
APPENDIX A

Executive Summary

Jock River Watershed Plan — Interim Report

The purpose of this report is to consolidate all data gathered and to summarize what is known about the Jock River basin and its resources. The report describes the watershed's current ecological condition and existing problems. The report contains the baseline information needed to establish watershed objectives. The full component reports of each chapter are available in Volume II.

The key findings are summarized below:

Land Use

- The Jock River watershed is primarily a rural watershed with the majority of the population residing in the lower, more urbanized portion of the watershed.
- Development in the past has been sporadic in the rural areas and concentrated in Nepean and Kanata at the lower end of the watershed. Development in the future is expected to follow this trend with the emphasis of development to be in the South Urban Community within the City of Nepean.
- Land Use Management practices occurring in the watershed are a mixture of new practices, designed to improve environmental quality and age old practices which may impact the natural environment.

Recreation and Public Land Use

- The Jock River watershed presently provides a good variety of recreational opportunities such as fishing, hiking, nature appreciation, snowmobiling and cross country skiing and has the potential to provide more. Some municipalities and interest groups have plans to increase the recreational opportunities in the area.
- Almost 4,000 ha of land in the watershed is publicly owned.
- The Jock River is deemed a navigable waterway and, as such, is available for all forms of recreation and public use.

Wetlands

- Wetlands make up 18% of the watershed area. Sixty percent of them occur within 30% of the land area (Lanark County at the upper end).
- Wetlands play an important role in providing wildlife habitat, storing flood waters, releasing water during dry periods and as groundwater recharge and discharge areas.

Ecological Features

- The overall ecological health of the watershed is good in the upper sections and poor in the lower. The poor health in the lower reaches is due to lack of forest cover,

loss of riparian habitats, channelization of water courses, poor water quality and loss of wetlands.

- The Jock River corridor ecosystem downstream of Ashton and especially downstream of Richmond, has been significantly impacted by land use practices. Above Ashton, the area is in a relatively natural state.
- Twelve provincially significant and 1 endangered species have been recorded in the watershed. Five provincially significant Areas of Natural and Scientific Interest (ANSIs) have been identified. The Jock River is one of the few rivers in Eastern Ontario that is home to the sport fish, Muskellunge.
- Information gaps have been identified which, if filled, would give a more accurate assessment of the health of the watershed.

Surface Water Quantity

- Water levels on the Jock River are typically high in spring and gradually decline to their lowest levels in the fall. Wide floodplains exist in some areas. Low flows are typical in the upper watershed during the summer.
- Flood plain estimates have been generated using air photo interpretation in the area above Richmond to Ashton.

Surface Water Quality

- The Jock River suffers from mild to moderate water quality impairment.
- Phosphorus levels (which promote excessive weed growth) are consistently above the provincial guideline.
- Bacteria levels often exceed the provincial objective, making the Jock River questionable for water-contact recreation (swimming).
- A number of land uses and potential sources of pollution have been identified specific to the Jock River, however, further research is necessary to pinpoint these sources and determine their impact.

Groundwater

- Groundwater is the major source of potable water in the watershed.
- Groundwater quality is generally good with some localized problems. Iron levels are consistently high.
- Groundwater quantity is good with some cones of depression in the Richmond and Ashton areas.
- In general, the upper portion of the watershed is a groundwater recharge area while the lower a discharge area.
- Groundwater is the main contributor to streamflow in the late summer and is therefore important in maintaining the health of the aquatic ecosystem.

APPENDIX B

Table A2-1: Watershed Management Actions to address Surface Water Quality Water Issues

Issue: Poor Surface Water Quality	Objective: Improve, Protect and Maintain Surface Water Quality
Concerns & Influencing Factors:	Land Management Practices, Farming Practices, Faulty Septic Systems Stormwater Runoff, Attitudes towards Environment
Recommended Actions	
Education	<ul style="list-style-type: none"> • continue/introduce education programs
Stewardship	<ul style="list-style-type: none"> • continue/introduce incentive programs e.g., City's Rural Clean Water Program, OMAFRA's Healthy Futures Program, a similar program for Lanark County • promote use of best management practices • adopt and apply environmentally responsible procedures for application of road de-icing salts and grit • conduct regular clean ups of the Jock River
Scientific Research/Studies	<ul style="list-style-type: none"> • conduct investigative water quality monitoring to determine sources of impairment • develop a subwatershed plan on Flowing Creek (and other tributaries as need arises) to address water quality and urban development issues • determine nutrient budget of watershed • investigate the cumulative impact of surface water taking permits on surface water quality
Capital Projects/ Infrastructure	<ul style="list-style-type: none"> • improve sewage treatment methods where necessary to lessen impacts on the local environment • improve wastewater collection and treatment systems where needed (e.g. Richmond, Munster) • explore alternative methods to treat sewage for all new systems and those requiring major maintenance to meet the Ontario Water Quality Objectives (OWQO) and watershed objectives
Planning & Development Control	<ul style="list-style-type: none"> • apply stormwater management practices required to meet watershed objectives for surface water quality and groundwater quality, as stated herein • develop a "No Net Decline of Surface Water Quality Policy" in all planning documents
Restoration, Rehabilitation and Management	
Monitoring	<ul style="list-style-type: none"> • continue baseline surface water quality monitoring (in stream) • continue water quality monitoring at sewage lagoons, stormwater management ponds (performance/compliance monitoring) • undertake investigative water quality monitoring to identify sources of water quality impairment (both point and non-point). This should be focussed on the heavily impacted tributaries (Flowing and Leamy Creeks) as well as the downstream areas; correlate water quality with land use and land management practices, if possible • continue and expand macro-invertebrate sampling program, using bio-indicators as a measure of stream water quality, and trends in same.
Legislation/Enforcement	<ul style="list-style-type: none"> • investigate means of requiring mandatory septic system inspections at sale of property • review the surface water taking permit process to assess cumulative impact from water takings on a watershed basis and the adequacy of compliance monitoring

Table A2-2: Watershed Management Actions to address Water Quantity Issues — High Water Levels and Low Flows

Issue: Water Quantity — High Water Levels and Low Flows Objective: Achieve Manageable, Sustainable Water Levels

Concerns & Influencing Factors: potential for overbank flooding, flood damage avoidance; dessication of aquatic habitat at low flow, low assimilative capacity = low tolerance for non-point and point source pollutants

Recommended Actions

Education	<ul style="list-style-type: none"> • provide information on water cycle/balance
Stewardship	<ul style="list-style-type: none"> • control the beaver population by trapping and remove beaver dams and/or install beaver bafflers, where beaver activity causes excessive local water levels and interferes with adjacent land use
Scientific Research/Studies	<ul style="list-style-type: none"> • review the accuracy of existing flood plain mapping in areas of flat topography and no defined river valley (e.g. Village of Richmond; Cedarview to Greenbank) • complete flood plain mapping in river corridor (where there is no existing mapping), prior to changing land use designations, or land division by severance or subdivision
Capital Projects/	<ul style="list-style-type: none"> • existing water control structures play no significant role in overall Jock River watershed management, but may have local significance — review their local role and function, with the locally affected communities; and implement locally derived plans for their ongoing use and operation, or removal, as appropriate
Planning & Development	<ul style="list-style-type: none"> • protect groundwater recharge and discharge areas in planning documents; review development plans to ensure no net loss in groundwater recharge, and no lowering of near surface groundwater table • apply results of groundwater and water budget studies in the implementation of policies to achieve no net loss of baseflow due to planned development and resource utilization in the watershed • protect all wetlands in land use planning documents
Restoration, Rehabilitation and Management	<ul style="list-style-type: none"> • enhance riparian vegetation through stewardship efforts, volunteers, etc.
Monitoring	<ul style="list-style-type: none"> • conduct baseflow and surface flow monitoring throughout the watershed to refine water budget estimates on a sub-watershed basis, and to better understand groundwater/surface water inter-relationships and the important factors governing baseflow and groundwater conditions
Legislation/Enforcement	<ul style="list-style-type: none"> • review the surface water taking permit process to assess cumulative effects on a watershed basis and effectiveness of compliance monitoring • consider extending Fill and Construction Regulations on hazardous lands, after updating and extending flood risk mapping

Table A2-3: Watershed Management Actions to address Fish, Wildlife and Plant Life Issues

Issue:: Healthy, diverse Fish, Wildlife and Plant Life

Objective: Achieve Appropriate Biodiversity for Fish and Wildlife Populations

Concerns & Influencing Factors: Poor/limited biodiversity (especially d/s end); limited/impacted vegetative cover; decrease in significant habitats; development pressures; farming

Recommended Actions

Education • hold workshops, seminars and distribute literature on the importance of vegetation and the role it plays

Stewardship • encourage community groups and landowners to plant trees and shrubs along the river and tributaries
 • use existing and new stewardship programs to enhance wildlife habitat
 • promote a voluntary catch and release policy for fishing in the Jock River
 • promote a voluntary limit or restriction on the use of motorized water craft on the Jock River
 • encourage landowners to protect/enhance riparian vegetation
 • pursue funding opportunities (incentive programs) for vegetation enhancement

Scientific Research/Studies • map fish habitats of the river and identify areas with rehabilitation potential
 • prepare a Fisheries Management Plan for the Jock River and its tributaries, in which ways and means of restoring or maintaining the fishery near its potential to support an appropriate diversity of fish species throughout their full life cycles
 • identify wildlife habitat enhancement areas (corridors and linkages) and identify priorities for their restoration
 • periodically review and update the status and boundaries of Areas of Natural and Scientific Interest and wetlands
 • develop biodiversity plans for each reach and tributary of the watershed, as part of subwatershed studies
 • apply MNR's Stream Assessment Protocol to the Jock River and its tributaries to establish detailed information on aquatic habitat and aquatic species present in the system
 • develop a vegetation classification system (or apply the one completed for ROC, or an MNR-supported ecological land classification protocol) for the County of Lanark to identify significant natural areas worthy of protection
 • re-evaluate and/or update all wetlands evaluated with the "old" version of MNR's evaluation system and evaluate all unevaluated wetlands

Capital Projects/ • create new wetland habitats as appropriate (especially downstream of Richmond)

Planning & Development • implement Official Plan policies which protect wildlife habitat e.g. corridors and linkages, riparian vegetation, upland vegetation
 • protect woodlots through public acquisition, conservation easements and private land stewardship programs (especially downstream of Richmond)
 • protect all wetlands in municipal planning documents and through acquisition and incentive programs
 • protect all forms of fisheries habitat in all planning documents and development approvals
 • protect the riparian zone of the river and all tributaries in all municipal Official Plans
 • develop vegetation protection and enhancement policies in municipal Official Plans and zoning by-laws
 • implement the former Regional Municipality of Ottawa Carleton's Official Plan policies regarding the protection of vegetative cover (Sect. 5.2.1)
 • include clauses in subdivision and site plan agreements to protect existing and encourage the planting of new trees in all new developments

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Restoration, Rehabilitation	<ul style="list-style-type: none"> • develop a healthy (treed) riparian corridor the length of the Jock River and its tributaries • enhance upland wooded areas and create linkages to allow for increased biodiversity and movement/habitat of species • implement proven techniques to minimize problems related to invasive species (e.g., purple loosestrife) • create links with projects and programs outside of the watershed to educate stakeholders about the connection of the Jock River watershed to the rest of the world e.g. Algonquin to Adirondacks, RiverCare 2000, Rideau River Round Table and other Rideau River projects, etc. • identify and map candidate areas for habitat improvement via tree planting and re-naturalization • re-establish linkages between fragmented forest areas, especially downstream of Richmond
Monitoring	<ul style="list-style-type: none"> • monitor the extent of invasive species in the Jock watershed • conduct terrestrial habitat studies and monitoring to determine species varieties, biodiversity, health of the terrestrial environment; this would include both animal and plant inventories in a variety of terrestrial environments e.g. grasslands, wooded areas, scrub areas • determine the role and importance of linkages within the watershed by monitoring the movement of wildlife about the watershed. This can help identify areas in which linkages could be enhanced.
Legislation /Enforcement	<ul style="list-style-type: none"> • regulate the drainage and filling of wetlands to protect their vital functions, using Section 28 of the <i>Conservation Authorities Act</i>

Table A2-4: Watershed Management Actions to address Groundwater Quality and Quantity Issues

Issue: Groundwater Quality and Quantity	Objective: Protect Groundwater Quality and Quantity
Concerns & Influencing Factors:	No known severe impairments or shortages in deep aquifers, at the present time; heads up to avoid in future; baseflow depletion due to lowering of near surface groundwater table and surface water withdrawals are of concern
Recommended Actions	
Education	<ul style="list-style-type: none"> • Provide educational material re: Best Management Practices for Agriculture, the importance of protecting groundwater quality and quantity
Stewardship	<ul style="list-style-type: none"> • Develop a program offering incentives for the use of BMP's in rural wastewater and runoff management, well head/recharge area protection
Scientific Research/Studies	<ul style="list-style-type: none"> • conduct groundwater studies (obtain low flow, rainfall and groundwater data), to obtain a better understanding of the hydrogeology, hydrologic cycle and water budget of the basin, including: • assess cumulative effects of pits and quarries operations on groundwater resources <ul style="list-style-type: none"> • assess the need for a well head protection program • investigate the degree to which groundwater quality is affected by present land or land use practices, or contamination sources • assess potential for aquifer drawdown in the Richmond vicinity due to planned/present consumption • quantify groundwater/surface water flux in wetland areas as it varies with changing near surface groundwater table level; in so doing contribute to a deeper understanding of the hydrologic function of key wetlands in the watershed -specific attention to Goodwood Marsh, Franktown Swamp and the Richmond Fen
Capital Projects/ Infrastructure	
Planning & Development	<ul style="list-style-type: none"> • implement policies protecting baseflows, groundwater recharge/discharge areas in municipal planning documents • review construction plans for utilities, roads and drainage systems in urban and suburban developments, and agricultural land drainage schemes for their potential impact on near surface groundwater levels and baseflows in the Jock River and its tributaries. Where groundwater levels and baseflow may be impacted, require mitigation measures
Restoration, Rehabilitation and Management	<ul style="list-style-type: none"> • complete an aquifer management study in the watershed as part of the former Region of Ottawa-Carleton's Aquifer Management Strategy
Monitoring	<ul style="list-style-type: none"> • setup and operate a network of groundwater monitoring stations, to monitor fluctuations in deep and near surface groundwater levels and to detect changes in groundwater quality over time
Legislation/Enforcement	<ul style="list-style-type: none"> • examine the groundwater water taking permit process and devise a method for assessing cumulative impacts on baseflows in Jock River and its tributaries from groundwater takings • enforce pits and quarry extraction and rehabilitation policies and procedures

Table A2-5: Watershed Management Actions to achieve Sustainable Land Use and Development

Issue: Sustainable Land Use & Development

**Objectives: Achieve environmentally sustainable farming and development to meet human needs
Improve and Expand Appropriate Recreation Opportunities**

Concerns & Influencing Factors: Little concern for natural environment in land management practices
Lack of knowledge/information/studies

Recommended Actions

Education

- use subdivision agreement to require information on receiving stream protection aspects of development design to be passed on to home purchaser, to maximize effective use of at-source water quality controls
- develop interpretive programs in all Jock River parks and conservation areas
- disseminate information on recreational opportunities available to be enjoyed in public open spaces in the Jock River watershed

Stewardship

- promote the use of Best Management Practices in all farming activities — fencing livestock from watercourses, manure management and storage, milkhouse washwater management, tillage practices, establishing buffer strips along the river. etc.
- promote the use of the Environmental Farm Plan program on a site by site voluntary basis
- drainage guidelines, promoting good environmental practices to be encouraged by all municipalities for all new and maintained municipal drains
- continue Ottawa’s recently-initiated Rural Clean Water Program, and extend it through Beckwith and Montague Township, with funding to be sought through the OMAFRA’s Healthy Futures Program, or other sources
- review maintenance standards and practices at all existing and proposed parks along the Jock River, for compatibility with river conservation objectives
- determine ownership of the bed of the river through title searches at land registry office

Scientific Research/Studies

- prepare subwatershed plans as needed on the tributaries and reaches of the Jock River to address issues which require more detailed analysis and planning.

**Capital Projects/
Infrastructure**

Planning & Development

- recognize and plan for the preservation of prime agricultural land in all planning documents
- promote stewardship principles to municipalities, professional planners, developers, etc. to ensure new development is designed “with nature in mind”
- adopt and apply an environmental planning ethic and the principle of sustainability in all planning documents and decisions
- develop and enforce setback policies in all Official Plans and zoning by-laws to prohibit development within 30m of any watercourse, or to require justification of smaller setbacks based on acceptable environmental impact evaluations completed by competent professionals, considering adjacent land uses, pollution potential, present condition of buffer strip and restoration potential, if any.
- make direct reference to background information and recommended strategies contained in this watershed plan, when interpreting the Provincial Policy Statements, and local planning policies, and deciding on new development proposals
- strengthen the multi-disciplinary planning and development review team involved in the review of development in the watershed, to ensure co-ordinated and timely response to development proposals, from the perspective of the goals of the watershed plan

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- municipalities and supporting agencies to conduct Environmental Impact Studies on development where a significant watershed feature or function is involved/affected. The EIS must indicate that no adverse impacts on the form or function of the feature as identified in the watershed plan will result due to development
- create a natural open space corridor the length of the Jock River through municipal land acquisition, zoning, conservation easements, land trusts, etc.

Restoration, Rehabilitation

- prepare a conservation/management plan for the Jock River corridor
- encourage the linking of passive recreation trails throughout the watershed and beyond its boundaries
- support the implementation of the recommendations of the Richmond Conservation Area Master Plan

Monitoring

Legislation/Enforcement

- develop a mandatory septic system inspection and correction program to detect and correct malfunctioning systems
- ensure the effectiveness of new septic systems throughout the watershed through consistent enforcement of Part 8 of the *Building Code Act*

Table A2-6: Watershed Management Actions to address Issues related to Community Awareness and Concern

**Issue: Community Awareness and Concern Objectives: Create a sense of well being, pride and comfort with the river
Encourage a Green Way of Life
Encourage participation, co-operation and involvement of all members of the watershed in achieving a healthy watershed
Preserve the rural character of the watershed
Develop and promote a sense of Respect for the watershed and its Sustainability**

Concerns & Influencing Factors: Apathy, Lack of Knowledge, Lack of Commitment Cost (Real and Perceived),
Lack of Environmental Ethic

Recommended Actions

Education

- foster understanding of both urban and rural issues and values as regards watershed conservation, future development plans and other issues
- hold annual events to draw attention to the Jock River and its surroundings
- express pride in the rural nature and amenities of the watershed through festivals, celebrations (Jock River days) around themes related to rural living in the watershed and the community
- schools in the Jock River area should incorporate Jock River watershed characteristics, issues and features into their science, and environmental studies curriculum
- increase community awareness of cultural and heritage resources in the watershed
- educate all stakeholders about the importance and role of a healthy watershed on quality of life and health of all residents
- disseminate information on Best Management Practices in daily activities for all rural and suburban landowners including septic system maintenance, the use of fertilizers and pesticides, etc.
- City of Ottawa to develop and expand their interpretation programs (in conjunction with groups such as Friends of the Jock River) in their local parks
- demonstration sites to be exposed to the community as a way of encouraging stewardship practices
- erect signs at significant watershed features (watercourses, wetlands, watershed boundaries)

Stewardship

- support the creation of a Watershed Action Committee (WAC)
- Friends of the Jock River encouraged to expand their membership to attract more watershed residents to help achieve the goals of the group
- continue to encourage public participation in community-based efforts to improve the local watershed environment through tree planting, river clean ups, education opportunities, etc.
- encourage each resident, user, neighbour to accept personal responsibility for the health of the watershed
- consider developing and promoting an “Adopt a River” campaign
- recognize exemplary stewardship practices through awards and appreciation programs
- encourage the use of existing and new stewardship incentive programs to improve land management practices and to enhance significant watershed features e.g. water quality program, Wetland Habitat Fund program, CFIP, etc.
- promote voluntarism and create opportunities for volunteer participation in watershed management activities
- Friends of the Jock River encouraged to continue in their efforts of conducting river clean ups, tree planting, providing information education services such as information kiosks and interpretation at local parks and natural areas

Scientific Research/Studies

Capital Projects/
Infrastructure

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Planning & Development

- review Official Plan policies as to their effectiveness at encouraging the location and design of subdivision development so as to retain the watershed’s rural character; amend policies and implement them if/as required

Restoration, Rehabilitation and Management

- use land trusts to raise funds to support stewardship programs and purchase significant corridor lands
- use various instruments for holding title or obtaining access or other interests (e.g., conservation easements, acceptance of land donations, etc.) on fragile, “retired” and sensitive lands which play important roles in the natural heritage system of the watershed; includes wetlands, flood plains, significant habitats, etc.

Monitoring

- foster volunteer efforts by publishing a *Volunteer Handbook* instructing community volunteers on how to collect and where to submit information pertaining to the flora and fauna, water quality, water levels, terrestrial habitats, etc. of the watershed

Legislation /Enforcement

