



**BAY OF QUINTE
REMEDIAL ACTION PLAN**

**RESTORATION COUNCIL
WORK PLAN**

2006-2010

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Endorsed by the Bay of Quinte RAP Restoration Council
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TABLE OF CONTENTS

SECTION A	Background	1
A.1	Introduction	1
A.2	Responsibilities and Funding Uncertainties	1
A.3	Achieving Natural Recovery Status.....	2
A.4	Supporting Programs and Initiatives	3
A.5	Bay of Quinte Area of Concern's Impaired Beneficial Uses (IBUs).....	4
A.6	Delisting Targets for the Bay of Quinte Impaired Beneficial Uses	4
A.7	Bay of Quinte RAP Work in Progress During 2005/06.....	4
SECTION B	The BQ-RAP Restoration Council	5
B.1	The Restoration Council	5
B.2	Restoration Council Tasks for 2006-2010.....	6
SECTION C	Nutrient Enrichment Issue	9
C.1	Background.....	9
C.2	Bay of Quinte Nutrient Enrichment Related IBUs	9
C.3	Nutrient Enrichment Related Tasks in Progress During 2005/06.....	9
C.4	Nutrient Enrichment Related Tasks for 2006-2010.....	10
SECTION D	Toxic Contaminants Issue	13
D.1	Background.....	13
D.2	The Bay of Quinte Toxic Contaminants Related IBUs	13
D.3	Toxic Contaminants Related Tasks in Progress During 2005/06.....	13
D.4	Toxic Contaminants Issue Related Tasks for 2006-2010	14
SECTION E	Bacterial Contamination Issue	18
E.1	Background.....	18
E.2	Bay of Quinte Bacterial Contamination Related IBUs	18
E.3	Bacterial Contaminants Issue Tasks In Progress During 2005/06	18
E.4	Bacterial Contaminants Related Tasks for 2006-2010	18
SECTION F	Fish and Wildlife Issue	20
F.1	Background.....	20
F.2	Bay of Quinte Fish and Wildlife Related IBUs	20
F.3	Fish and Wildlife Related Tasks in Progress During 2005/06	20
F.4	Fish and Wildlife Tasks for 2006-2010	21
Section G	BQ-RAP Implementation Office	24

G.1	BQ-RAP Implementation Office	24
G.2	BQ-RAP Implementation Manager	24
G.3	Implementation Office - Communications and Consultations	26
G.4	Implementation Office - Technical Support Staff Tasks for 2006-2010	28

Tables

A	IJC List of 14 Impaired Beneficial Uses for Areas of Concern With the 10 Designated Bay of Quinte IBUs shown in bold	5
B	Restoration Council Tasks in 2006-2010 Work Plan.....	8
C	Nutrient Enrichment Related Tasks in 2006-2010 Work Plan.....	12
D	Toxic Contaminants Related Tasks in 2006-2010 Work Plan.....	16
E	Bacterial Contamination Related Tasks in 2006-2010 Work Plan.....	19
F	Fish and Wildlife Issue Related Tasks in 2006-2010 Work Plan.....	23
G.1	Implementation Manager Tasks in 2006-2010 Work Plan.....	26
G.2	Communications and Consultations Coordinator’s Tasks in 2006-2010 Work Plan.....	28

APPENDICES

Appendix A	Estimated Restoration Council and BQ-RAP Implementation Costs.....	29
Appendix B	Existing Impaired Beneficial Uses Delisting Targets.....	32

SECTION A Background

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A.1 Introduction

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In 1985 the Bay of Quinte was formally recognized as being a Great Lakes **Area of Concern** (AOC) - a label relegating the bay to a list of 42 severely contaminated local areas in the Great Lakes System. In response, the governments of Canada and Ontario committed themselves to the development and implementation of the **Bay of Quinte Remedial Action Plan** (BQ-RAP) for the purposes of restoring the environmental quality and beneficial uses of the bay. After years of dedicated effort by numerous agencies, the municipalities and a great many people, the BQ-RAP is approaching a significant milestone that would see the AOC progress from the **'implementation phase'** to a **'natural recovery phase'**. When the implementation phase is completed, it is anticipated that restoration of the Bay of Quinte, through natural recovery processes, will occur to the extent necessary to eventually allow delisting of the Bay of Quinte as an Area of Concern.

Formal recognition that the Area of Concern has reached the natural recovery phase will occur when all reasonable and practical remedial measures have been taken and scientific rationale supports the conclusion that further recovery of the ecosystem will occur, over time, through natural processes. However, at the moment, further remedial measures are required to complete implementation of all reasonable and practical interventions. Also, recovery end-points and delisting criteria need to be quantified and refined to reflect new science and new realities in Lake Ontario. Additionally, long-term management and monitoring programs must be enshrined into agency programs to track the natural recovery process and provide commitments of eternal vigilance and perpetual care of this wonderful resource.

It is the goal of the BQ-RAP Restoration Council to complete all remaining tasks and move the AOC from the implementation phase to a natural recovery phase in 2010 and to support monitoring of recovery in order to verify the ultimate delisting of the AOC. This document is a work plan for achieving this goal.

A.2 Responsibilities and Funding Uncertainties

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Responsibility for guiding the Bay of Quinte Area of Concern through implementation to the natural recovery phase rests with the BQ-RAP Restoration Council member agencies which in turn receive guidance and funding from a RAP Team Leaders Committee consisting of representatives from Environment Canada (EC), Ontario Ministry of the Environment (MOE), Ontario Ministry of Natural Resources (MNR), and the federal Department of Fisheries and Oceans (DFO).

In May 2005, the Team Leaders Committee urged the Restoration Council to develop a comprehensive multi-year work plan to bring the BQ-RAP implementation actions to completion in 2010. Inherent in the Team Leaders Committee direction to the Restoration Council was an understanding that significant agency funding would be provided to complete the implementation phase of the BQ-RAP. Since the May 2005 Team Leaders Committee direction to the Restoration Council, the schedule of the Committee to provide the funding required to complete the implementation phase of the BQ-RAP has become uncertain. The central agencies are currently winding up work under the final year of the 2002 Canada-Ontario Agreement (COA), organizational changes are occurring in Environment Canada, and a process has begun to review the Great Lakes Water Quality Agreement. These factors may affect agency abilities to make the necessary funding commitments in a timely manner. This in turn creates uncertainty concerning the BQ-RAP Restoration Council's ability to hire and retain, at a competitive rate of remuneration, competent staff to move this work plan through to completion and achieve the 2010 natural recovery goal.

In light of uncertain funding and resource levels, the Restoration Council wishes to stress that the delivery of the tasks set out in this Work Plan is entirely contingent upon the provision, in a timely fashion, of sufficient human and financial resources. The current funding situation suggests that the goal of moving the Area of Concern into the natural recovery phase during 2010 may be compromised.

A.3 Achieving Natural Recovery Status

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The purpose and scope of this Work Plan is to identify the remedial measures, scientific information and agency, stakeholder and community commitments necessary to satisfy the Restoration Council's criteria for moving the Bay of Quinte Area of Concern from the implementation phase to a natural recovery phase in the year 2010. Delisting of the AOC would occur when there is concurrence that impaired beneficial use (IBU) delisting targets have been met.

It is the intent of the BQ-RAP Restoration Council to seek natural recovery status for the Area of Concern when it is satisfied that the following criteria are met:

- I. Monitoring data reveal positive trends towards pre-determined impaired beneficial use delisting targets or that the targets have been met. (Task G3)
- II. A scientific rationale exists to support a conclusion that natural recovery will occur over time. (Task G9 and G10)
- III. Clearly defined processes and agency roles exist to ensure diligent, long-term management of the resource and to prevent any reversal of the accomplished restoration. (Task B5)

- IV. Commitments exist to maintain Bay of Quinte baseline monitoring programs into the natural recovery phase. (Task G4)
- V. Funding mechanisms and sustainable agency, stakeholder and community commitments exist to provide perpetual care of the Bay of Quinte ecosystem. (Task B5)
- VI. All reasonable and practical interventions, as identified herein, have taken place.
- VII. There is community concurrence that the RAP has been fully implemented and area in recovery designation is justified.

These measures are outlined in the remaining portion of this document as follows:

- Part B - Restoration Council
- Part C - Nutrient Enrichment Issue
- Part D - Toxic Contaminants Issue
- Part E - Bacterial Contaminants Issue
- Part F - Fish and Wildlife Issue
- Part G - Implementation Office.

For each part of the plan, a summary table is provided showing the required tasks, roles and schedules for their completion.

A.4 Supporting Programs and Initiatives

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The work of the BQ-RAP receives tremendous support from numerous partners, programs and initiatives that protect and restore habitat and improve environmental quality. Supporting programs and initiatives range from improvements to environmental legislation and policy to the efforts of individual volunteers and landowners, and are too numerous to mention them all. A brief list of supportive initiatives is provided below to illustrate the overall context that the BQ-RAP operates within to achieve its objectives. In many cases, because supporting initiatives are 'covering off' certain aspects of restoring environmental quality, it allows the BQ-RAP to focus its efforts elsewhere so it is important to identify and acknowledge these initiatives.

- Source Water Protection
- *Nutrient Management Act, federal Fisheries Act*
- Strengthening of the Provincial Policy Statement with respect to Natural Heritage Planning
- Revision of the Generic Regulations (Ontario Regulation 97/04)
- *Oak Ridges Moraine Act*
- Numerous not-for-profit organizations and conservation organizations such as Ducks Unlimited, Wetland Habitat Fund, Environment Canada's EcoGift program, Land Trust Associations, Ontario Woodlot Association, Ontario

Nature, Ontario Federation of Anglers and Hunters, Ontario Stewardship etc.

A.5 Bay of Quinte Area of Concern's Impaired Beneficial Uses (IBUs)

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In 1985, the Great Lakes Water Quality Board of the International Joint Commission identified 42 local Great Lakes environments as Areas of Concern owing to severe water and sediment quality problems that negatively influenced beneficial uses. The governments of Canada and the United States responded with a commitment in the 1987 Great Lakes Water Quality Agreement to develop and implement Remedial Action Plans to restore the environmental quality and beneficial uses of each of the designated Areas of Concern. The Bay of Quinte was included as one of the Areas of Concern owing to environmental and use impairments related to bacteria, excessive nutrient enrichment, persistent toxic contaminants, and degradation of fish and wildlife populations and habitats. Environmental impairment of the Bay of Quinte ecosystem was identified as having negative impacts on ten beneficial uses. An eleventh was determined to require further assessment. The Bay of Quinte IBUs are shown in Table A below.

A.6 Delisting Targets for the Bay of Quinte Impaired Beneficial Uses

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In the Bay of Quinte RAP Stage 2 report (Time to Act, 1993), a set of delisting objectives was proposed to provide a means of measuring the success of the ecosystem cleanup/remediation program. Some of the original objectives were deemed to be out of date and were replaced by the BQ-RAP Restoration Council in May 2000, by more quantifiable delisting targets, following a scientific review and public consultation process. These current delisting targets appear in Appendix B of this document. Further refinement and quantification of the delisting targets are tasks identified in this Work Plan.

A.7 Bay of Quinte RAP Work in Progress During 2005/06

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Following the completion of the Restoration Council's 2000-2005 Work Plan, a significant number of crucial BQ-RAP investigations and implementation activities were initiated and either finalized or are currently in an advanced state of completion. These initiatives are documented in the appropriate issues sections of this report. The findings of some of these investigations/initiatives were not available in time to be considered in development of the 2006-2010 Work Plan. It is possible that the need for additional works during the 2006-2010 planning period will be identified from the findings of these initiatives.

Table A IJC List of 14 Impaired Beneficial Uses (IBU) for Areas of Concern with the 10 Designated Bay of Quinte IBUs Shown in Bold.

#	IMPAIRED BENEFICIAL USE	DESIGNATION
1	Restriction on fish & wildlife consumption	Impaired
2	Tainting of fish and wildlife flavour	Not impaired
3	Degradation of fish & wildlife populations	Impaired
4	Fish tumors & other deformities	Requires further assessment
5	Bird or animal deformities or reproductive problems	Not impaired
6	Degradation of benthos	Impaired
7	Restrictions on dredging activities	Impaired
8	Eutrophication or undesirable algae	Impaired
9	Restrictions on drinking water, taste and odour problems	Impaired
10	Beach closures	Impaired
11	Degradation of aesthetics	Impaired
12	Added cost to agriculture or industry	Not impaired
13	Degradation of phytoplankton & zooplankton populations	Impaired
14	Loss of fish & wildlife habitat	Impaired

SECTION B The BQ-RAP Restoration Council

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B.1 The Restoration Council

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The BQ-RAP Restoration Council is co-chaired by the Managers of Lower Trent Conservation and Quinte Conservation. It is a council with governmental and non-governmental representation, including: Mohawks of the Bay of Quinte (MBQ), Environment Canada (DOE), Fisheries and Oceans Canada (DFO),

Department of National Defense (DND), Ontario Ministry of Environment (MOE), Ontario Ministry of Natural Resources (MNR), Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), Quinte Watershed Cleanup (QWC), Lower Trent Conservation (LTC) and Quinte Conservation (QC). The Restoration Council is charged with the responsibility of providing overall direction for cleanup of the Bay of Quinte through implementation of the Bay of Quinte RAP Stage 2 recommendations, supporting work plans and other requirements as they arise.

The Restoration Council's accomplishments have been numerous and significant. This Work Plan outlines the Council's final ratcheting up of the implementation process and a path forward through the complex and time consuming delisting process defined in the 1987 Great Lakes Water Quality Agreement. While ecosystem restoration will not be complete at the end of the Work Plan in 2010, it is intended to seek recognition that the remediation phase of the BQ-RAP has been completed and the Area of Concern has entered a natural recovery phase in which further restoration will occur through natural recovery processes.

B.2 Restoration Council Tasks for 2006-2010

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In addition to the duties and responsibilities inherent in the Restoration Council's mission statement, the following tasks are assigned to the Restoration Council for 2006-2010.

The 2006-2010 Work Plan includes an extensive list of tasks required to fill the identified implementation and ecosystem assessment gaps. It is considered possible to complete the process within this short time frame; however, the partnership costs will be significant and funding commitments need to be established early in the 2006-2010 work period and confirmed at the beginning of each fiscal year. Each representative on the Restoration Council is urged to:

Task B1 Build internal agency awareness of, and support for, the 2006-2010 Work Plan and ensure that their agency's commitment to complete the implementation phase of the Bay of Quinte RAP in 2010 is built into annual work plans and budgets.

This and subsequent sections of the 2006-2010 Work Plan, outline the tasks required to complete the assessment and implementation components of BQ-RAP. It is crucial to the goal of moving the BQ-Area of Concern to the natural recovery phase that the tasks be initiated and completed on schedule. Revised schedules will need to be established if funding shortfalls, unexpected circumstances or new science alter the anticipated path to completion of the Work Plan. Accountability for implementation of this Work Plan rests with the Restoration Council.

Task B2 Ensure that recommended actions are being implemented on schedule and intervene whenever necessary to assure attainment of the AOC natural recovery phase in 2010.

Further, the Restoration Council will continue to promote the BQ-RAP implementation measures and monitor/facilitate ongoing environmental cleanup and remediation projects. The Restoration Council will:

Task B3 Encourage more involvement of the Bay of Quinte municipalities (staff, councilors) and industry with Restoration Council priorities; provide recognition of the municipal/industrial actions that have already been taken in support of the BQ-RAP and promote the remaining municipal and industrial actions necessary to restore and protect the Bay of Quinte ecosystem.

Task B4 Monitor progress and provide technical review/input associated with the management of contaminated sites (e.g., Deloro, Bakelite, Zwick's Island Landfill, Meyer's Pier and Trent River Mouth sediments).

Recognition of the BQ-Area of Concern entering the natural recovery phase undoubtedly will bring with it a shift in agency priorities as well as stakeholder concerns about the future of the ecosystem. For these reasons, the Restoration Council is challenged to:

Task B5 Undertake an assessment of future management scenarios for the Bay of Quinte ecosystem and promote establishment of a plan that will put in place a community-based commitment (management and funding) to ensuring eternal vigilance and perpetual care for this tremendously valuable resource.

Additionally, the Restoration Council is to pursue the following two tasks as a means of recognizing that the Bay of Quinte RAP has been developed and implemented with a sound, science based focus towards ecosystem restoration.

Task B6 Host a technical symposium to celebrate attainment of the AOC natural recovery phase and highlight the contributions of Project Quinte and other partners to the science, monitoring and management of the Bay of Quinte.

Task B7 Publish a scientific synthesis of the entire base of Bay of Quinte scientific data and modeling capabilities.

Table B Restoration Council Tasks In 2006-2010 Work Plan

Task	IBU	Lead Role	Support Role	06/07	07/08	08/09	09/10
B1. Build agency awareness and support for completion of 2006-2010 Work Plan...	All	RC	RAP Team Leaders	xxxx	xxxx	xxxx	xxxx
B2. Ensure that recommended actions are being...	All	RC		xxxx	xxxx	xxxx	xxxx
B3. Encourage more municipal and industrial involvement...	All	RC		xxxx	xxxx	xxxx	xxxx
B4. Monitor progress and provide technical review...	1, 4, 6, 7, 14	RC	BQ-RAP/TS	xxxx	xxxx	xxxx	xxxx
B5. Develop and implement a community-based mechanism to provide perpetual care of the BQ ecosystem	All	RC		xxxx	xxxx	xxxx	xxxx
B6. Host a technical symposium to highlight BQ-RAP and Project Quinte...	All	RC					xxxx
B7. Produce scientific synthesis	All	RC					xxxx

SECTION C Nutrient Enrichment Issue

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C.1 Background

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Excessive enrichment of the waters of the Bay of Quinte with phosphorus and associated production of algae has been recognized as a key environmental concern since the late 1960's when phosphorus loadings from municipal sewage treatment plants reached a high of 215 kg/day and water quality complaints were frequent. By 1985, when the Great Lakes Water Quality Board of the International Joint Commission recommended designation of the Bay of Quinte as an Area of Concern, phosphorus loadings from sewage treatment plants had already been reduced to 32 kg/day. Since initiation of the BQ-RAP in 1987 to the present, phosphorus loadings from coastal sewage treatment plants have been further reduced to a current more sustainable range of about 12-15 kg/day during the summer months.

With phosphorus loadings to the bay now nearing what is considered to be sustainable levels, emphasis of the Bay of Quinte research scientists and the BQ-RAP Restoration Council has shifted to the use of a phosphorus loading model that will facilitate the establishment and implementation of a phosphorus management strategy.

C.2 Bay of Quinte Nutrient Enrichment Related IBUs

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Nutrient enrichment of the waters of the Bay of Quinte is recognized as being a causative factor wholly or partially responsible for seven of the bay's ten Impaired Beneficial Uses. These IBUs are listed below. The existing delisting targets for the nutrient related IBUs are provided in Appendix B.

IBU # 3	Degradation of fish and wildlife populations
IBU # 6	Degradation of benthos
IBU # 8	Eutrophication or undesirable algae
IBU # 9	Restrictions on drinking water or taste and odour problems
IBU #11	Degradation of aesthetics
IBU #13	Degradation of phytoplankton and zooplankton populations
IBU #14	Loss of fish and wildlife habitat

C.3 Nutrient Enrichment Related Tasks in Progress During 2005/06

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During 2005/06, a number of key nutrient enrichment related tasks were initiated. The outcomes of these investigations/actions were not available in time to be considered in the preparation of this Work Plan. It is possible these tasks, when completed, will identify the need for additional investigations or actions during the period of this 2006 - 2010 Work Plan. The tasks in progress during 2005/06

included the following:

- Initiate development of a Bay of Quinte phosphorus management strategy and its implementation. (MOE)
- Continuation of Project Quinte Monitoring. (DFO)
- Production of 2004 Annual Project Quinte Report. (DFO)
- Continued development of Ecopath ecosystem model. (DFO)
- Synthesis report dealing with 2004 and all historical macrophyte data. (DFO)
- Continued development of historical benthos data base to include recoverable soft and hard substrate. (DFO)
- Ongoing development of Bay of Quinte scientific data base/information system. (DFO)
- Resurvey Bay of Quinte zebra mussel population. (DFO)

C.4 Nutrient Enrichment Related Tasks for 2006-2010

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The recommended components of the 2006-2010 work plan for the nutrient enrichment related IBUs are listed below and summarized with schedules for completion in Table C.

- | | |
|---------|---|
| Task C1 | Review and revise, as necessary, the nutrient related IBU Delisting Targets. |
| Task C2 | Undertake municipal STP optimization/upgrade studies for facilities with discharges to the Bay of Quinte. |
| Task C3 | Complete development of phosphorus management strategy. |
| Task C4 | Implementation of phosphorus management strategy in cooperation with local municipalities. |
| Task C5 | Undertake an assessment of historical and current taste and odour and toxic algae related data from Bay of Quinte municipal water treatment plants. |
| Task C6 | Develop and initiate a program to assess taste and odour and toxic algae conditions in Picton Bay. |
| Task C7 | Continue Project Quinte research and monitoring program. |
| Task C8 | Continue to produce annual Project Quinte Reports. |

- Task C9 Complete ordinance analysis and produce report of historic benthic fauna data.
- Task C10 Undertake a scientific re-assessment and produce report of phytoplankton and zooplankton data in reference to delisting targets.
- Task C11 Continue refinements to Ecopath ecosystem model.
- Task C12 Continue development of Bay of Quinte scientific data base/information system.
- Task C13 Complete development of Pollution Prevention and Control Plans (PPCPs) for Napanee, Deseronto and Picton and update PPCPs for Belleville and Quinte West.
- Task C14 Promote implementation of PPCPs for Napanee, Deseronto, Picton, Belleville and Quinte West.

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Table C Tasks, Agency Roles and Schedules for Nutrient Enrichment Issue In 2006-2010 Work Plan

Task	IBU	Lead Role	Support Role	06/07	07/08	08/09	09/10
C1. Review and revise, as required, the nutrient related IBUs	3,6,8,9,11,13	DFO	BQ-RAP, DOE, MOE	xxxx			
C2. Undertake STP optimization studies...	3,6,8,9,11,13	MOE	BQ-RAP, GLSF		xxxx		
C3. Complete development of P management plan and ...	3,6,8,9,11,13	MOE		xxxx			
C4. Implement P management strategy	3,6,8,9,11,13	MOE	RC		xxxx	xxxx	xxxx
C5. Assess historical taste and odour & toxic algae related...	9	MOE DOE	DFO	xxxx			
C6. Develop/undertake program to assess taste, odour and toxic...	9	MOE DOE		xxxx	xxxx	xxxx	xxxx
C7. Continue Project Quinte monitoring	3,6,8,9,11,13	DFO	MNR, MOE	xxxx	xxxx	xxxx	xxxx
C8. Produce annual Project Quinte reports	3,6,8,9,11,13	DFO	MNR, MOE	xxxx	xxxx	xxxx	xxxx
C9. Complete ordinance analysis of historic benthic fauna data...	6	DFO			xxxx	xxxx	
C10. Undertake scientific re-assessment of phyto and zooplankton data...	13	DFO			xxxx	xxxx	xxxx
C11. Continue refinements to Ecopath ecosystem model.	3,6,8,9,11,13	DFO		xxxx	xxxx	xxxx	xxxx
C12. Continue development of Bay of Quinte data base /information ...	3,6,8,9,11,13	DFO		xxxx	xxxx	xxxx	xxxx
C13. Advance development of PPCPS for...	3,6,8,9,11,13	MOE CA	BQ-RAP GLSF	xxxx	xxxx		
C14. Promote implementation of PPCPs...	3,6,8,9,11,13	MOE CA	BQ-RAP GLSF	xxxx	xxxx	xxxx	xxxx

SECTION D Toxic Contaminants Issue

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D.1 Background

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In the BQ-RAP Stage 2 report, five impaired beneficial uses were associated with a wide range of persistent toxic contaminants present in Bay of Quinte water, sediments and biota. Abatement programs have been implemented to reduce source inputs of toxic contaminants and programs are in progress to deal with a number of localized areas of sediment contamination. While cleanup progress has been made, the 2003 Restoration Council report *Bay of Quinte RAP Monitoring and Delisting Strategy IBU Assessment Statements 2003* found that the quantity of available environmental data and the level of its scientific interpretation could not support a positive rigorous comparison with the IBU delisting targets.

D.2 The Bay of Quinte Toxic Contaminants Related IBUs

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The impaired beneficial uses associated with toxic contaminants in the Bay of Quinte are as listed below. The existing delisting targets for the toxic contaminants related IBUs are provided in Appendix B.

IBU #1	Restrictions on fish and wildlife consumption
IBU #6	Degradation of benthos
IBU #7	Restrictions on dredging activities
IBU #9	Restrictions on drinking water

The status of IBU #4 (fish tumours and other deformities) is uncertain at the time of this writing; however, histopathological tissue analyses of brown bullhead specimens from the Bay of Quinte, which were initiated in 2005, will determine if fish tumours and other deformities is a Bay of Quinte IBU.

While delisting targets have been established for each of these IBUs, new scientific information and ecosystem changes have pointed to the need to review and revise some or all of these targets

D.3 Toxic Contaminants Related Tasks in Progress During 2005/06

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During 2005/06, a number of key toxic contaminants related tasks were initiated. The outcomes of these investigations/actions were not available in time to be considered in the preparation of this Work Plan. It is possible these tasks, when completed, will identify the need for additional investigations/actions during the period of this 2006 - 2010 Work Plan. The tasks in progress during 2005/06 included the following:

- Revisions to 2000 BEAST Study report (DOE).

- Histopathological analyses of brown bullhead samples (DOE).
- Interpretive analyses of all current and historical Bay of Quinte sediment quality data (DOE/BQ-RAP/MOE).
- Interpretive analyses of historical non-migratory sport fish and young-of-year fish contaminant data (MOE/BQ-RAP).
- Update of BQ contaminants fate and transport model (MOE/BQ-RAP/UofT)
- Data securement and gap analysis to facilitate eventual development of PPCPs for Napanee, Deseronto and Picton (also applicable to bacterial and nutrient related IBUs). (CA, BQ-RAP/MOE/GLSF)
- Remediation projects, Meyer's Pier, Deloro, Zwicks Island Landfill.
- Participation in Trent River Mouth Sediments Investigation Steering Committee (DOE/MOE /BQ-RAP).
- Monitoring/support actions related to unauthorized actions at Bakelite site.

D.4 Toxic Contaminants Issue Related Tasks for 2006-2010

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Based on current understanding of the toxic contaminants issue, the key tasks identified for action during the 2006-2010 Work Plan are listed below and summarized with schedules for completion in Table D. It should be noted that the work in progress during 2005/06 might identify tasks in addition to those listed below that will need to be undertaken prior to 2010.

- | | |
|---------|---|
| Task D1 | Review and revise as required, the toxic contaminants related delisting targets. |
| Task D2 | Complete scientific interpretation and reporting for all toxic contaminants related tasks initiated in 2005. |
| Task D3 | If necessary, undertake additional investigation identified from 2005 investigations. |
| Task D4 | Assess status of compliance of municipal water treatment plants with respect to drinking water standards. |
| Task D5 | Undertake young-of-year fish contaminants sampling and reporting. |
| Task D6 | Undertake sport fish contaminants sampling and reporting. |
| Task D7 | Design sampling program to secure data required to address deficiencies (i.e. type, parameters, quantity, detection limits) in application of Bay of Quinte contaminants fate and transport model. (Most particularly for STP, storm water and industrial discharges) |

- Task D8 Secure the contaminants data identified in Task D7.
- Task D9 Re-run the Bay of Quinte contaminants fate and transport model, if necessary.
- Task D10 Continue to implement storm water management policy .
- Task D11 Advance development/updating of PPCPs for Bay of Quinte municipalities.
- Task D12 Promote implementation of all municipal PPCPs.
- Task D13 Monitor progress of toxic contaminants projects (Deloro, Bakelite, Meyer's Pier, Trent River mouth).
- Task D14 Update implementation status of Stage 2 recommendations 15, 24, 26, 27, 28, 29, 43, 44, 50 and 58.
- Task D15 Undertake biological assessment of sediment contamination in Lower Trent River utilizing BEAST methodology and produce report of findings.

Table D Tasks, Agency Roles and Schedules for Toxic Contaminants Issue in 2006-2010 Work Plan

Task	IBU	Lead Role	Support Role	06/07	07/08	08/09	09/10
D1. Review and revise as required toxic contaminants related IBUs	1,4,6,7,9	MOE, DOE	DFO, BQ-RAP	xxxx			
D2. Complete scientific interpretation and reporting	1,4,6,7,9	MOE, DOE	,BQ-RAP	xxxx			
D3. If necessary undertake additional studies identified from 2005 ...	1,4,6,7,9	MOE, DOE	BQ-RAP		xxxx		
D4. Assess status of municipal WPS with respect to drinking water standards	9	MOE	DOE	xxxx			
D5. Undertake young-of-year fish contaminants sampling and...	1	MOE	MNR		xxxx	xxxx	
D6. Undertake sport fish contaminants sampling and...	1	MOE	MNR		xxxx	xxxx	
D7. Design sampling program to secure data required for contaminant fate/ transport ...	1,4,6,7,9	BQ-RAP /IM			xxxx		
D8. Secure data required to run fate and transport model.	1,4,6,7,9	MOE	BQ-RAP, DOE		xxxx		
D9. Re-run contaminants fate and transport model.	1,4,6,7,9	BQ-RAP/IM	MOE, UofT			xxxx	
D10. Continue to implement storm water mgt policy...	1,4,6,7,9	CAs		xxxx	xxxx	xxxx	xxxx
D11. Advance development - updating of PPCPs. for Bay of Quinte municipalities. .	1,4,6,7,9	MOE, CA	BQ-RAP, GLSF	xxxx	xxxx		
D12. Promote implementation of PPCPs.	1,4,6,7,9	MOE, CA	BQ-RAP, GLSF	xxxx	xxxx	xxxx	xxxx
D13. Monitor progress of cleanup projects ...	1,4,6,7,9	RC	BQ-RAP/TS	xxxx	xxxx	xxxx	xxxx
D14. Update implementation status of Stage 2 recommend #s 15, 24,26,	1,4,6,7,9	BQ-RAP	BQ-RAP / TS	xxxx	xxxx	xxxx	xxxx

27, 28, 29, 43, 44, 50, 58..		IM					
D15. Undertake biological assessment of sediment contamination at mouth of lower Trent River ... and produce report.	6	DOE MOE		xxxx	xxxx		

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SECTION E Bacterial Contamination Issue

E.1 Background

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The current status of the Bay of Quinte bacteriological contaminant issue is uncertain. In 2003 the Implementation Office produced a report dealing with an assessment of Health Unit beach posting information from 1988 to 2002 for eight public beaches located on the Bay of Quinte or its inflowing tributaries. During this fifteen-year period of record, operating authorities abandoned maintenance of the Forest Mills, Newburgh, Bain Park, Zwick's Island and Riverside Park public beaches. Of the remainder, the Health Unit data revealed chronic contamination problems at the Frankford Park and Centennial Park (Deseronto) beaches with no apparent trends towards achievement of the IBU # 10 delisting target. The sources of contamination at these two beaches remain undetermined.

E.2 Bay of Quinte Bacterial Contamination Related IBUs

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The only bacterial contamination related IBU is that of beach postings (IBU # 10).

E.3 Bacterial Contaminants Issue Tasks In Progress During 2005/06

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- Implementation of the Bay of Quinte storm water management policy. (CAs, BQ-RAP)
- Advance development of PPCPs for Napanee, Deseronto and Picton. (QCA, BQ-RAP)

E.4 Bacterial Contaminants Related Tasks for 2006-2010

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Of all of the Bay of Quinte RAP issues, beach postings appears to be the most perplexing with respect to bacterial sources and municipal intentions for beach management. A concerted effort over the course of the 2006-2010 Work Plan will be required to ensure that the necessary interventions have been carried out and the delisting targets revised and met. Table E provides a summary of the recommended bacteriological contamination related tasks and schedules. The existing delisting targets for IBU # 10 are provided in Appendix B.

- | | |
|---------|---|
| Task E1 | Continue to implement Bay of Quinte storm water management policy for new coastal development. |
| Task E2 | Advance development of PPCPs for Napanee, Deseronto and Picton and update PPCPs for Belleville and Quinte West. |
| Task E3 | Promote implementation of PPCPs for Napanee, Deseronto, Picton, Belleville and Quinte West. |

- Task E4 Facilitate review of delisting targets for the bacterial contamination related IBUs.
- Task E5 Determine intent of operating authorities for long-term operation and management of bathing beaches within their jurisdiction.
- Task E6 Determine sources of bacterial contamination affecting those public beaches with chronic posting problems that are designated by an operating authority for continued long term operation.
- Task E7 Promote actions identified as necessary to reduce bacterial contamination and posting of beaches that are designated by an operating authority for continued long term operation.
- Task E8 Assess status of beach postings following development/refinement of delisting targets.

Table E Tasks, Agency Roles and Schedules for the Bacterial Contamination Issue in 2006-2010 Work Plan

Task	IBU	Lead Role	Support Role	06/07	07/08	08/09	09/10
E1. Continue to implement storm water policy...	10	CAs		xxxx	xxxx	xxxx	xxxx
E2. Advance development of PPCPs.	10	MOE QCA	BQ-RAP GLSF	xxxx	xxxx		
E3. Promote implementation of PPCPs	10	MOE QCA	BQ-RAP GLSF	xxxx	xxxx	xxxx	xxxx
E4. Facilitate review of delisting targets for bacterial...	10	MOE	BQ-RAP	xxxx			
E5. Determine intent of operating authorities for long term management of bathing beaches ...	10	BQ-RAP		xxxx			
E6. Determine sources of bacti contamination affecting beaches with chronic postings...	10	MOE			xxxx		
E7. Promote actions to reduce beach postings...	10	MOE			xxxx	xxxx	xxxx
E8. Assess status of beach postings following...	10	MOE				xxxx	

SECTION F Fish and Wildlife Issue

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F.1 Background

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Loss of fish and wildlife habitat was identified in the BQ-RAP Stage 1 and 2 reports as being a significant issue affecting the Bay of Quinte ecosystem. The causative factors for loss of habitat have been many. Some of the issues identified in the Stage 1 and 2 reports were: infilling and degradation of coastal wetlands; loss of rooted, submergent aquatic vegetation; impacts of water level regulations; loss and degradation of natural shorelines, and invasions by non-indigenous species. While many of these obtrusions are irreversible, the BQ-RAP has tried to avert further anthropogenic destruction of habitat through education of waterfront property owners and the initiation of shoreline and wetland rehabilitation projects. At various times in BQ-RAP history, the scope of the fish and wildlife habitat initiatives included the entire watershed. More recently, the focus has shifted to the development of fish and wildlife habitat management plans for the coastal areas of the bay. These plans will also support fish and wildlife population management and objectives.

F.2 Bay of Quinte Fish and Wildlife Related IBUs

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The fish and wildlife related IBUs are listed below. The existing delisting targets for fish and wildlife habitat appear in Appendix B.

- IBU # 3 - Degradation of fish and wildlife populations
- IBU #14 - Loss of fish and wildlife habitat

F.3 Fish and Wildlife Related Tasks in Progress During 2005/06

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During 2005/06, a number of key fish and wildlife habitat related tasks were initiated. The outcomes of these investigations/actions were not available in time to be considered in the preparation of this work plan. It is possible these tasks, when completed, will identify the need for additional investigations/actions during the period of this 2006 - 2010 Work Plan. The tasks in progress during 2005/06 included the following:

- Development of a fish habitat management plan. (BQ-RAP/DFO/MNR/GLSF/CAs)
- Development of a plan to address wildlife related impairments. (BQ-RAP/MNR/EC-CWS/DFO/GLSF)
- Development of a Natural Heritage Report with the Mohawks of the Bay of Quinte. (BQ-RAP/MBQ/DOE/GLSF)
- Preparation of a Bay of Quinte tributaries fish migration barrier identification and assessment report. (BQ-RAP/GLSF)

- Commissioning an inventory, annotated bibliography and subsequent gap analysis of all wetlands publications, works, and databases pertaining to coastal waters of the Bay of Quinte. (BQ-RAP/MNR)
- Continuation of the Community Wildlife Monitoring Program. (BQ-RAP/GLSF)
- Completion of a Natural Heritage Report for the Municipality of Greater Napanee. (BQ-RAP/CAs/GLSF)
- Investigation of the applicability of Durham Region Coastal Wetlands Monitoring Program for use in Bay of Quinte coastal wetlands. (EC-CWS, GLSF)
- Analysis of loss of Bay of Quinte coastal wetlands. (EC-CWS)
- Habitat assessment of Prince Edward County watershed draining to the Bay of Quinte using Environment Canada’s “How Much Habitat is Enough?” methodology. (BQ-RAP/MNR/QCA)
- Completion of a fish habitat classification model for the upper and middle bays. (GLLFAS)
- Completion of an assessment of submerged macrophytes, Bay of Quinte. (GLLFAS)

F.4 Fish and Wildlife Tasks for 2006-2010

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Fish and wildlife issues are being dealt with by working groups consisting of representatives from MNR, DFO, DOE, CAs and the BQ-RAP Implementation Office, with coordination being provided by a biologist assigned to the BQ-RAP Implementation Office. Additional tasks might be identified from the findings of the fish and wildlife work initiated in 2005/06. Also, some of the tasks recommended below might become part of the fish habitat management and wildlife impairment strategies being developed in Task F2. The recommended fish and wildlife tasks are listed below and summarized along with schedules for completion in Table F.

- | | | |
|------|----|--|
| Task | F1 | Development of delisting targets and status assessments for fish and wildlife related IBUs, 3 and 14. |
| Task | F2 | Complete development of and implement the fish habitat management plan and wildlife impairment plan to address the loss of fish and wildlife habitat and degradation of fish and wildlife populations (IBUs 3 and 14). |
| Task | F3 | Facilitate and coordinate, when required, effects monitoring for BQ-RAP recommended habitat restoration/rehabilitation projects. |
| Task | F4 | Advocate protection and restoration of fish and wildlife habitat through public outreach and education activities and by promoting existing funding programs. |

- Task F5 Assist in development of AOC natural recovery phase justifications for IBUs 3 and 14.
- Task F6 Assist municipalities with the identification of sensitive coastal fish and wildlife habitats and encourage municipal planning actions to protect and conserve these sensitive resources.
- Task F7 Assist in coordination of the Community Wildlife Monitoring Program; review and refine the program to focus its efforts on coastal wildlife communities; and assess recruitment and retention of volunteers.
- Task F8 Provide ongoing integration of BQ-RAP habitat initiatives with management direction, including the Bay of Quinte Fisheries Management Plan and Lake Ontario Fish Community Objectives.
- Task F9 Assist in the development of the Fisheries Management Plan for the Bay of Quinte.

Table F Tasks, Agency Roles and Schedules for the Fish and Wildlife Issue in 2006-2010 Work Plan

Task	IBU	Lead Role	Support Role	06/07	07/08	08/09	09/10
F1. Development of status assessments and delisting targets for fish and wildlife related IBUs	3,14	BQ-RAP	MNR, DFO, DOE, GLSF,	xxxx			
F2. Complete development of fish habitat mgmt plan and wildlife impairment plan....	3,14	BQ-RAP, QCA	MNR, DFO, DOE, GLSF	xxxx			
F3. Facilitate & coordinate effects monitoring on habitat rehabilitation projects.	3,14	QCA	MNR, DFO, BQ-RAP, GLSF	xxxx	xxxx	xxxx	xxxx
F4. Advocate protection and restoration of fish and wildlife habitat	3,14	QCA	MNR, DFO, BQ-RAP, GLSF	xxxx	xxxx	xxxx	xxxx
F5. Assist in development of natural recovery status justifications for IBUs 3 and 14	3,14	BQ-RAP	MNR, DFO, CA DOE			xxxx	xxxx
F6. Assist municipalities in identifying sensitive fish and wildlife habitats and	3,14	CAs DFO	MNR,	xxxx	xxxx	xxxx	xxxx
F7. Assist in coordination .. refocusing ... recruitment ..Community Wildlife Monitoring Program	3,14	QCA	BQ-RAP, GLSF	xxxx	xxxx	xxxx	xxxx
F8. Provide ongoing integration of fish habitat and fisheries mgmt plans.	3,14	QCA	MNR, DFO, BQ-RAP	xxxx	xxxx	xxxx	xxxx
F9. Assist in development of Fisheries Management Plan.	3	MNR	DFO, BQ-RAP, Others	xxxx	xxxx		

Section G BQ-RAP Implementation Office

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G.1 BQ-RAP Implementation Office

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Over the next four years, as the Quinte RAP moves towards a natural recovery phase, the challenges facing the BQ-RAP Implementation Manager and Implementation Office staff will increase significantly. It is essential that this be recognized and imperative that the RAP Implementation Office be allocated the human and financial resources required to deliver its assigned functions under this Work Plan. In order to implement the tasks outlined in this 2006-2010 Work Plan, it is recommended that the human resources of the Remedial Action Plan Office include:

- 1) an implementation manager to guide and direct implementation of the 2006-2010 Work Plan,
- 2) a communications and consultations coordinator to develop and deliver communications and consultation program for the transition of the Area of Concern to a natural recovery phase; provide communications advice to the Restoration Council and undertake media relations,
- 3) a technical staff position to assist the implementation manager in advancing to the natural recovery phase, creating its justification documentation, and defining and promoting the required natural recovery period monitoring process.

G.2 BQ-RAP Implementation Manager

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The work load identified in this plan in order to reach the AOC natural recovery phase for the Bay of Quinte in 2010 places an increased burden and level of responsibility on the BQ-RAP Implementation Manager. In order to achieve the 2010 goal of attaining the natural recovery phase for the AOC, it will be necessary for the Implementation Manager to aggressively guide and direct the Work Plan to its completion. In order to do so, the BQ-RAP Implementation Manager will require the support of the Restoration Council and both the federal and provincial funding agencies.

G.2.1 Implementation Manager Tasks for 2006 to 2010

In addition to the roles and responsibilities outlined in the Implementation Manager's position description, the recommended tasks to be carried out by the BQ-RAP Implementation Manager as part of the Restoration Council's 2006-2010 Work Plan include the following:

- Task G1 Prepare annual reports and budgetary statements for submission to signatories of the Restoration Council's operating Memorandum of Understanding and funding agreements.
- Task G2 Facilitate building of BQ-RAP funding and implementation partnerships, prepare funding submissions, provide budgetary control and supervision of approved projects.
- Task G3 Promote collection of adequate ecosystem data to allow comparison with all IBU delisting targets.
- Task G4 Encourage development of a comprehensive program in partnership with member agencies to monitor natural ecosystem restoration throughout duration of the AOC's natural recovery phase.
- Task G5 Coordinate review of all delisting targets and produce revised delisting criteria report.
- Task G6 Coordinate development of updated report for Canada Ontario Agreement on status of Bay of Quinte IBUs.
- Task G7 Investigate and report on implementation status of Stage 2 recommendations numbers 15, 24, 26, 27, 28, 29, 43, 44, 50 and 58.
- Task G8 Determine intent of operating authorities for long-term operation and management of bathing beaches within their jurisdiction.
- Task G9 Coordinate development of a summary report of BQ-RAP Stage 3 interventions to satisfy criterion for natural recovery status.
- Task G10 Coordinate development of a "*Time to Celebrate*" justification report for moving the Bay into a natural recovery phase.

Table G.1 BQ-RAP Implementation Manager Tasks in the 2006-2010 Work Plan

Task	IBU	Lead Role	Support Role	06/07	07/08	08/09	09/10
G1. Prepare annual reports and budgetary statements ...	All	IM	BQ-RAP TS	xxxx	xxxx	xxxx	xxxx
G2. Facilitate building funding and implementation partnerships...	All	IM	BQ-RAP COM/TS	xxxx	xxxx	xxxx	xxxx
G3. Promote collection of data required...	All	IM	BQ-RAP TS	xxxx	xxxx	xxxx	xxxx
G4. Encourage development of monitoring program for period of natural recovery...	All	IM	BQ-RAP TS, MOE, DOE, MNR			xxxx	xxxx
G5. Coordinate review of delisting targets and produce report...	All	IM	BQ-RAP TS	xxxx			
G6. Coord development of update report on status of IBUs ...	All	IM	BQ-RAP TS		xxxx		
G7. Update implementation status of Stage 2 recommendations 15, 24,26, 27, 28, 29, 43, 44, 50, 58.	1,4,6 7,8,9 10,11, 13	IM	BQ-RAP TS	xxxx	xxxx		
G8. Determine intent of operating authorities for long-term operation and management of bathing beaches within their jurisdiction.	10	IM	BQ-RAP TS	xxxx			
G9. Coord of summary report of Stage 3 interventions ...	All	IM	BQ-RAP TS			xxxx	xxxx
G10. Coord of justification report for natural recovery status...	All	IM	BQ-RAP TS				xxxx

G.3 Implementation Office - Communications and Consultations

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The BQ-RAP Restoration Council needs a communications and consultations coordinator. The position is vital to achievement of the Restoration Council 2010 goal. It carries the challenge of building the Bay of Quinte community’s interest in, understanding of, and support for completion of the Bay of Quinte Remedial Action Plan. The position is responsible for development and delivery of the BQ-

RAP Restoration Council's communications and consultations programs. The position will provide ongoing strategic communications advice and support to the Implementation Manager, Co-Chairs, Restoration Council and technical support staff and providing logistical support for events such as advertising, hall rentals, open house displays, press releases and associated tasks.

G.3.1 Communications and Consultations Coordinator Tasks for 2006-2010.

In addition to the duties inherent in a communications and consultations position, the recommended tasks to be carried out by the BQ-RAP communications and consultations coordinator as part of the Restoration Council's 2006-2010 Work Plan are to:

- Task G13 Update as required and deliver the Restoration Council's ongoing information and communications strategy/program.
- Task G14 Develop and implement a consultation strategy to secure public and stakeholder support for revised delisting targets.
- Task G15 Support delivery of communications and consultation strategy to secure agency, stakeholder and public support for fish and wildlife habitat management plans, the phosphorus management strategy any other implementation strategies and work plan tasks as required.
- Task G16 Develop and deliver a comprehensive communications and consultation program to inform, involve and secure support of the public, agency partners and stakeholders for the move to the natural recovery phase.
- Task G17 Develop and deliver a communications and celebrations strategy for moving the BQ Area of Concern to a natural recovery phase.

Table G.2 Tasks, Implementation Office, Communications and Consultations Coordinator in 2006-2010 Work Plan

Task	IBU	06/ 07	07/ 08	08/ 09	09/ 10
G13. Update and deliver ongoing information and communications strategy...	All	xxxx	xxxx	xxxx	xxxx
G14. Develop and implement consultation strategy for revised delisting targets.	All	xxxx	xxxx		
G15. Support communications/consultations for fish and wildlife habitat management plans etc...	3, 14	xxxx	xxxx	xxxx	xxxx
G16. Develop and deliver communications consultations program for move of AOC to natural recovery phase.	All		xxxx	xxxx	xxxx
G17. Develop and deliver celebration strategy for move to natural recovery phase.	All			xxxx	xxxx

G.4 Implementation Office - Technical Support Staff Tasks for 2006-2010

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All the tasks in Table G1 assigned to the BQ-RAP Implementation Manager as lead also identify the technical support staff person in a “support role”. Other tasks that technical staff person will be helping to facilitate (support role) include the following:

- Advance development of PPCPs. (Task C14, D11, E2, support role)
- Promote implementation of PPCPs. (Task C 5, D12, E3, support role)
- Determine intent of operating authorities for long-term management of bathing beaches. (Task E5, G8, support role)
- Advocate protection and restoration of fish and wildlife habitat. (Task F5, support role)
- Assist with the development of natural recovery phase justifications for IBUs 3 and 14. (Task F6, support role)
- Assist with report on implementation status of Stage 2 recommendations 15, 24, 26, 27, 28, 29, 43, 44, 50 and 58. (Task D14, G7, support role)

APPENDIX A
ESTIMATED RESTORATION COUNCIL
AND
BQ-RAP IMPLEMENTATION OFFICE COSTS
2006-2010

The estimated costs to manage the BQ-RAP programs and implement all of the recommended BQ-RAP Restoration Council and Implementation Office tasks in this 2006-2010 Work Plan are provided below. The estimates are based on historical operating costs and previous expenditures for consultant contracts.

The Restoration Council and Implementation Office operational costs include but are not limited to: a) the salaries and benefits for BQ-RAP staff; b) operating expenses such as hosting meetings, accommodations, travel costs, leasing, internet services, telephone, teleconferencing, office supplies and postage; c) funding tasks contracted out and d) expendables associated with the BQ-RAP communications and consultations strategies and activities.

The recommended level of staffing to ensure completion of the substantial work load identified for the BQ-RAP Implementation Office as its part of the 2006-2010 Work Plan is three persons, viz. an implementation manager, a technical officer and a communications/consultations coordinator. Fiscal 06/07 will, however, be limited to a two person Implementation Office

Item	06/07	07/08	08/09	09/10	Total
Salaries & Benefits	103K*	159K	167K	176K	605K
Operating Expenses					
Operating costs (Restoration Council)	4K	5K	6K	6K	21K
Operating costs (Implementation Office and staff)	21K	27K	30K	33K	111K
Communications	24K	24K	32K	36K	116K
Consultations	8K	18K	18K	18K	62K
Celebrations events	-	-	-	6K	6K
Hosting technical symposium	-	-	-	5K	5K
Service Contracts					
Coordinate review of delisting targets .	5K	-	-	-	5K
Update status report on IBUs.	-	25K	-	-	25K
Produce summary report of Stage 3 interventions.	-	-	-	35K	35K
Produce AOC in recovery phase justification report .	-	-	-	50K	50K
Totals	165K	258K	253K	365K	1041K

* Staff salaries and benefits for 06/07 are for a two person Implementation Office but for the remaining years are for a three person office.

APPENDIX B

EXISTING IMPAIRED BENEFICIAL USE

DELISTING TARGETS

BQ-RAP IBU Delisting Targets

IBU # 1 - Restrictions on Fish and Wildlife Consumption

- Using the information and databases reported in the 1993 Bay of Quinte Stage 2 Report, demonstrate a positive downward trend and change in contaminant levels in fish in the Bay of Quinte for those contaminants which are:
- sourced in the Bay of Quinte
- identified in the 1999-2000 Guide to Eating Ontario Sport Fish as exceeding safe consumption limits...that is mercury, PCB, pesticides and dioxin
- identified in the 1999-2000 Guide to Eating Ontario Sport Fish as contaminants of concern in the Bay of Quinte area such as polynuclear aromatic hydrocarbons (PAH), other metals, chlorinated phenols, chlorinated benzenes and other persistent toxic contaminants

How the Target will be measured

- Demonstrate the frequency of consumption restrictions in the upper and middle Bay of Quinte is reduced so that the frequency is comparable to the “less contaminated” sampling area in the Otonabee River upstream of Peterborough in the Bay of Quinte watershed or a comparable Lake Ontario zone as defined in the Guide to Eating Ontario Sport Fish. The Otonabee River sampling location is the “least contaminated” sampling area in the Bay of Quinte watershed reported in the 1999-2000 Guide to Eating Ontario Sport Fish.
- Demonstrate contaminant levels in sentinel species such as young-of-the-year yellow perch and spottail shiners at upper Bay of Quinte sites do not exceed background levels (such as levels measured in Lake Ontario) that have been or could be impacted by local or regional sources

IBU # 3 - Degradation of Fish and Wildlife Populations

Demonstrate that key fish and wildlife species—including walleye, bass and pike -- are present in numbers consistent with a stable, diverse and healthy aquatic ecosystem

Demonstrate that key indicator species for upland wetlands and forests are present and in sufficient numbers to be self-sustaining

How the Target will be measured

- Demonstrate that key fish and wildlife species are present in numbers consistent with an unimpaired ecosystem
- Demonstrate that walleye, bass and pike populations are all self-reproducing and that none of these species dominates the fish community
- Demonstrate that targeted fish and wildlife species are healthy, abundant and self-sustaining in the Bay of Quinte area given the impact and influence of key factors such as habitat availability, habitat features (e.g., impacts of eutrophication, impacts of zebra mussels), human interactions (e.g., fish harvesting) and other factors (e.g., toxic contaminants)
- Through wildlife monitoring programs, demonstrate that key indicator species for coastal and upland wetlands and existing forests are present and in significant numbers to be self-sustaining.

IBU # 4 - Fish Tumours and Other Deformities

Demonstrate no environmental significant difference between the type, frequency and occurrence of tumours in Bay of Quinte walleye and an unimpaired Great Lakes site with similar physical and chemical characteristics as the Bay of Quinte OR an unimpaired site outside the Great Lakes basin with similar population characteristics as the Bay of Quinte

How the Target will be measured

- Type, frequency and occurrence of tumours in Bay of Quinte walleye does not exceed significantly the type, frequency and occurrence of tumours in walleye of similar age and comparable population in the selected control site...that is, the background and normal levels of type, frequency and occurrence of tumours in fish elsewhere.

IBU # 6 - Degradation of Benthos

Using 1977-84 as the “base-time period”, demonstrate a positive trend and change in the benthic macroinvertebrate community structure of the Bay of Quinte.

How the Target will be measured

- Key “pollution sensitive” species absent in earlier community surveys are present and increasing in abundance in the Bay of Quinte
- Type and quality of habitat plus benthic communities present, as determined by a Benthic Assessment of Sediment (BEAST) assessment process of sediment characterisation, be present to permit a presence and abundance of “pollution sensitive” benthic macroinvertebrate species
- Measure increased species and community diversity with the presence of various key benthic macroinvertebrate groups using an Index of Biotic Integrity methodology

IBU # 7 - Restrictions on dredging activities

Using the information and databases reported in the 1993 Bay of Quinte RAP Stage 2 Report or relevant sources of information from other studies as the base year, demonstrate a positive trend in sediment quality for contaminants at depth for those areas that are being dredged or may be considered for dredging.

- If contaminants do exist at depth and removal of overlying sediments could expose these contaminants to the environment, the zone will be designated as contaminated and, as such, any dredging activity must include measures to protect the environment within the dredging zone, adjacent to the dredging zone and at the designated disposal site for the dredged material.

How the Target will be measured

- For those areas that are being or may be considered for dredging measure zero exceedences due to local input sources of Provincial Dredge Spoil Disposal Guidelines (PDSDG) for the parameters listed in the Bay of Quinte RAP Stage 2 Report at depths for those areas that are being dredged or may be considered for dredging.
- For those areas that are being or may be considered for dredging, demonstrate the number of Provincial Sediment Quality Guidelines (PSQG) “Lowest Effect Limit” exceedences has been reduced from the numbers reported during the base year period for contaminants at depth.

IBU #8 - Eutrophication or undesirable algae

Demonstrate a 25% reduction in total phosphorus concentrations in the upper Bay of Quinte.

Demonstrate a 40% reduction in algae levels in the upper Bay of Quinte.

Using 1986 to 1994 as a “base year period”, increase area of submerged aquatic macrophytes so that 30% of the upper Bay of Quinte has macrophyte coverage of more than 50%...that is, from about 38 km² to 45 km² or about a 20% increase in the area of submerged aquatic macrophytes in the upper Bay of Quinte.

How the Target will be measured

- Reduce the average concentration of total phosphorus from 40 µg/L to 30 µg/L in the upper Bay of Quinte.
- Demonstrate a change in total phytoplankton biomass such that the average pre-1990 algae density of 7.0-8.0 mm³/L to is reduced to 4.0-5.0 mm³/L in the upper Bay of Quinte.
- Measure positive changes in distribution and areal coverage, species composition, stem density and frequency, and biomass at the appropriate Trenton, Belleville and Big Bay sampling stations in the upper Bay of Quinte.

IBU # 9 - Restrictions on Drinking Water or Taste and Odour Problems

Using the period between 1989 and 1994 as a base period, demonstrate a positive trend or change in the taste and odour of Bay of Quinte drinking water

Demonstrate that the Ontario Drinking Water Surveillance Program (ODWSP) maximum acceptable concentrations (MAC) for treated drinking water have been met and exceeded.

Record no exceedences of safe levels of trihalomethanes (THM) in drinking water at the Ontario Drinking Water Surveillance Program (DWSP) at the Bayside, Belleville and Deseronto water treatment plant sampling locations.

How the Target will be measured

- A reduction in algae levels from the base year levels as anticipated by reduced phosphorus concentrations in the upper Bay of Quinte in the raw water intake at the Belleville water treatment plant.
- Fewer taste and odour complaints compared to the base year period in the Belleville, Deseronto and Bayside drinking water supplies.
- A reduction in chemical usage levels from the base year levels as anticipated by reduced phosphorus concentrations in the upper Bay of Quinte at the Belleville, Deseronto and Bayside water treatment plants.
- No ODWSP MAC exceedences reported since 1993. No significant increase in trihalomethane (THM) levels in Bay of Quinte drinking water from the levels reported in the 1993 Bay of Quinte Stage 2 Report.
- No safe level exceedences of THM in Bay of Quinte drinking water at the noted DWSP sampling sites.

IBU # 10 - Beach Closures

Using 1989-1994 as the base year period, demonstrate improved bacteriological water quality conditions for the beaches at Forest Mills, Frankford, Kingsford and Newburgh.

Using 1989-1994 as the base year period, demonstrate progress toward improving bacteriological water quality conditions for the beaches at Riverside Park and Zwick's Island (Belleville).

How the Target will be measured

- Significant reduction in beach postings with a trend toward zero beach postings at Forest Mills, Frankford, Kingsford and Newburgh beaches.
- Significant reduction in beach postings at Riverside Park and Zwick's Island, or
- Closure and relocation plans to place the beaches in an urban area suitable for human access and recreational purposes are developed and

endorsed by the community for the Riverside Park and Zwick's Island beaches.

IBU # 11 - Degradation of Aesthetics

Demonstrate a positive trend to improved aesthetics using the period between 1990 and 1994 (the pre-zebra mussel period) as the base year.

How the Target will be measured

- Demonstrate the frequency, duration and severity of algae blooms have been reduced
- Measure a seasonal mean secchi disk of 1.3 metres with an anticipated summer secchi disk of 1.0 metres

IBU # 13 - Degradation of phytoplankton and zooplankton populations

Using the pre-zebra mussel invasion period 1990-1994 as a "base year", demonstrate a positive trend and change in the phytoplankton and zooplankton populations in the upper Bay of Quinte

Demonstrate that the upper Bay of Quinte phytoplankton and zooplankton community structure does not diverge significantly from an unimpaired Great Lakes/control site of comparable physical and chemical characteristics

How the Target will be measured

- Demonstrate a positive change in phytoplankton species composition with a decrease in nuisance and eutrophic indicator species (e.g., blue-green algae *Anabaena*)
- Associated with the Bay of Quinte RAP phosphorus reduction targets for the upper Bay of Quinte, demonstrate that chlorophyll a concentrations are about 12 ug/L in the upper Bay of Quinte without the presence of zebra mussels (with zebra mussel, a further 2-3 ug/L chlorophyll a reduction should be anticipated)
- Demonstrate that the ratio of calanoids to cladoceran and cyclopod is indicative of a healthy zooplanktonic community based on the phosphorus concentrations in each of the upper, middle and lower Bay of Quinte

- Measure a trend toward a more balanced zooplankton community shown as a range of mean individual sizes between 0.7 and 0.9 mm

IBU # 14 - Loss of Fish and Wildlife Habitat

To the greatest extent possible, protect the quantity, function, and diversity of significant natural features as identified in Natural Heritage Strategies (NHS) completed for partnering municipalities and First Nations fronting on the Bay of Quinte

To the greatest extent possible, protect and restore fish habitat in the Bay of Quinte

Encourage municipalities and broad public and sectoral support/advocacy for the Natural Heritage Strategies and Fish Habitat Management Strategy availability, findings and recommendations

Establish a self-sustaining, volunteer, community-based wildlife monitoring program for the Bay of Quinte area

How the Target will be measured

| The use of the Natural Heritage Strategies will be monitored with respect to municipal planning

The Natural Heritage Strategies will be completed

The Ontario Ministry of Natural Resources Fish Community Objectives will be adopted, and actions taken to monitor achievement of the objectives

A Bay of Quinte Fisheries Habitat Management Strategy will be completed

An education and awareness program will be developed and implemented to gain support for the Natural Heritage Strategies and the Fish Habitat Management Strategy

A stewardship program will be developed and delivered for the protection, creation and rehabilitation of fish habitats identified in the Natural Heritage Strategies and the Fish Habitat Management Strategy

A communications plan will be developed and implemented

A strategy will be developed and implemented for recruiting and coordinating volunteers for existing “wildlife watchers” programs (e.g., Marsh Monitoring Program)

- Findings will be reported annually

