profit groups). It was felt that since society as well as the local landowner will benefit from riparian buffers, society through tax dollars should also contribute. This thinking, in part, was one of the reasons that the Region of Waterloo, in conjunction with the Grand River Conservation Authority and local farm organizations initiated the Rural Water Quality Program several years ago.

Leadership in government often comes through following what society determines to be a major issue. There were a variety of suggestions by participants on how to get politicians and government to embrace riparian buffers as a program. Some at the workshop felt that the Ontario Environmental Farm Coalition and/or the Environmental Farm Plan (specifically) could be the vehicles to get Provincial support for a program.

Here are the major comments, opinions expressed on this subject:

- Province take leadership
- Don't look to the government for a lead – farmers take the lead and get government support
- Needs to be a private/public initiative (partnership) of profit and non-profit groups.

RIPARIAN MOVEMENT NEEDS TO GET OTHER ORGANIZATIONS WWF, DU TO HELP PROVIDE SUPPORT FOR THE IMPORTANCE OF RIPARIAN ZONE MANAGEMENT OR ENHANCEMENT

- ***GOVERNMENT PROVIDES INITIAL DOLLARS AND INDUSTRY/PRIVATE COMPANIES FURTHER THE PROGRAM***
- ***$$ CONTRIBUTION FROM SOCIETY IS A CRITICAL ELEMENT***
- ***NEED FUNDS AND LONG TERM COMMITMENT - NEED PROVINCIAL $ TO MEET AND TO PROMOTE/SELL SOCIETY BENEFITS TO ALL***

- ***CERTIFICATION PROGRAM I.E. GREEN GOLF COURSES. A CHEMICAL COMPANY GOT INVOLVED BECAUSE THEY FEAR REGULATION AND THEREFORE SUPPORT VOLUNTARY PROGRAMS AND THEREFORE PROVIDE FINANCIAL SUPPORT. A LOT OF FUNDING IS COMING FROM URBAN AREAS, HOWEVER THESE SOURCES NEED TO BE ORGANIZED.***
- ***FORM A COALITION OR SOCIETY TO LOBBY FOR MONEY/SUPPORT AND EDUCATION – I.E. ONTARIO FARM ENVIRONMENTAL COALITION MIGHT BE APPROPRIATE BUT DOES THIS EXCLUDE URBAN AREAS***
- ***GET INVOLVEMENT FROM COMMUNITY GROUPS – FORCE POLITICAL HAND TO COUGH UP $$$***

MARKETING APPROACH

MARKETING AN IDEA HAS MANY FACETS. AT THE SIMPLEST, MARKETING ATTEMPTS TO SELL AN IDEA AND A DESIRE BY THE TARGET AUDIENCE TO BE ASSOCIATED WITH THE PRODUCT OR ACTUALLY OWN IT. THEREFORE AT ONE LEVEL, MARKETING SHOULD INCLUDE A BACKGROUND EDUCATIONAL COMPONENT, BUT AT ITS MOST PERSUASIVE MUST ANSWER THE QUESTIONS, "WHAT'S IN IT FOR ME….WHAT DO I GET?"

IN ORDER TO ACHIEVE A GOOD MARKETING APPROACH, BACKGROUND INFORMATION IS NEEDED ON THE TARGET AUDIENCE, THEIR DEMOGRAPHICS, NEEDS, DESIRES AND WANTS. WITH THIS INFORMATION, EDUCATIONAL AND PROMOTIONAL MATERIAL

can be created that provide general and specific answers the questions and needs of the target group. Good information and understanding of landowner concerns will either make or break the program.

Any socio-economic market research must begin by determining what the landowners (e.g. farmers) want and what they are willing to consider. Some ideas on farmer interests are detailed in Steve Davis' presentation. We must recognize that people are different with different motivations and that in any potential program, economic viability must be included for all stakeholders. Other than general studies, one of the best tools for assisting landowners to assess/identify their own needs is the Environmental Farm/Home Plan.

There is no doubt, based on discussions in the breakout sessions that rural landowners and farmers specifically would prefer a program that is based on education and voluntary action (with assistance through incentives) than to go the legislative way that PEI and British Columbia have gone.

Below are some of the highlights from the breakout groups relating to marketing:

- *Should be marketed to gain trust and respect. Preferred approach – EDUCATION*
- *Identify motives of target audiences – recognition, pride, peer pressure, money*
- *Public communication/education to get public buy-in and value shift*
- *Awareness that riparian zones must be protected*
- *Information out to farm groups, other non agricultural environmental groups, wildlife service*
- *Landowners prefer education to legislation especially with incentives.*
- *Sell to farmers on premise that:*
  - *Practicing due diligence*
- *Reduces liability regarding streambank stabilization.*
- *Reduced channel maintenance costs*
  - *Quality of water for their own livestock and downstream neighbors as well as recreation opportunities – fishing, wildlife*
- *Need a technical toolbox that is user-friendly to market but still need technical support to ensure success of buffers, especially if public money used*
- *Package it as a win-win situation*

Suggestions for Program Approaches

The presentations of Steve Davis, Nancy Tilt, Tracey Ryan and Andy Graham elicited a variety of comments during the breakout sessions. In general, participants were very interested in the proposal presented by Tracey and Andy, although one major criticism was that the proposed funding would likely be inadequate. However, the concensus was that this proposal could act as a starting point for discussion of a program.

As a beginning step towards creation of a new program, some suggested that existing regulations be used under various acts (e.g. Drainage Act) to encourage riparian buffers. However, it was recognized that to establish a sound foundation for a program, there needed to be synthesis of all Science/social/economic information in order to acquire better information of what would be gained by buffers of various widths under different conditions. This information would lead to development of various implementation approaches. In a legislative approach, a minimum might be set of "x" meters and then incentives built in for additional width for various functions. An example of the incremental widths approach is summarized below:

- *Base - # ft width minimum for $X/acre*

- *Add - # ft for filtering to a max of # ft for $Y/acre*
- *Add - # ft for wildlife for $Z/acre*

In general, there was a suggestion that a Provincial based program should develop a baseline of understanding in order to determine the best delivery mechanisms by sector (e.g. rural vs urban), and the outcomes, implementation tools, etc., most appropriate to the sector.

THEME 5: GENERAL RIPARIAN/BUFFER RESEARCH NEEDS

As with Workshop I in October 1998, the participants at this workshop also encouraged the synthesis of information and the development of new information as essential to a successful program of riparian management. It was recognized that this information may be used at different levels of detail by different sectors, but without a sound basis for applying riparian buffers, expected outcomes will be difficult to determine and monitoring for success will be difficult. Despite the opinion of some that a good idea will prevail and be implemented, a good idea only PERSISTS when it is supported by good information.

One of the major research questions identified by many participants can be paraphrased as, "How wide does a riparian buffer have to be to achieve a specific preferred function?". This preferred function could be improved bank stability, reduction of phosphorous or nitrates to a stream, filtering of pathogens from surface run-off or other functions.

Participants stated that it is unlikely that the world will stand still while research answers all the questions needed to support a riparian buffer program. If a program is created, it will have to proceed with imperfect science and be designed to improve its' use of science as new information is uncovered. One means of doing this is to "learn by doing". Learn by doing suggests treating a project as an experiment and then using monitoring as a means to improve practice in the future. Most recently, this idea has been formalized into a process called adaptive environmental management. This approach formalizes how questions are asked, ensures that the design applied is well understood (i.e. rationale, hypothesis of results and understanding of function to be created). Monitoring is used to determine if the test achieves what is expected and if not, why not. In some cases, this will mean long-term monitoring (e.g. 3-10 years). Not all projects can be targeted this way, but perhaps a few that represent generic approaches (BMP's) can be used as surrogates for all others.

Below is a list of specific research areas/needs identified by the participants:

- *Need science to ID critical areas in stream system to realize water quality benefits*
- *Need to determine how to develop a low maintenance buffer;*
- *Carry on with adaptive environmental management. Carry out more targeted research. Continue with buffer implementation. Be flexible and apply new findings as we go; Conduct follow up monitoring within an Adaptive Environmental Assessment Approach;*
- *Need long term funding to monitor real world.*
- *Expand definition of buffer i.e. include windbreaks and instream works. Need to remember the difference between buffer and riparian zones – these need to be married.*

NEXT STEPS AFTER THE WORKSHOP

As a first major step, all participants urged that the proceedings of this workshop be completed and sent to

all attendees. However, it was also suggested that the proceedings also be established on a web-site for download to anyone interested, as was done with the first proceedings (see www.trentu.ca/wsc). Some suggested that copies of the proceedings also be sent to Federal agencies such as Environment Canada, AgCanada, Department of Fisheries and Oceans, stressing the diversity of groups that are now coming together and identifying riparian buffers as a major approach to environmental protection and restoration.

In order to better link the "doers" together and to create a stronger sense of purpose, several individuals suggested that a list server be created that provided a link to all groups and programs focussing on riparian buffer management. This server would also be used to update the member programs, provide information on current projects and results of previous projects and would act to link people together.

There was strong endorsement of the need for technical workshops that would provide practical information on "how to do" and "what to monitor". These workshops would be directed towards groups and organizations involved in implementation of stewardship and environmental programs. Information developed through science synthesis of world literature on riparian buffers could provide the practical information for these workshops.

From a process perspective, the question remains, how do we begin the process towards a riparian buffer program. This workshop and the previous workshop are likely strong starts. However we need to move further and faster. Some initiatives are already proposed and these should be endorsed and encouraged to move forward. Ministry of the Environment and a host of partnering agencies have proposed the development of a Riparian zone manual. This would include science synthesis, socio-economic information and the development of program models. The Ontario Cattlemen's Association has a proposal to Healthy Futures to develop a Buffer strip BMP manual for farmers. These initiatives are complementary and should be encouraged to proceed.

Finally, a committee should be established that includes the various Federal and Provincial agencies, non-government organizations and interest groups. This committee should then begin the process to lobby for the development of a riparian buffer program for Ontario. During the workshop, some participants suggested that the committee that organized this workshop might serve in that purpose.

[1]*SUMMARY*

RIPARIAN ZONE WORKSHOP 2000

John FitzGibbon, University Of Guelph

The workshop examined both the issues and the options for the development and implementation of a riparian buffers program.

PROGRAM RATIONALE

The primary motivation for the development of a riparian buffers program is the protection of water quality. Other major factors are the development of wildlife habitat and the protection and enhancement of aquatic habitat. Issues such as the development and management of drainage works and the impacts of tile drainage on a buffers program were raised. These may require a more comprehensive approach to rural drainage beyond riparian buffers.

ISSUES

- *How do we determine an appropriate width for a buffer given that different functions require different widths?*
- *What land uses should be provided for in the buffer zones given the problems of controlling invasive species and the need for management of wildlife.*
- *Who will pay for the losses of income due to loss of production from retired agricultural land? Incentives?*
- *Can the buffers provide for increased recreational opportunities and if so how will access be dealt with?*

SOLUTIONS

- *Programs will have to be adaptive and adjust to the different needs where they are appropriate. For example, buffer widths and land use will have to adjust to the priorities for the area and the characteristics of the site.*
- *Management of buffers should be carried out by landowners, with support other groups and agencies.*
- *Funding for buffers can be derived from a wide range of sources (municipalities for water quality, provincial and federal for wildlife and fisheries, from NGOs and community groups i.e. trails, fishing natural areas).*

WHO SHOULD BE INVOLVED

The development of buffers programs should take place as a partnership with each sector playing a role. Approaches could be based on watersheds which could provide a means developing strategy centered around priority areas and functions and building on the watershed planning initiatives found in a number of areas.

APPENDICES

I. Contact List – Committee/Speakers

II. Contact List – Participants

III. Agenda

Appendix A
Committee and Speaker List

I. CONTACT LIST – COMMITTEE/SPEAKERS

Committee

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Appendix B
Participant List

B. PARTICIPANT LIST

Name	*Affiliation*
Scott Abernethy	Ministry of Environment
Sheila Allan	Environment Canada
David Armitage	Ontario Federation of Agriculture
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Christy Arsenau	Landowner Resource Centre
Linda Barbetti	Ministry of Natural Resources
David Beaton	Credit Valley CA
Christine Bishop	Canadian Wildlife Service
Ronda Boutz	South Nation CA
Janette Brenner	Conservation Halton
Jose Brizard	South Nation CA
Meredith Carter	Otonabee CA
Dan Cassleman	Save the Rouge Valley System
Julie Cayley	Severn Sound Remedial Action Plan
Drew Cherry	Ministry of Natural Resources
Matthew Child	Essex Region Conservation
Pete Cott	Fisheries & Oceans Cda
Ron DesJardine	Ministry of Natural Resources
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Jamie Fisher	Fidale Farms Ltd.
Doug Forder	Environment Canada
Pam Fulford	Rouge Park
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Bill Gaines	Conservation Halton
Paul Gamble	Fleming College
Albert Garofalo	Student-Niagara College
Mary Lou Garr	Ontario Federation of Agriculture

Appendix B
Participant List

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Gareth Goodchild Fisheries & Oceans Cda

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Appendix B
Participant List

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Bina Paul	University of Guelph
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Karen Pugh	Upper Thames River Conservation Authority
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Karen Ralph	Fisheries & Oceans Canada
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Bridget Roche	University of Western Ontario
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Ramesh Rudra	University of Guelph
Jo-Anne Rzadki	Hamilton Region CA
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Dan Schaefer	Middlesex Stewardship Committee
Hal Schraeder	Ministry of Natural Resources
Janette Smiderle	
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Bill Snodgrass	TRCA
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Ted Taylor	OMAFRA
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Jeff Thompson	Thompson Environmental
Art Timmerman	Ministry of Natural Resources
Patricia Trainor	South Nation CA
Jane Tymoshuk	Fisheries & Oceans Canada
Mari Veliz	Upper Thames River Conservation

Appendix C
Workshop Agenda

	Authority
Dan Walters	University of Western Ontario
Cara Webster	
Hugh Whiteley	University of Guelph
George Wicke	Ontario Cattlemen's Association
Owen Williams	Ministry of Natural Resources
Eileen	Save the Rouge Valley System
Maya	Student-U of Guelph

C. WORKSHOP AGENDA

9:00 Introduction and Opening Remarks

9:10 Overview of October 1998 Workshop, including an overview of our understanding of riparian zone functions - Jack Imhof, MNR

9:30 Regulations - Riparian property rights, mandatory set-backs, enforcement of existing regulations, new legislation - Ian Attridge (Peterborough Lawyer)

10:10 Incentive Programs
Innovation from the States - Steve Davis, Ohio Natural Resources Conservation Service

10:50 Break

11:15 Land Acquisition, Long Term Leasing & Purchasing Easements – Clair Murphy, Director, Water Resources, Fisheries and Aquaculture, Province of Prince Edward Island

12:00 Lunch

1:00 Evaluation of Buffer Strip Projects on Ontario Farms - Nancy Tilt, OSCIA

1:30 Ontario Cattlemen's Perspectives - Mike McMorris, OCA

1:50 Program Ideas for Ontario - Tracey Ryan, GRCA and Andy Graham, OSCIA

2:10 Break out Sessions
- What do we need to better manage riparian zone buffers in Ontario?
- What should be the next?

3:30 Plenary and Brief Reports - John FitzGibbon, University of Guelph

4:00 Close of Workshop

Appendix C
Workshop Agenda