

1989-1990  
ANNUAL  
REPORT

ST. LAWRENCE ACTION PLAN

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**ENVIRONMENT CANADA**  
CONSERVATION AND PROTECTION  
REGIONAL OFFICE  
1141 DE L'ÉGLISE ROAD  
6<sup>TH</sup> FLOOR  
P.O. BOX 10100  
SAINTE-FOY PQ  
G1V 4H5  
TELEPHONE (418) 648-4512  
FAX (418) 649-6213

CANADIAN PARKS SERVICE  
3 BUADE STREET  
P.O. BOX 6060, HAUTE-VILLE  
QUEBEC CITY PQ  
G1R 4V7  
TELEPHONE (418) 648-4042  
FAX (418) 648-4234

**INDUSTRY, SCIENCE AND  
TECHNOLOGY CANADA**  
NATIONAL COORDINATION OFFICE ETPD  
ENVIRONMENTAL INDUSTRIES  
AND PROJECTS DIVISION  
235 QUEEN STREET  
OTTAWA ON  
K1A 0H5  
TELEPHONE (613) 954-3225  
FAX (613) 954-1894

**FISHERIES AND OCEANS CANADA**  
CHAMPLAIN MARITIME STATION  
P.O. BOX 15500  
QUEBEC CITY PQ  
G1K 7Y7  
TELEPHONE (418) 648-2509  
FAX (418) 648-4470

*MINISTÈRE DE  
L'ENVIRONNEMENT DU QUÉBEC*  
INDUSTRIAL SECTOR  
3900 MARLY STREET  
6<sup>TH</sup> FLOOR  
SAINTE-FOY PQ  
G1X 4E4  
TELEPHONE (418) 643-7860  
FAX (418) 643-7812

*SOCIÉTÉ QUÉBÉCOISE  
D'ASSAINISSEMENT DES EAUX*  
1055 RENÉ-LÉVESQUE BOULEVARD EAST  
10<sup>TH</sup> FLOOR  
MONTREAL PQ  
H2L 4S5  
TELEPHONE (514) 873-7411  
FAX (514) 873-7879

*MINISTÈRE DU LOISIR,  
DE LA CHASSE ET DE LA PÊCHE*  
SPECIES AND HABITAT MANAGEMENT  
150 SAINT-CYRILLE BOULEVARD EAST  
5<sup>TH</sup> FLOOR  
QUEBEC CITY PQ  
G1R 4Y1  
TELEPHONE (418) 644-2823  
FAX (418) 643-3330

*MINISTÈRE DE L'INDUSTRIE,  
DU COMMERCE ET DE LA  
TECHNOLOGIE*  
TECHNOLOGY AND MARKET DEVELOPMENT  
710 PLACE D'YOUVILLE  
3<sup>RD</sup> FLOOR  
QUEBEC CITY PQ  
G1R 4Y4  
TELEPHONE (418) 643-5068  
FAX (418) 643-0221

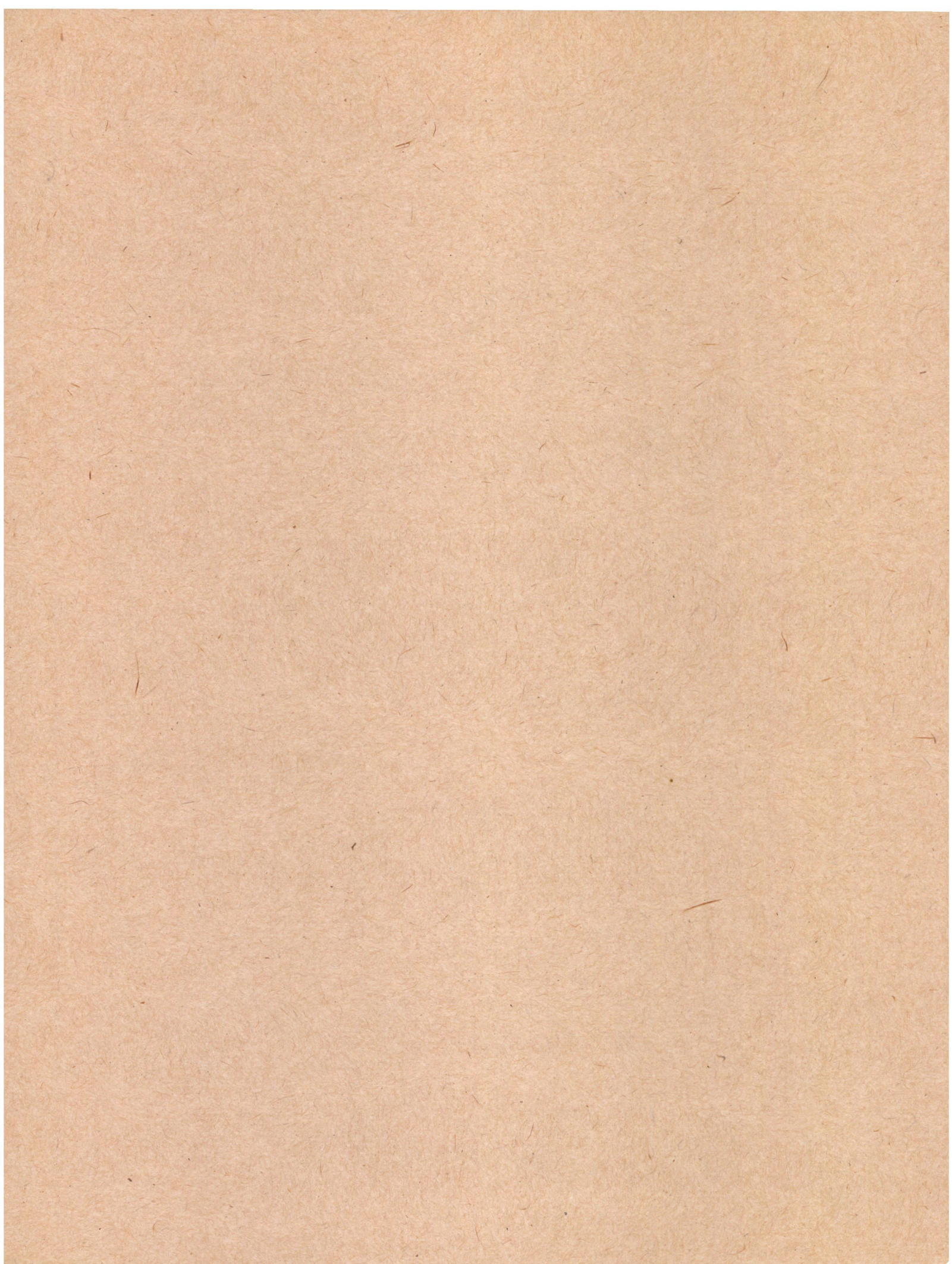
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## A WORD FROM MANAGEMENT

THE COMPLETION OF THE SECOND YEAR OF THE ST. LAWRENCE ACTION PLAN HAS BEEN CHARACTERIZED BY HARMONIZATION OF THE ACTIONS BETWEEN THE FEDERAL AND PROVINCIAL GOVERNMENTS. AS A RESULT, WORK TEAMS ARE NOW FULLY OPERATIONAL AND STRIVING TO ACHIEVE THE FIVE MAJOR OBJECTIVES OF THE ST. LAWRENCE ACTION PLAN. THESE OBJECTIVES FORM THE BASIS OF THE CANADA-QUEBEC AGREEMENT TO CLEAN UP POLLUTION AND TO CONSERVE AND PROTECT THE ST. LAWRENCE RIVER ENVIRONMENT, SIGNED IN JUNE 1989. THESE FIVE OBJECTIVES ARE:

- TO REDUCE BY 90% THE LIQUID TOXIC SUBSTANCES DISCHARGED INTO THE ST. LAWRENCE BY THE MOST POLLUTING INDUSTRIES
- TO PREPARE PLANS FOR THE RESTORATION OF CONTAMINATED FEDERAL SITES AND RESTORE WETLANDS
- TO PROTECT 5,000 ADDITIONAL HECTARES OF HABITATS AND TO CREATE A MARINE PARK

- TO DEVELOP AND IMPLEMENT SURVIVAL PLANS FOR MAMMALS, FISH, BIRDS, AMPHIBIANS, REPTILES AND VEGETATION
- TO DETERMINE THE ACTUAL STATE OF THE ST. LAWRENCE RIVER ENVIRONMENT

THIS REPORT GIVES AN UPDATE ON THE PROGRESS OF THE ACTIVITIES IN THE ACTION PLAN'S 10 PROGRAMS AND PROVIDES CLEAR EXAMPLES OF MAJOR ACCOMPLISHMENTS IN EACH.

IN THE COMING YEAR, THE CONSERVATION THEME OF THE ACTION PLAN WILL BE MORE FULLY DEVELOPED. WHILE CLEANING UP INDUSTRIAL POLLUTION AT THE 50 DESIGNATED PRIORITY SITES WILL REMAIN THE FOCUS OF OUR CONCERNS AND OUR ACTIONS, WE WILL ALSO BE STEPPING UP OUR ACTIVITIES AND INCREASING VISIBILITY FOR THE "CONSERVATION" FACET OF THE ACTION PLAN. OUR ACCENT WILL BE INCREASINGLY ON PROTECTING HABITATS AND AREAS WITH STRONG ECOLOGICAL POTENTIAL. THIS WILL REQUIRE THE CAREFUL COORDINATION OF ALL PARTNERS IN ESTABLISHING CONSERVATION AND MANAGEMENT PLANS FOR THESE AREAS, IN PARTICULAR THE REGION BETWEEN CORNWALL AND LAC SAINT-PIERRE. OUR NEXT ANNUAL REPORT SHOULD SHOW SIGNIFICANT, CONCRETE RESULTS OF THESE EFFORTS.

FOR A MORE DETAILED ACCOUNT OF EACH OF THE ACTION PLAN'S AREAS OF ACTIVITY, READERS ARE INVITED TO CONTACT ONE OF THE FOLLOWING TWO BUREAUS:

AGREEMENT BUREAU  
ENVIRONMENT CANADA  
ANALYSIS AND COORDINATION  
DIRECTORATE  
1141 DE L'ÉGLISE ROAD  
6<sup>TH</sup>FLOOR  
SAINTE-FOY PQ  
G1V 4H5  
(418) 648-4512

*SECRETARIAT À L'ENTENTE  
MINISTÈRE DE L'ENVIRONNEMENT  
DU QUÉBEC  
SOUS-MINISTÉRIAT AU MILIEU INDUSTRIEL  
3900 MARLY STREET  
6<sup>TH</sup>FLOOR  
SAINTE-FOY PQ  
G1X 4E4  
(418) 643-7860*

NOW THAT THE SECOND YEAR OF THE ST. LAWRENCE ACTION PLAN HAS BEEN COMPLETED, IT'S TIME TO ACKNOWLEDGE THE EFFORTS OF A HOST OF PARTICIPANTS — GOVERNMENTAL AND PARA-GOVERNMENTAL SERVICES, PRIVATE ENTERPRISE, UNIVERSITIES, THE SCIENTIFIC COMMUNITY, AS WELL AS INDIVIDUALS AND NON-GOVERNMENTAL ORGANIZATIONS DEDICATED TO ENVIRONMENTAL PROTECTION AND CONSERVATION.

THE AGREEMENT SIGNED BY THE GOVERNMENTS OF CANADA AND QUEBEC TO COORDINATE THEIR RESPECTIVE ENVIRONMENTAL ACTION PLANS IS ALSO WORTH NOTING, AS IT GIVES US HOPE FOR INCREASED COOPERATION AND A GREATER SENSE OF TEAMWORK FOR THE CHALLENGES AHEAD, IN THE PUBLIC INTEREST AND IN THE INTEREST OF OUR ENVIRONMENT. MORE THAN EVER ARE WE CONVINCED OF THE NECESSITY OF WORKING TOGETHER TO ACHIEVE OUR SPECIFIC GOALS OF ELIMINATING 90 PERCENT OF ALL THE LIQUID TOXIC WASTE DISCHARGED INTO THE ST. LAWRENCE BY THE 50 INDUSTRIAL PLANTS IDENTIFIED AS PRIORITY AND THE PROTECTION OF 5,000 HECTARES OF HABITATS DESIGNATED OF PRIMARY IMPORTANCE FOR FLORA AND FAUNA.

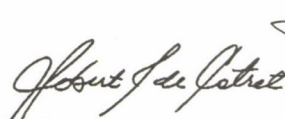
THIS COMBINATION OF EFFORTS HAS GIVEN RISE TO THE CREATION OF A FEDERAL-PROVINCIAL INTERVENTION TEAM DEDICATED TO THE CLEAN-UP OF INDUSTRIAL POLLUTION, A FIRST FOR AN ACTION PLAN OF THIS MAGNITUDE. IT IS A TRUE MODEL OF INTERGOVERNMENTAL COOPERATION IN ENVIRONMENTAL MATTERS, AND WE HOPE THAT IT MAY INSPIRE INITIATIVES OF THE SAME KIND IN OTHER AREAS WHERE OUR TWO GOVERNMENTS SHARE A COMMON INTEREST.

AS WELL, WE WOULD LIKE TO CALL ATTENTION TO THE MAJOR SUCCESS REPRESENTED BY THE SIGNING OF A SPECIFIC AGREEMENT FOR THE JOINT CREATION OF A MARINE PARK AT THE MOUTH OF THE SAGUENAY. THROUGH EFFORT AND DETERMINATION, OUR TWO LEVELS OF GOVERNMENT HAVE AGREED TO A PROPOSAL FOR A PARK, WHICH CONCEPT CONSTITUTES ANOTHER FIRST FOR CANADA. PROTECTING OUR ENVIRONMENT AFFECTS THE WELL-BEING OF EVERYONE AND QUITE NATURALLY ENCOMPASSES THE JURISDICTIONS OF BOTH LEVELS OF GOVERNMENT.

IN THIS CONTEXT, IT IS IMPORTANT TO REMEMBER THAT THE ULTIMATE GOAL OF THE ST. LAWRENCE ACTION PLAN IS TO PRESERVE THE RIVER AS A LIVING ENVIRONMENT, AND THAT THE SCALE OF THE COLLECTIVE CHALLENGE WHICH WE HAVE TAKEN ON WILL MEAN REDOUBLING OUR EFFORTS. WHILE WE HAVE NO DESIRE TO SOUND IN ANY WAY ALARMIST, WE DO BELIEVE THAT PROTECTING AND CONSERVING OUR ENVIRONMENT, PARTICULARLY THE ST. LAWRENCE AND ITS ECOSYSTEMS, WILL CONTINUE TO REQUIRE OUR IMMEDIATE AND UNDIVIDED ATTENTION.

ELSEWHERE, THE ST. LAWRENCE ACTION PLAN WILL INTENSIFY ITS ACTIVITIES TO COMPLETE CERTAIN KEY CONSERVATION PROJECTS, SUCH AS THE CREATION OF THE SAGUENAY MARINE PARK. ALL PARTNERS HAVE AGREED TO MAKE CONSERVATION THE PRINCIPAL COMMUNICATIONS THEME IN OUR THIRD YEAR, WHICH IS JUST BEGINNING, NOT ONLY TO BROADEN THE EFFECTS OF OUR WORK BUT TO INCREASE PUBLIC AWARENESS FOR WHAT WE ARE DOING AS WELL.

WE INVITE ALL CONCERNED PARTIES AND THE PUBLIC TO SHOW THEIR SUPPORT FOR THE GOALS OF THE ST. LAWRENCE ACTION PLAN BY GETTING INVOLVED. ONLY THE CLEAR EXPRESSION OF OUR COLLECTIVE WILL CAN GUARANTEE THE SUCCESS OF THIS IMPORTANT INITIATIVE. THE GOVERNMENTS OF CANADA AND QUEBEC EMBRACED THIS LONG-LASTING DEVELOPMENT WHOLEHEARTEDLY. THE ST. LAWRENCE ACTION PLAN IS AN EXAMPLE OF COOPERATION BETWEEN THE GOVERNMENTS OF CANADA AND QUEBEC TO ACHIEVE SUSTAINABLE DEVELOPMENT OBJECTIVES.



ROBERT R. DE COTRET  
FEDERAL MINISTER  
OF THE ENVIRONMENT



PIERRE PARADIS  
MINISTRE DE L'ENVIRONNEMENT  
DU QUÉBEC



GASTON BLACKBURN  
MINISTRE DU LOISIR, DE LA CHASSE  
ET DE LA PÊCHE DU QUÉBEC

## MESSAGE FROM THE MINISTERS

## SUMMARY OF YEAR II

IN MANY RESPECTS, YEAR II HAS BEEN VERY IMPORTANT FOR US. TO BEGIN WITH, ST. LAWRENCE ACTION PLAN PROGRAMS ARE NOW BEING CARRIED OUT UNDER THE AUSPICES OF BOTH LEVELS OF GOVERNMENT IN THE CONTEXT OF THE FEDERAL-PROVINCIAL AGREEMENT. MOREOVER, YEAR II REPRESENTS THE FIRST YEAR OF FULL ACTIVITY FOR THE ST. LAWRENCE ACTION PLAN. FOR THE MAJORITY OF OUR PROGRAMS, INDEED, YEAR I WAS SHORT BY QUITE A FEW MONTHS. THE YEAR ACTUALLY GOT UNDER WAY IN SEPTEMBER 1988 AND CONCLUDED AT THE END OF MARCH 1989. THIS INTERVAL, HOWEVER, MADE IT POSSIBLE TO SET UP AND FINE-TUNE ADEQUATE OPERATIONAL AND ORGANIZATIONAL STRUCTURES, SUCH AS THE ST. LAWRENCE CENTRE. DURING THE LAST FISCAL PERIOD, THE ACTION PLAN HAS MOVED TO FULL SPEED AS RESULT OF FEDERAL AND PROVINCIAL COOPERATION.

IT IS DIFFICULT TO SUMMARIZE THE ACHIEVEMENTS OF YEAR II WITHOUT MENTIONING FIRST AND FOREMOST THE SIGNING OF THE CANADA-QUEBEC AGREEMENT FOR THE CLEAN-UP, PROTECTION, RESTORATION AND CONSERVATION OF THE ST. LAWRENCE. IN FACT, ON 8 JUNE 1989, ENVIRONMENT CANADA, THE *MINISTÈRE DE L'ENVIRONNEMENT DU QUÉBEC* AND THE *MINISTÈRE DU LOISIR, DE LA CHASSE ET DE LA PÊCHE DU QUÉBEC* AGREED TO COORDINATE THEIR RESPECTIVE ACTION PLANS, IN ORDER TO ENLARGE THE SCOPE OF THEIR SPECIFIC CONTRIBUTIONS.

THIS VERY FORTUNATE INITIATIVE HAS HAD THE EFFECT OF APPRECIABLY ENLARGING THE SCOPE OF THE PROGRAMS INITIATED OVER THE COURSE OF YEAR I. IN OTHER RESPECTS, THE AGREEMENT HAS INVOLVED A REARRANGEMENT OF THE OPERATING STRUCTURE OF THE ACTION PLAN WITH A VIEW TO ENSURING EVEN GREATER EFFECTIVENESS IN OUR INTERVENTIONS.

THE FEDERAL AND PROVINCIAL DEPARTMENTS INVOLVED ARE REPRESENTED ON A MANAGEMENT COMMITTEE WHICH COORDINATES THE INTERVENTIONS OF ALL THE PROGRAMS OF THE ACTION PLAN. TO DO THIS, THE MANAGEMENT COMMITTEE WORKS THROUGH FOUR COORDINATING SUB-COMMITTEES ASSIGNED RESPECTIVELY TO PROTECTION, CONSERVATION, THE STATE OF THE ENVIRONMENT AND RESTORATION.

IMPORTANT PROGRESS HAS BEEN MADE IN EACH OF THE FOUR COMPONENTS OF THE ACTION PLAN. THE "PROTECTION" COMPONENT COMPLETED THE PROFILE OF THE 50 PRIORITY INDUSTRIAL PLANTS OVER THE COURSE OF YEAR II. A COMPLETE SYNTHESIS OF THE INFORMATION COLLECTED ON EACH OF THE 50 PLANTS IS NOW AVAILABLE.

THIS COMPREHENSIVE INFORMATION-GATHERING AND FOLLOW-UP OPERATION HAS BEEN ONE OF THE NUMEROUS CONTRIBUTIONS OF THE CANADA-QUEBEC TASK FORCE, WHICH BRINGS TOGETHER SPECIALISTS FROM THE VARIOUS FEDERAL AND PROVINCIAL DEPARTMENTS ENGAGED IN THE IMPLEMENTATION OF THE ST. LAWRENCE ACTION PLAN.

ON THE SUBJECT OF ENVIRONMENTAL TECHNOLOGIES, MANAGEMENT AT EACH OF THE DESIGNATED 50 INDUSTRIAL PLANTS HAS BEEN CONSULTED IN ORDER TO ESTABLISH NEEDS AND PRIORITIES FOR TECHNOLOGICAL DEVELOPMENT. THIS CONSULTATION HAS SERVED AS A POINT OF DEPARTURE IN THE RESEARCH AND SELECTION OF INNOVATIVE DEVELOPMENT PROJECTS, WHICH THE ACTION PLAN INTENDS TO PROMOTE, IN THE HOPE OF GENERATING CONCRETE SOLUTIONS TO THE PROBLEM OF LIQUID TOXIC WASTE IN THE ST. LAWRENCE.

WITHIN THE FRAMEWORK OF THE "RESTORATION" COMPONENT, CHARACTERIZATION OF THE SEDIMENTS IN THE HARBOURS OF MONTREAL, TROIS-RIVIÈRES, AND QUEBEC CITY HAS BEEN CARRIED OUT DURING YEAR II. THE OVERALL PICTURE OF THE DEGREE OF CONTAMINATION AT THESE THREE IMPORTANT FEDERAL SITES IS NOW CLEAR. THE DISTRIBUTION OF CONTAMINATED SEDIMENTS IN EACH HARBOUR IS TODAY KNOWN WITH GREATER PRECISION, AND CONSEQUENTLY WE ARE IN A POSITION TO WORK OUT APPROPRIATE CLEAN-UP PLANS.

REGARDING THE "CONSERVATION" COMPONENT, YEAR II WAS HIGHLIGHTED BY THE SIGNING OF A FEDERAL-PROVINCIAL AGREEMENT IN PRINCIPLE TO CREATE A MARINE PARK AT THE MOUTH OF THE SAGUENAY. THIS PROGRAM, SO CRUCIALLY IMPORTANT TO THE REPRESENTATIVE PLANT AND ANIMAL LIFE OF THE SAGUENAY AND THE ST. LAWRENCE ESTUARY, CAN NOW BE IMPLEMENTED IN THE COURSE OF YEAR III. IN ANOTHER AREA, CONSIDERABLE EFFORT HAS BEEN DEVOTED TO PREPARE THE APPLICATION OF THE LAW GOVERNING ENDANGERED OR VULNERABLE SPECIES ADOPTED BY THE QUEBEC NATIONAL ASSEMBLY IN JUNE 1989.

A CERTAIN NUMBER OF PUBLICATIONS HAVE REPORTED ON THE PROGRESS MADE WITHIN THE FRAMEWORK OF THE ST. LAWRENCE ACTION PLAN AND ITS OBJECTIVES. FOR EXAMPLE, A SPECIAL NEWSLETTER, *LE FLEUVE*, IS PRODUCED TO SERVE AS THE COMMUNICATIONS TOOL OF THE INTERESTED PARTIES. PUBLISHED FOUR TIMES A YEAR IN ENGLISH AND IN FRENCH, AND DISTRIBUTED WITHOUT CHARGE, *LE FLEUVE* IS INTENDED AS A MEDIUM OF COMMUNICATION AND INFORMATION FOR ALL THE PARTNERS IN THE ACTION PLAN: INDIVIDUALS, COMPANIES AND ORGANIZATIONS INTERESTED IN THE PROTECTION, CONSERVATION AND RESTORATION OF THE ST. LAWRENCE.

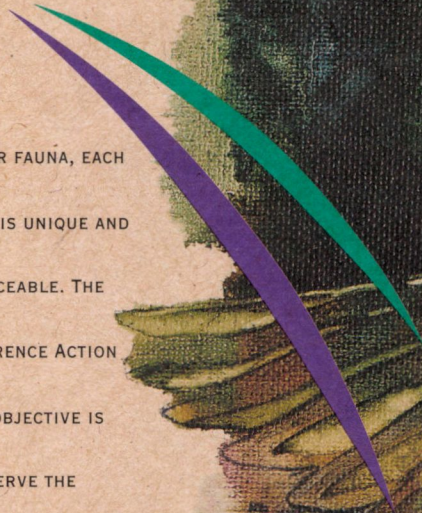
LAST FALL, THE CANADIAN WILDLIFE SERVICE MADE PUBLIC ITS HABITATS ACQUISITION AND MANAGEMENT AID PROGRAM, WHICH LENDS FINANCIAL AND TECHNICAL SUPPORT TO NON-GOVERNMENTAL ORGANIZATIONS WORKING FOR THE PROTECTION OF HABITATS IN QUEBEC. IN NOVEMBER 1989, THE SERVICE ALSO LAUNCHED A NEWSLETTER, *HABITATS*, IN ORDER TO ENCOURAGE THE EXCHANGE OF INFORMATION BETWEEN ALL LEVELS OF PARTICIPANTS DEVOTED TO THE CAUSE OF WILDLIFE HABITATS. FISHERIES AND OCEANS CANADA, FOR ITS PART, PUBLISHED THE FIRST ISSUE OF THE *BELUGA* NEWSLETTER IN JUNE 1989. THE PURPOSE OF THIS NEWSLETTER IS TO KEEP THE VARIOUS PARTICIPANTS INFORMED ABOUT RESEARCH ACTIVITIES, PUBLIC EDUCATION AND CONSERVATION EFFORTS FOR THE BELUGA POPULATIONS OF THE ST. LAWRENCE.



**PROGRAM  
REVIEW**

**CONSERVATION**

FLORA OR FAUNA, EACH  
SPECIES IS UNIQUE AND  
IRREPLACEABLE. THE  
ST. LAWRENCE ACTION  
PLAN'S OBJECTIVE IS  
TO PRESERVE THE  
PRICELESS NATURAL  
HERITAGE WE  
ALL SHARE.



## PROTECTION OF ENDANGERED SPECIES

ACTIVITIES UNDERTAKEN IN THE COURSE OF YEAR II INCLUDE PUBLICATION OF A QUEBEC ATLAS OF AMPHIBIANS AND REPTILES, THE INVENTORY OF SPECIES LIKELY TO BE DESIGNATED AS ENDANGERED OR VULNERABLE AND THE PREPARATION OF REPORTS ON THE STATUS OF VARIOUS SPECIES. OTHER WORK HAS ENABLED US TO DEEPEN OUR KNOWLEDGE OF SUCH PRIORITY SPECIES AS THE BLACK STURGEON, THE YELLOW STURGEON, THE RAINBOW SMELT AND THE STRIPED BASS. ONE AIM OF THESE ACTIVITIES HAS BEEN TO PREPARE FOR THE IMPLEMENTATION OF THE LAW GOVERNING ENDANGERED OR VULNERABLE SPECIES ADOPTED BY THE QUEBEC NATIONAL ASSEMBLY IN JUNE 1989. SURVIVAL PLANS FOR SUCH SPECIES AS THE PIPING PLOVER AND THE PEREGRINE FALCON HAVE BEEN PUT INTO EFFECT AS WELL. AERIAL INVENTORIES OF THE BELUGA POPULATION HAVE BEEN TAKEN, THEIR HABITATS MAPPED, AND AN ANALYSIS HAS BEEN MADE OF THE TOXIC CHEMICAL SUBSTANCES IN CARCASSES THAT HAVE BEEN RECOVERED. MOREOVER, SURVEILLANCE ACTIVITIES, SETTING UP

PROTECTIVE PATROLS AND THE ISSUANCE OF DIRECTIVES SPECIFIC TO THE BELUGA HAVE CONTRIBUTED TO AN IMPROVED LEVEL OF CONTROL OVER THE ENVIRONMENTAL DISRUPTION OF THE SPECIES.

### ENDANGERED SPECIES IN QUEBEC

FOR THE STUDY OF BIRDS, THE CANADIAN WILDLIFE SERVICE HAS PUBLISHED A WORK ENTITLED *ENDANGERED BIRD SPECIES IN QUEBEC* PREPARED BY THE QUEBEC ASSOCIATION OF ORNITHOLOGICAL GROUPS. THIS DOCUMENT IS THE FIRST OVERALL ANALYSIS OF THE BIRDS THAT FREQUENT THE PROVINCE. ITS PURPOSE IS TO ESTABLISH A LIST OF THOSE ON THE ENDANGERED LIST. THE SERVICE, WHICH HAS ALSO PREPARED REPORTS ON THE STATUS OF THE PEREGRINE FALCON AND NELSON'S SHARP-TAILED SPARROW, IS PRESENTLY WORKING ON A REEVALUATION OF ITS ACTION PLAN FOR THE MIGRANT LOGGERHEAD SHRIKE.

THE *MINISTÈRE DU LOISIR, DE LA CHASSE ET DE LA PÊCHE* HAS CONTINUED ITS WORK ON AN ATLAS OF AMPHIBIANS AND REPTILES. SPECIAL WORK HAS ALSO BEEN CARRIED OUT TO ASCERTAIN THE CONDITION OF THE WOOD TURTLE AND THE EASTERN SPINY SOFT-SHELL TURTLE.

FISH HAVE BEEN GIVEN CAREFUL STUDY. THE WORK OF FISHERIES AND OCEANS CANADA AND THE *MINISTÈRE DU LOISIR, DE LA CHASSE ET DE LA PÊCHE* HAS ENABLED US TO IMPROVE OUR KNOWLEDGE OF PRIORITY SPECIES SUCH AS THE BLACK STURGEON, THE YELLOW STURGEON, THE RAINBOW SMELT AND THE STRIPED BASS.

PLANT LIFE HAS ALSO BEEN GIVEN GENEROUS ATTENTION. THANKS TO A FINANCING AGREEMENT BETWEEN THE *MINISTÈRE DE L'ENVIRONNEMENT DU QUÉBEC* AND THE CANADIAN WILDLIFE SERVICE, IT HAS BEEN POSSIBLE TO PREPARE AN INITIAL LIST OF THE VASCULAR PLANTS OF

THE ST. LAWRENCE WHICH REQUIRE SPECIAL ATTENTION DUE TO DECLINING POPULATIONS. NO LESS THAN 200 PLANTS WITH FEWER THAN 10 COLONIES IN QUEBEC APPEAR ON THIS LIST OF PRIORITY SPECIES. THREE QUARTERS OF THESE SPECIES OCCUPY A HABITAT DIRECTLY INFLUENCED BY THE PRESENCE OF THE ST. LAWRENCE, WHILE THE REST ARE TO BE FOUND IN COLONIES LESS THAN A KILOMETRE FROM THE RIVER.

ALL THE AFOREMENTIONED STUDIES AND ACTIVITIES PERMIT US TO CHECK DATA ESSENTIAL FOR THE PROTECTION OF ENDANGERED SPECIES. A FEDERAL-PROVINCIAL TEAM HAS PREPARED A LIST OF PRECARIOUS\* SPECIES IN THE ST. LAWRENCE CORRIDOR\*\*. THIS LIST INCLUDES 11 SPECIES OF FISH, 2 SPECIES OF AMPHIBIANS, 5 SPECIES OF REPTILES, 11 SPECIES OF BIRDS AND 126 SPECIES OF VASCULAR PLANTS. AS THIS REPORT GOES TO PRESS, DISCUSSIONS ARE UNDER WAY FOR THE IDENTIFICATION OF PRECARIOUS MARINE MAMMAL SPECIES. THE SAME DATA WILL BE USED TO IDENTIFY SITES THAT MUST BE PROTECTED UNDER THE HABITAT CONSERVATION PROGRAM.

\* This term is used to describe vulnerable species, those that are endangered and those facing extinction.

\*\* This includes the river itself, riverside and wetlands from the Quebec-Ontario border to Blanc-Sablon on the North Shore and Gaspé on the South Shore. The St. Lawrence corridor also includes the water around Île d'Anticosti and Îles-de-la-Madeleine as well as the Saguenay River.

## HABITAT CONSERVATION

THE HABITAT CONSERVATION PROGRAM HAS CONCENTRATED ITS ACTIVITIES IN THREE SECTORS BESIDES THE ACQUISITION OF WILDLIFE HABITATS. FIRST, IT HAS ORGANIZED INFORMATION AND EDUCATION SESSIONS INTENDED FOR CONSERVATION GROUPS, TO PREPARE THEM FOR ACQUIRING AND MANAGING WILDLIFE HABITATS. MORE THAN \$94,000 IN FINANCIAL AID HAS BEEN GRANTED TO NON-GOVERNMENTAL ORGANIZATIONS WORKING FOR THE PROTECTION AND MANAGEMENT OF WILDLIFE HABITATS. SECOND, THE PROGRAM HAS DEVELOPED A RANGE OF COMMUNICATION TOOLS FOR CREATING AWARENESS AND INFORMING THE PUBLIC. THIRD, THE PROGRAM HAS MADE IT A POINT TO DEVELOP EXPERTISE IN THE IMPROVEMENT OF HABITATS AND TO DEVELOP THE PRACTICAL TOOLS NEEDED FOR RESTORING DETERIORATED HABITATS IN OUR NATIONAL WILDLIFE RESERVES AND ELSEWHERE. THE DEPARTMENT OF FISHERIES AND OCEANS

HAS ALSO COMPLETED AN INVENTORY OF PHYSICAL CHANGES TO SHORELINE HABITATS ON THE ESTUARY (INCLUDING THE SAGUENAY) AND IN THE GULF OF ST. LAWRENCE.

### DIRECT ACQUISITION OF HABITATS

THE FEDERAL COMPONENT OF THE ST. LAWRENCE ACTION PLAN IS PLANNING THE ACQUISITION, CONTROL AND IMPROVEMENT OF 5,000 HECTARES OF NATURAL ECOSYSTEMS AND HABITATS SHELTERING VULNERABLE OR ENDANGERED SPECIES ALONG THE ST. LAWRENCE.

THE MAJOR PORTION OF THESE LANDS WILL BE USED TO CONSOLIDATE CERTAIN NATIONAL WILDLIFE AREAS, PRESERVE MANY NESTING SITES AND HABITATS OF RARE SPECIES, PROVIDE GROWING SPACE FOR NUMEROUS PLANT SPECIES OR TO DEVELOP VEGETATION THAT IS BETTER ADAPTED TO THE AREA. IN CERTAIN CASES, THE PLAN WILL UNDERTAKE WORKS FOR THE IMPROVEMENT OF EXISTING ENVIRONMENTS OR THE PLANNING OF ARTIFICIAL HABITATS.

YEAR II ALSO SAW THE DIRECT ACQUISITION OF 335 ADDITIONAL HECTARES BY THE CANADIAN WILDLIFE SERVICE. THIS MEANS THAT SINCE THE IMPLEMENTATION OF THE ST. LAWRENCE ACTION PLAN, SOME 500 HECTARES HAVE BEEN ACQUIRED OR ARE IN THE PROCESS OF BEING ACQUIRED. MOST OF THESE LANDS ARE SITUATED IN THE REGIONS OF L'ISLE-VERTE, CAP TOURMENTE, THE LAC SAINT-PIERRE DELTA AND THE CONTRECOEUR ISLANDS.

IT MUST BE STRESSED THAT THE 335 HECTARES THE CANADIAN WILDLIFE SERVICE ACQUIRED (OR ARRANGED TO ACQUIRE) THIS YEAR WERE OBTAINED BY MUTUAL CONSENT. TRANSACTIONS OF THIS SORT USUALLY INVOLVE A LONG AND COMPLEX PROCESS. INDEED, DIRECT ACQUISITION IS A FAIRLY HARSH MEASURE, AND IS ONLY ONE OF THE METHODS THAT THE CANADIAN WILDLIFE SERVICE EMPLOYS TO SAFEGUARD HABITATS. THE SERVICE MAY ALSO HAVE RECOURSE TO EASEMENTS, AND MAY DEVELOP LAND TRUSTS AS WELL.

UNDER THE FIVE-YEAR AGREEMENT ON HABITATS, THE GOVERNMENT OF QUEBEC HAS CONTRIBUTED TO THE ACQUISITION OF 685 HECTARES OF WETLANDS ALONG THE ST. LAWRENCE, MAINLY FOR THE BAIE-DU-FEBVRE IMPROVEMENT PROJECT.



IT IS WORTH NOTING THAT, IN THE WAKE OF EFFORTS TO COORDINATE FEDERAL AND PROVINCIAL PARTICIPATION, A WORKING GROUP COMPOSED OF REPRESENTATIVES FROM THE CANADIAN WILDLIFE SERVICE, THE *MINISTÈRE DE L'ENVIRONNEMENT DU QUÉBEC* AND THE *MINISTÈRE DU LOISIR, DE LA CHASSE ET DE LA PÊCHE DU QUÉBEC* SET PRIORITIES FOR SITES TO BE PRESERVED FOR VARIOUS SPECIES, INCLUDING WATERFOWL. OF 30 SITES RETAINED, 10 WERE GIVEN PRIORITY. THREE OF THESE SITES ARE EARMARKED FOR ECOLOGICAL RESERVES TO BE SPONSORED BY THE *MINISTÈRE DE L'ENVIRONNEMENT DU QUÉBEC*.

IT IS EQUALLY IMPORTANT TO STRESS THAT FOR THE FIRST TIME, THANKS TO THE WORK DONE BY THE *MINISTÈRE DE L'ENVIRONNEMENT DU QUÉBEC*, WE HAVE AT OUR COMMAND A UNIFIED PICTURE OF WHAT IS KNOWN ABOUT THE FLORA AND VEGETATION OF THE ST. LAWRENCE. THIS PICTURE SHOWS THE GAPS THAT REMAIN TO BE FILLED IN OUR KNOWLEDGE OF THE HABITATS OF PLANTS AND OF RARE, VULNERABLE OR ENDANGERED PLANT COMMUNITIES.

LOCATION OF PROTECTED HABITATS (1989-1990)



## CREATION OF A MARINE PARK

WITH THE SIGNATURE OF A TRULY HISTORIC AGREEMENT ON 6 APRIL 1990, CANADA AND QUEBEC HAVE UNDERTAKEN TO CREATE A MARINE PARK AT THE JUNCTION OF THE SAGUENAY AND THE ST. LAWRENCE RIVERS. THIS MARINE PARK, THE FIRST OF ITS KIND IN CANADA, EMBODIES WITHOUT DOUBT, A PROGRAM CRUCIAL TO THE CONSERVATION OF THE UNIQUE MARINE PLANT AND ANIMAL LIFE IN THIS AREA. ONE OF ITS REMARKABLE FEATURES IS A SUBSTANTIAL PART OF THE HABITAT OCCUPIED BY THE ST. LAWRENCE BELUGA POPULATION, WHICH WAS GRANTED THE STATUS OF AN ENDANGERED ANIMAL POPULATION IN 1983. THIS IS A PROJECT OF EXCEPTIONAL SCOPE. IT RELIES ON THE CLOSEST POSSIBLE COLLABORATION BETWEEN THE TWO LEVELS OF GOVERNMENT, BOTH OF WHICH SEEK TO COMPLEMENT EACH OTHER'S ACTIVITIES WHILE SHARING THEIR MATERIAL RESOURCES.

### THE MARINE PARK: A REALITY

THE TWO GOVERNMENTS HAVE ACCORDINGLY AGREED TO COMBINE THEIR EFFORTS TO CONSERVE THE ENVIRONMENT.

THEY WILL CONTINUE TO EXERCISE THEIR RESPECTIVE RESPONSIBILITIES TOWARDS THE ENVIRONMENT, WITH SPECIAL ATTENTION TO THE PRESERVATION OF NATURE AND NATURAL RESOURCES. ACTION, THOUGH CONSIDERED AS EMANATING FROM ONE PARTY OR THE OTHER, ACCORDING TO THE PRINCIPLE OF ACCOUNTABILITY, WILL BE TAKEN IN A COOPERATIVE FASHION.

IN THIS RESPECT, THE AGREEMENT ESTABLISHES A VERY PROMISING PARTNERSHIP. CANADA AND QUEBEC HAVE ACTUALLY AGREED, IN THIS CASE, TO JOINTLY CONSULT THE PUBLIC AND TO SHARE, WHENEVER POSSIBLE, INFRASTRUCTURES TO PROVIDE INFORMATION SERVICES TO ALL VISITORS TO THE PARK.

IN VIEW OF THE MANY PARTICIPANTS WITH RESPONSIBILITIES IN THE ENVIRONMENT, THE TWO GOVERNMENTS HAVE AGREED TO COORDINATE THEIR RESPECTIVE ACTIVITIES. TO THIS END, A COORDINATING COMMITTEE HAS BEEN CREATED WITH THE MANDATE TO ADVISE THE RESPONSIBLE MINISTERS ON ALL COMMON MEASURES FOR THE PRESERVATION AND ENHANCEMENT OF THE MARINE PARK. THE WORK OF THIS COMMITTEE BEGAN THE DAY THE AGREEMENT WAS SIGNED.

TWO EVENTS WILL HIGHLIGHT THE FIRST YEAR OF THE PARK'S EXISTENCE. IN THE SIX MONTHS AFTER THE SIGNING OF THE AGREEMENT, THE GOVERNMENTS, AS

PARTNERS, WILL PREPARE THE LEGISLATIVE AND REGULATORY MEASURES THAT WILL ENABLE THE PARLIAMENT OF CANADA AND THE QUEBEC NATIONAL ASSEMBLY TO LEGALLY CREATE THE SAGUENAY MARINE PARK. AFTER THAT, THE TERRITORY INITIALLY PROPOSED UNDER THE AGREEMENT WILL BE SUBJECT TO PUBLIC CONSULTATION, IN ORDER TO ESTABLISH THE FINAL BOUNDARIES OF THE MARINE PARK.

**P R O T E C T I O N**

THE REDUCTION OF  
LIQUID TOXIC WASTE  
DISCHARGED INTO THE  
RIVER BY INDUSTRIAL  
PLANTS IS AT THE ROOT  
OF ALL ST. LAWRENCE  
ACTION PLAN  
ACTIVITIES AND IS  
SOMETHING THAT WILL  
BE ACHIEVED THROUGH  
FEDERAL-PROVINCIAL  
INTERVENTION.





## TOXIC INDUSTRIAL WASTE REDUCTION

DURING YEAR II, THE ACTION PLAN HAS PROCEEDED WITH STUDIES CONCERNED WITH BOTH THE BIO-PHYSICAL AND THE ECONOMIC ENVIRONMENTS — PARTICULARLY, IN THE LATTER CASE AND THE CAPACITY OF INDUSTRY TO ABSORB THE COSTS OF DECONTAMINATION. EXAMPLES INCLUDE THE INTRODUCTION OF A SATELLITE SURVEYING OF INDUSTRIAL DISCHARGES IN THE AQUATIC ENVIRONMENT, AS WELL AS RESEARCH INTO TECHNOLOGIES FOR THE REDUCTION OF POLYCYCLIC AROMATIC HYDROCARBONS (PAHS) IN THE PRINCIPAL INDUSTRIAL SECTORS OF QUEBEC. AT THE SAME TIME, A FEDERAL-PROVINCIAL COMMITTEE ALLOWED CLOSE COLLABORATION IN THE REVISION OF THE ENTIRE BODY OF REGULATIONS FOR THE PULP AND PAPER INDUSTRY. FURTHERMORE, A COMPUTERIZED DATA MANAGEMENT AND CARTOGRAPHIC SYSTEM HAS BEEN DEVELOPED FOR INDUSTRIAL WASTES.

### PRIORITY INDUSTRIAL PLANTS

THE TOXIC INDUSTRIAL WASTE-REDUCTION PROGRAM ATTACKS THE PROBLEM ADDRESSED IN THE PRIMARY OBJECTIVE OF THE ST. LAWRENCE ACTION PLAN: BETWEEN NOW AND 1993 TO REDUCE BY 90 PERCENT THE LIQUID TOXIC WASTE BEING DISCHARGED INTO THE ST. LAWRENCE BY 50 INDUSTRIAL PLANTS WHICH FEDERAL AND PROVINCIAL AUTHORITIES CONSIDER PRIME TARGETS FOR ACTION.

FOLLOWING THE PUBLICATION IN JUNE 1989 OF THE LIST OF THESE 50 INDUSTRIAL PLANTS, THE TOXIC INDUSTRIAL WASTE REDUCTION PROGRAM HAS REINFORCED THE INVENTORY AND PROFILE WORK UNDERTAKEN IN YEAR I.

A COMPILATION OF THE MOST RECENT DATA HAS BEEN COMPLETED FOR THE 50 PRIORITY INDUSTRIAL PLANTS. THIS COMPILATION HAS BEEN PUBLISHED, AND THE DATA ENTERED INTO THE COMPUTER SYSTEM. IN ORDER TO OBTAIN AN ASSESSMENT OF WASTE EFFLUENTS, THE ACTION TEAM HAS WORKED OUT SPECIFICATIONS FOR CHARACTERIZING 27 INDUSTRIAL PLANTS, AND HAS BEGUN TAKING SAMPLES ON THE SITES OF 24 OF THESE PLANTS. THE TEAM INVOLVES THE PRIVATE SECTOR IN CARRYING OUT THESE TASKS. AS OF 31 MARCH 1990, 10 PROFILE PROJECTS HAVE BEEN COMPLETED. AN AGREEMENT HAS ALSO BEEN SIGNED WITH THE QUEBEC FOREST INDUSTRIES ASSOCIATION FOR EVALUATING THE DISCHARGE OF 13 PULP AND PAPER MILLS TARGETED UNDER THE ST. LAWRENCE ACTION PLAN.

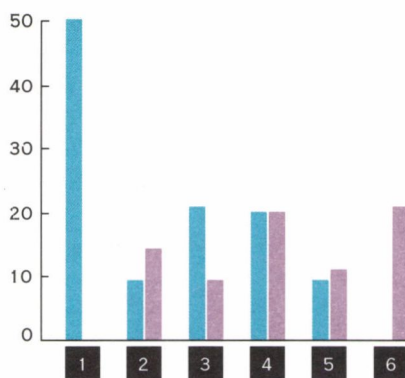
THE ACTION TEAM IS RELYING ON THE EXPERIENCE OF THE WATER CLEAN-UP PROGRAM IMPLEMENTED BY THE *MINISTÈRE DE L'ENVIRONNEMENT DU QUÉBEC* FOR

ESTABLISHING ENVIRONMENTAL REQUIREMENTS. AS OF 31 MARCH 1990, 21 INDUSTRIAL PLANTS HAVE SUBMITTED CLEAN-UP PROGRAMS DESIGNED TO CONFORM WITH THESE OBJECTIVES. THE MINISTRY HAS APPROVED 19 OF THESE PROGRAMS, AND CLEAN-UP WORK HAS ALREADY BEEN COMPLETED IN 10 PLANTS. WITH THESE PROJECTS, WE CAN ALREADY FORESEE IMPORTANT REDUCTIONS OF PRIORITY TOXIC WASTE — SUCH AS PAHS AND MERCURY.

WHERE PULP AND PAPER MILLS AND PETROLEUM REFINERIES ARE CONCERNED, CLEAN-UP ACTION CAN ONLY BEGIN FOLLOWING THE OVERHAUL OF EXISTING REGULATIONS. IN BOTH SECTORS, REVISION OF THESE REGULATIONS IS ACTUALLY IN PROGRESS. THE REVISION OF THE REGULATIONS FOR PULP AND PAPER MILLS HAS BEEN FACILITATED BY A RECENT ECONOMIC STUDY OF THE INDUSTRY.

THE ACTION TEAM HAS ALSO DEVOTED ITSELF TO AN IMPORTANT NUMBER OF ACTIVITIES SUPPORTING DIRECT INDUSTRY INTERVENTION. THESE INCLUDE LOCAL-IMPACT EVALUATIONS OF LIQUID INDUSTRIAL WASTE, THE DEVELOPMENT OF A NORMATIVE MODEL FOR PETROLEUM REFINERIES, ALUMINUM SMELTERS AND METALLURGICAL PLANTS AND THE TECHNOLOGICAL EVALUATION OF PROJECTS TO DEVELOP TECHNOLOGIES FOR THE REDUCTION OF LIQUID TOXIC WASTE.

**SUMMARY OF LIQUID TOXIC WASTE REDUCTION**



- 1 INVENTORY
- 2 CHARACTERIZATION
- 3 ENVIRONMENTAL GOAL SETTING
- 4 WASTE NORMS
- 5 IMPLEMENTATION
- 6 TOXIC INDUSTRIAL WASTE FOLLOW-UP

- COMPLETED
- ONGOING

**THE 50 PRIORITY INDUSTRIAL PLANTS:**

	1	2	3	4	5	6
ACIERS ATLAS LTÉE, DIV. RIO ALGOM, TRACY	Completed		Completed	Completed	Ongoing	
ALBRIGHT & WILSON AMÉRIQUE (ERCO), VARENNES	Completed	Completed			Ongoing	
ALCAN, ALMA	Completed		Ongoing			
ALCAN, JONQUIÈRE	Completed	Completed				
ALCAN, LA BAIE	Completed		Completed	Completed	Ongoing	
ALCAN, MELOCHEVILLE	Completed		Completed	Completed		
ALUMINERIE DE BÉCANCOUR INC., BÉCANCOUR	Completed		Completed	Completed		Ongoing
CASCADES (JONQUIÈRE) INC., JONQUIÈRE		Ongoing		Ongoing		Ongoing
CIL INC., BÉCANCOUR	Completed		Completed	Completed		
CONSOLIDATED BATHURST INC., LA BAIE	Completed	Ongoing		Ongoing		Ongoing
CONSOLIDATED BATHURST INC., TROIS-RIVIÈRES	Completed	Completed		Ongoing		Ongoing
DAISHOWA INC., QUEBEC CITY	Completed	Ongoing		Ongoing		Ongoing
DOMINION TEXTILE INC., SAINT-TIMOTHÉE	Completed		Completed	Completed	Ongoing	
DONOHUE INC., CLERMONT		Ongoing		Ongoing		Ongoing
ELKEM METAL CANADA INC., BEAUHARNOIS	Completed		Ongoing			
F.F. SOUCY INC., RIVIÈRE-DU-LOUP	Completed	Ongoing		Ongoing		Ongoing
HÉROUX INC., LONGUEUIL	Completed		Completed	Completed	Completed	
HOESCHT CANADA INC., VARENNES	Completed		Completed	Completed		
INDUSTRIES PPG CANADA INC., BEAUHARNOIS	Completed		Ongoing	Completed		Ongoing
KEMTEC INC. (GULF), MONTREAL EAST	Completed		Ongoing			
KRUGER INC., TROIS-RIVIÈRES	Completed	Completed		Ongoing		Ongoing
LA CIE DE PAPIER QUÉBEC ET ONTARIO LTÉE (QNS), BAIE-COMEAU	Completed	Ongoing		Ongoing		Ongoing
LA COMPAGNIE PRICE LTÉE, ALMA	Completed	Ongoing		Ongoing		Ongoing
LA COMPAGNIE PRICE LTÉE, BEAUPRÉ	Completed	Ongoing		Ongoing		Ongoing
LA COMPAGNIE PRICE LTÉE, JONQUIÈRE	Completed	Ongoing		Ongoing		Ongoing
LES ALCOOLS DE COMMERCE LTÉE, VARENNES	Completed		Completed	Completed	Ongoing	
LES INDUSTRIES DE PRÉSERVATION DU BOIS LTÉE, TRACY	Completed		Completed	Completed		
LES PAPIERS FINS DOMTAR, BEAUHARNOIS	Completed	Ongoing		Ongoing		Ongoing
LES PAPIERS PERKINS LTÉE, CANDIAC	Completed			Ongoing		Ongoing
LES SERVICES T.M.G. INC. (MINE NIOBEC), SAINT-HONORÉ	Completed			Ongoing		Ongoing
LOCWELD, CANDIAC	Completed	Completed	Completed	Completed		
MONSANTO CANADA INC., VILLE LASALLE	Completed		Ongoing			
N.L. CHEM CANADA INC., VARENNES	Completed		Completed	Completed	Ongoing	
NORANDA INC., (DIVISION CCR), MONTREAL EAST	Completed			Completed		
PAPIER JOURNAL DOMTAR, DONNACONNA	Completed	Ongoing		Ongoing		Ongoing
PÉTRO-CANADA/PÉTROCHEM, POINTE-AUX-TREMBLES	Completed	Completed		Ongoing		Ongoing
PÉTRMONT INC., VARENNES	Completed	Completed	Completed	Completed		
PRATT ET WHITNEY DU CANADA INC., LONGUEUIL	Completed		Completed	Completed	Ongoing	
PRODUITS CHIMIQUES EXPRO INC., SAINT-TIMOTHÉE	Completed		Completed	Completed	Ongoing	
PRODUITS FORESTIERS C.P. INC. (CIP), TROIS-RIVIÈRES	Completed	Ongoing		Ongoing		Ongoing
PRODUITS NACAN LTÉE, BOUCHERVILLE	Completed	Completed	Ongoing			
QIT, FER ET TITANE INC., SOREL	Completed		Completed	Completed	Ongoing	
REYNOLDS CANADA LTÉE, CAP-DE-LA-MADELEINE	Completed		Ongoing			
SHELL CANADA LTÉE, MONTREAL EAST	Completed	Completed		Ongoing		Ongoing
SIDBEC-DOSCO LTÉE, CONTRECŒUR	Completed		Ongoing			
SOCIÉTÉ D'ALUMINIUM REYNOLDS (CANADA) LTÉE, BAIE-COMEAU	Completed	Completed	Completed	Completed	Ongoing	
TIOXIDE INC., TRACY	Completed	Completed	Completed	Completed	Ongoing	
ULTRAMAR, SAINT-ROMUALD	Completed	Ongoing		Ongoing		Ongoing
UNION CARBIDE DU CANADA LTÉE, MONTREAL EAST	Completed		Ongoing			
ZEC DU CANADA LTÉE, VALLEYFIELD	Completed		Completed	Completed		

## TECHNOLOGICAL DEVELOPMENT

THIS PROGRAM IS AN EXCELLENT EXAMPLE OF THE PHILOSOPHY OF PARTNERSHIP THAT INSPIRED THE ST. LAWRENCE ACTION PLAN. IN JUNE 1989, THE ST. LAWRENCE CENTRE CONSULTED THE 50 DESIGNATED INDUSTRIES WITH THE VIEW TO JOINTLY ESTABLISHING PROBLEMS, NEEDS AND SECTOR-BY-SECTOR PRIORITIES FOR TECHNOLOGICAL DEVELOPMENT. THE CENTRE COLLABORATED AS WELL WITH THE *MINISTÈRE DE L'ENVIRONNEMENT DU QUÉBEC* AND THE QUEBEC SOCIETY FOR WATER CLEAN-UP IN SOME TEN PROJECTS FOR TECHNOLOGICAL DEVELOPMENT TO BE COMPLETED BY APRIL 1991 AT A TOTAL COST OF \$1.5 MILLION. NOT TO MENTION THE WORKING AGREEMENT WITH THE BIOTECHNOLOGY RESEARCH INSTITUTE TO SET UP APPLICABLE BIO-TECHNOLOGIES FOR THE DECONTAMINATION OF SOILS CONTAINING HYDROCARBONS, SIGNED IN MAY 1989. THIS PROJECT INVOLVES A TOTAL INVESTMENT OF \$2 MILLION OVER THREE YEARS.

## PARTNERSHIPS AND PRIVATE ENTERPRISE

THE ST. LAWRENCE CENTRE HAS WORKED WITH THE PRIVATE SECTOR IN A NUMBER OF AREAS TO LAUNCH DEVELOPMENT PROJECTS AND DEMONSTRATIONS OF NEW ENVIRONMENTAL TECHNOLOGIES.

THE CENTRE HAS UNDERTAKEN THE DEVELOPMENT OF SEVERAL NEW CLEAN-UP TECHNOLOGIES. ONE PROJECT INVOLVES THE ELIMINATION AND RETRIEVAL OF HEAVY METALS IN INDUSTRIAL EFFLUENTS FROM THE METALLURGICAL, EXTERIOR-COATINGS AND PETROCHEMICAL SECTORS. ANOTHER EXPLORES THE DECONTAMINATION OF SOILS AND THE RETRIEVAL OF MERCURY BY PHYSICO-CHEMICAL METHODS. A THIRD PROJECT IS FOR THE TREATMENT AND DEHYDRATION OF SLUDGE FROM TREATMENT SYSTEMS USED IN THE METALLURGY, BIO-CHEMISTRY AND OIL-REFINING INDUSTRIES.

THE SLUDGE DEHYDRATION PROJECT COVERS A PERIOD OF 17 MONTHS AT AN ESTIMATED COST OF \$1.5 MILLION, OF WHICH 50% IS FINANCED BY THE COMPANY THAT DEVELOPED THE PROJECT (*LES INDUSTRIES FOURNIER INC.*), 40% BY THE ST. LAWRENCE CENTRE AND 10% BY THE TECHNICAL SERVICES AND TECHNOLOGICAL DEVELOPMENT DIVISION OF ENVIRONMENT CANADA. THE MAIN OBJECTIVE OF THE PROJECT IS TO DESIGN AND BUILD AN EXPERIMENTAL ROTARY PRESS, A MOBILE DEHYDRATION UNIT THAT IS FLEXIBLE AND ADAPTABLE TO THE NEEDS OF THE VARIOUS TARGET INDUSTRIES. THE PARTICIPANTS INTEND TO PROCEED WITH TRIAL RUNS ON THREE REPRESENTATIVE TYPES OF SLUDGE FROM THE PRIORITY INDUSTRIES ALONG THE ST. LAWRENCE. A PARALLEL RESEARCH AND DEVELOPMENT EFFORT WILL ATTEMPT TO DESIGN NEW FILTRATION ELEMENTS AND STRAINERS FOR INDUSTRIAL USE.

THIS IS A TANGIBLE ACHIEVEMENT THAT WILL PERMIT THE REDUCTION OF LIQUID TOXIC WASTE IN THE RIVER AND OTHER WATERWAYS, IN DIRECT RESPONSE TO THE PRIORITIES OF THE ST. LAWRENCE ACTION PLAN. IT WILL ALSO FAVOUR A MEASURABLE REDUCTION OF THE QUANTITIES OF SLUDGE THAT AT PRESENT MUST BE BURIED OR INCINERATED, AND WILL PERMIT A MORE ECONOMICAL RETRIEVAL OF VALUABLE MATERIALS FROM INDUSTRIAL WASTE. THIRTY-SEVEN POTENTIAL CUSTOMERS, MANY OF THEM LOCATED ON THE BANKS OF THE RIVER, HAVE ALREADY EXPRESSED INTEREST IN THIS NEW TECHNOLOGY.

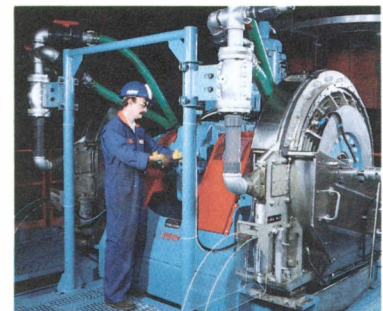
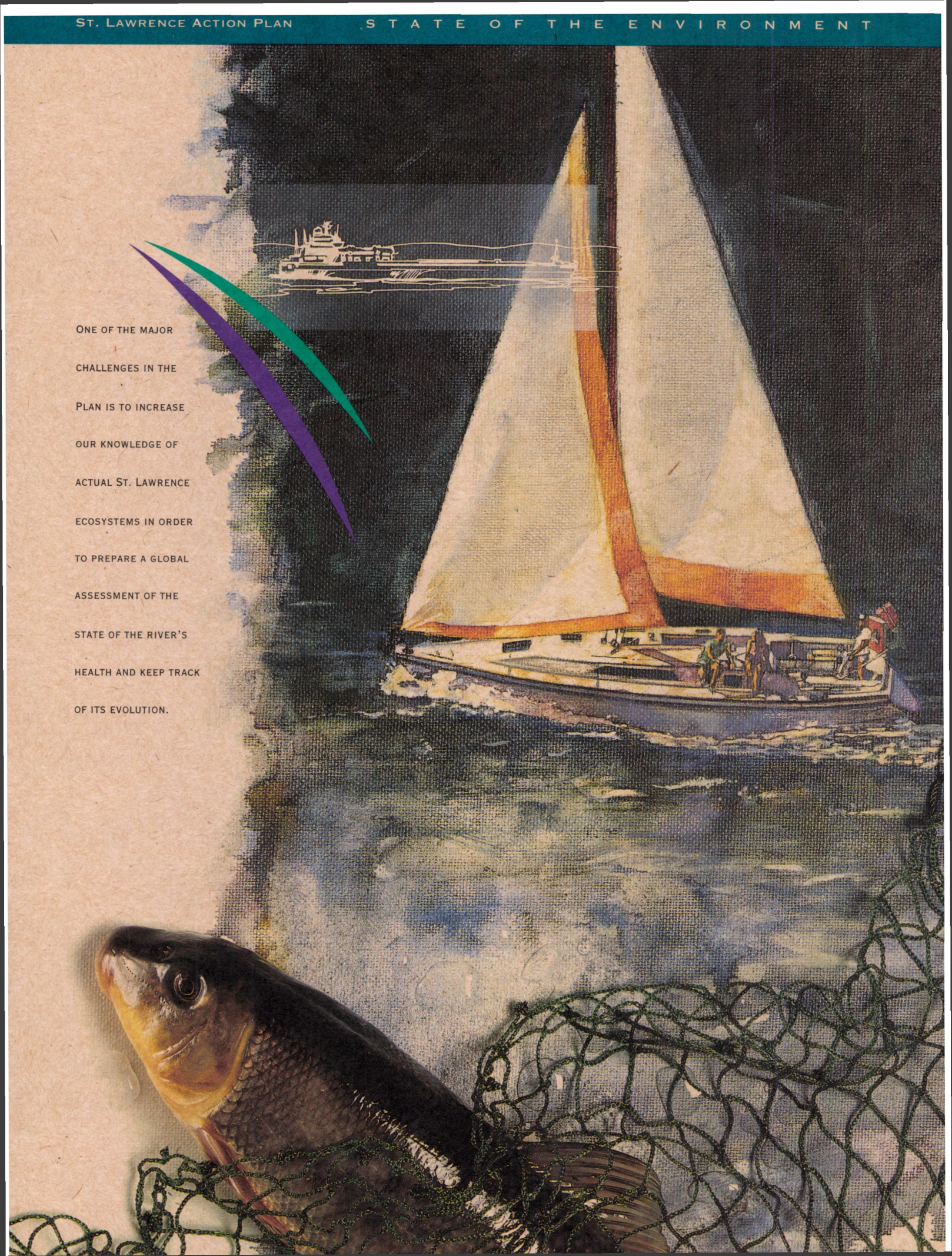


PHOTO: RICHARD LAVERDIÈRE/CRIC



**STATE OF THE  
ENVIRONMENT**



ONE OF THE MAJOR  
CHALLENGES IN THE  
PLAN IS TO INCREASE  
OUR KNOWLEDGE OF  
ACTUAL ST. LAWRENCE  
ECOSYSTEMS IN ORDER  
TO PREPARE A GLOBAL  
ASSESSMENT OF THE  
STATE OF THE RIVER'S  
HEALTH AND KEEP TRACK  
OF ITS EVOLUTION.

## TOXIC INPUTS

THIS PROGRAM ENDEAVOURS TO DETERMINE THE LEVEL OF CONTAMINATION IN THE RIVER AND THE INPUTS OF TOXIC SUBSTANCES FLOWING FROM DIFFERENT SOURCES. THE HYDRODYNAMICS AND TRANSPORTATION OF CONTAMINANTS IN THE ST. LAWRENCE ARE OF PARTICULAR INTEREST, ESPECIALLY IN LAC SAINT-FRANÇOIS. THE PRELIMINARY FINDINGS IN A PROFILE OF THE LAKE'S SEDIMENT BEDS SUGGEST THAT LAC SAINT-FRANÇOIS ACTS AS A TEMPORARY RETENTION BASIN FOR CONTAMINATED SEDIMENTS. APART FROM THESE RESULTS, PLANS ARE BEING DRAWN FOR A MORE INTENSIVE SAMPLING PROJECT FROM LAC SAINT-LOUIS TO LAC SAINT-PIERRE.

## THE DYNAMICS OF BED SEDIMENTS

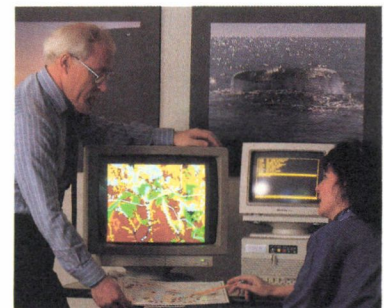
IN THE ST. LAWRENCE RIVER, 90 PERCENT OF THE TRANSPORTATION OF CONTAMINANTS OCCURS IN THE DISSOLVED PHASE. HOWEVER, THE PARTICULATE PHASE REMAINS IMPORTANT FOR THE TRANSPORTATION OF METALS AND CERTAIN HYDROPHOBIC ORGANIC CONTAMINANTS. IN FACT, THE CONCENTRATIONS OF CONTAMINANTS ADSORBED IN THE PARTICULATE PHASE ARE UP TO 100,000 TIMES GREATER THAN THOSE ADSORBED IN THE DISSOLVED PHASE. SUSPENDED SOLIDS CAN SETTLE AND ACCUMULATE IN ZONES WHERE HYDRODYNAMIC CONDITIONS PERMIT.

ONCE DEPOSITED, THE CONTAMINATED SEDIMENTS REMAIN A SOURCE OF CONTAMINATION TO THE ECOSYSTEM. BIOLOGICAL PROCESSES TRANSFER THE CONTAMINANTS TO HIGHER LEVELS IN THE FOOD CHAIN. PHYSICAL PROCESSES CAN AGAIN RETURN UPPER LAYERS OF SEDIMENTS TO SUSPENSION IN THE WATER BODY AND THE ADSORBED CONTAMINANTS MAY AGAIN BECOME BIOLOGICALLY AVAILABLE. IN AN EFFORT TO EVALUATE THE NATURE AND IMPORTANCE OF SUCH CONTAMINATION AND TO STUDY THE DYNAMICS OF SEDIMENTS, THE ST. LAWRENCE CENTRE UNDERTOOK A PILOT STUDY OF LAC SAINT-FRANÇOIS IN 1989.

THE THREE-DIMENSIONAL APPROACH ADOPTED BY THE SEDIMENT CHARACTERIZATION STUDY HAS REVEALED HOW THIN THE RECENT SEDIMENTARY BED IS AND THE NATURE OF THE HETEROGENEOUS SPATIAL DISTRIBUTION OF THE DEPOSITS. THE SHALLOW SEDIMENTARY COVER IS GENERALLY STABILIZED BY MACROPHYTE PLANT GROWTH AT THE UPPER END OF THE LAKE, WHILE THE LOWER PART IS COVERED BY BEDS OF UNDERWATER PLANTS.

THE MACROPHYTE ZONES SEEM TO EXERT AN IMPORTANT CONTROL IN TRAPPING SUSPENDED SOLIDS AND STABILIZING SEDIMENTARY DEPOSITS. SATELLITE READINGS IN SPRING, SUMMER AND FALL HAVE BROUGHT TO LIGHT VARIATIONS OVER TIME IN THE CONCENTRATIONS OF SUSPENDED SOLIDS AND IN THE TRANSPORTATION PATTERN OF THE LATTER, WHICH CORRESPONDS TO THE SEASONAL EVOLUTION OF MACROPHYTE ZONES AND BEDS OF UNDERWATER PLANTS. THE SEASONAL HYDROLOGICAL PATTERNS ALSO HAVE AN EFFECT ON THE CONCENTRATIONS OF SUSPENDED SOLIDS.

SEVERAL PREVIOUS STUDIES ON THE CHARACTERIZATION OF CONTAMINATED SEDIMENTS HAVE SUGGESTED THAT THEY WERE UNSTABLE, BOTH IN A MEDIUM-TERM AND IN A LONG-TERM SENSE, IN THE ST. LAWRENCE LAKES. MEASUREMENTS TAKEN OF THE ACTIVITY OF THE RADIO-ISOTOPES  $^7\text{Be}$ ,  $^{137}\text{Cs}$  AND  $^{210}\text{Pb}$  DURING A PRELIMINARY STUDY OF LAC SAINT-FRANÇOIS ADD CREDIBILITY TO THESE ASSERTIONS. IN FACT, THESE MEASUREMENTS GAVE EVIDENCE OF A PERMANENT SEDIMENTARY BUILD-UP, WITH A NEGLIGIBLE RETURN OF SEDIMENTS TO THE SUSPENDED STATE.



## ECOTOXICOLOGY AND ORGANIC CHEMISTRY

BESIDES CONTRIBUTING TO THE NORMALIZATION OF BIO-ANALYTIC PROCEDURES FOR POLLUTION CONTROL AND COMMUNICATING THE RESULTS OF RESEARCH AND DEVELOPMENT IN ECOTOXICOLOGY, THIS PROGRAM IS CONCERNED WITH THE QUALITY CONTROL OF ANALYSES CARRIED OUT BY PRIVATE LABORATORIES WITHIN THE FRAMEWORK OF THE INDUSTRIAL EFFLUENTS CHARACTERIZATION AND FEDERAL SITE CLEAN-UP PROGRAMS. IN ORDER TO SELECT THE BIO-ANALYTIC TOOLS MOST LIKELY TO IMPROVE THE EFFICIENT CONTROL OF THE 50 PRIORITY SOURCES OF LIQUID INDUSTRIAL WASTE, THE PROGRAM HAS CARRIED OUT AN ECOTOXICOLOGICAL EVALUATION OF SIX OF THE INDUSTRIAL WASTE SAMPLES IN QUESTION. WORK HAS ALSO BEEN CARRIED OUT TO DEVELOP NEW ANALYTICAL TOOLS USING BIO-INDICATORS.

### ECOTOXICOLOGICAL EVALUATION OF LIQUID INDUSTRIAL WASTES

EVALUATIONS WERE CONDUCTED ON LIQUID WASTE IN SIX INDUSTRIAL PLANTS, USING THE ECOTOXICOLOGICAL APPROACH DEVELOPED IN THE ST. LAWRENCE CENTRE LABORATORIES. THIS APPROACH HAS MADE IT POSSIBLE TO MEASURE THE EFFECTS OF THE WASTE AT THREE LEVELS: LETHAL (CAUSING DEATH), SUB-LETHAL (INHIBITED GROWTH AND LUMINOSITY, ENERGETIC STRESS) AND CHRONIC (INHIBITED REPRODUCTION, GENOTOXICITY). RESULTS ARE EXPRESSED IN UNITS OF TOXICITY (UT). RESEARCHERS THEN IDENTIFIED THE TOXIC SUBSTANCES MOST LIKELY TO EXPLAIN THE OBSERVED EFFECTS. THE FOLLOWING ARE THE RESULTS OF EACH EVALUATION.

**PETROMONT (VARENNES):** LETHAL, SUB-LETHAL AND CHRONIC EFFECTS ARE IN GENERAL VERY WEAK. ONLY THE GROWTH BY WEIGHT AMONG FISH HAS BEEN AFFECTED (14.3 UT). AMMONIUM NITRATE HAS BEEN FOUND IN CONCENTRATIONS SUFFICIENT TO EXPLAIN THESE RESULTS.

**NACAN (BOUCHERVILLE):** LETHAL, SUB-LETHAL AND CHRONIC EFFECTS ARE VERY MARKED (OVER 10 UT). AMMONIA, SUSPENDED SOLIDS, ZINC AND CYANIDES ARE IDENTIFIED AS MAJOR SOURCES OF TOXICITY. THE SAMPLE ALSO CONTAINS GENOTOXIC SUBSTANCES. AFTER THE BIODEGRADATION TEST (5 DAYS), TOXICITY DECREASED BY 40% TO 70%, AND NO GENOTOXICITY WAS OBSERVED.

**KRUGER (TROIS-RIVIÈRES):** SUB-LETHAL (8.8 TO 14.3 UT) AND CHRONIC (14.3 UT) EFFECTS ARE OBSERVED. RESINOUS ACIDS AND ALUMINUM ARE IDENTIFIED AS MAJOR SOURCES OF TOXICITY. THE SAMPLE CONTAINS GENOTOXIC PROTOMUTAGENS SUSCEPTIBLE TO ACTIVATION BY ON-LOADING

OF ANIMAL OR VEGETABLE ENZYMES. AFTER THE BIODEGRADATION TEST, TOXICITY DECREASES BY ABOUT 55%, AND NO GENOTOXICITY IS REVEALED.

**CONSOLIDATED BATHURST (TROIS-RIVIÈRES):** LETHAL (7.1 UT), SUB-LETHAL (2.5 TO 7.2) AND CHRONIC (25 UT) EFFECTS ARE OBSERVED. WHILE THE CHEMICAL ANALYSIS IS DOUBTFUL AND INCOMPLETE, THE ORDER OF MAGNITUDE OF THE CHEMICAL DEMAND FOR OXYGEN (OVER 1,000 MG/L) AND THE NON-NEGLECTIBLE PRESENCE OF SUSPENDED MATERIALS, OILS AND GREASES SUGGEST AN IMPORTANT CONTRIBUTION BY THESE PARAMETERS TO THE TOXICITY OF THE WHOLE. THE SAMPLE CONTAINS GENOTOXIC PROTOMUTAGENS. AFTER THE BIODEGRADATION TEST, NEITHER TOXICITY NOR GENOTOXICITY WAS OBSERVED.

**REYNOLDS (BAIE-COMEAU):** ONLY THE GROWTH BY WEIGHT OF FISH IS INHIBITED (14.3 UT). THE SAMPLE ALSO CONTAINS GENOTOXIC SUBSTANCES. CHEMICAL ELEMENTS MUST BE CONSIDERED AS A WHOLE TO EXPLAIN THE OBSERVED EFFECTS, SINCE NO ELEMENT IS FOUND IN SUFFICIENT CONCENTRATION TO PRODUCE A LETHAL, SUB-LETHAL OR CHRONIC TOXICITY.

**LOCKWELD (CANDIAC):** SUB-LETHAL (14.3 UT) AND CHRONIC (7.1 UT) EFFECTS ARE OBSERVED. SEVERAL METALS, SUCH AS ZINC, CHROMIUM, LEAD, COPPER AND CADMIUM ARE FOUND IN CONCENTRATIONS SUFFICIENT TO EXPLAIN THE OBSERVED EFFECTS. THE SAMPLE CONTAINS GENOTOXIC PROTOMUTAGENS.



## STATE OF THE ENVIRONMENT AND ECOSYSTEMS

FOR THE EVALUATION OF ECOSYSTEMS, EIGHT DISTINCT MAJOR BIO-GEOGRAPHIC REGIONS HAVE BEEN SUCCESSFULLY IDENTIFIED FROM LAC SAINT-FRANÇOIS TO THE GULF. APPROPRIATE METHODS OF BIO-EVALUATION HAVE ALSO BEEN SELECTED FOR THE SURVEY OF THE QUALITY OF ECOSYSTEMS. RESEARCH ON BIO-INDICATORS AND THE USE OF MULTIPLE-VARIABLE ANALYSIS HAVE PERMITTED US TO ACHIEVE NOTICEABLE PROGRESS IN RAPID DATA PROCESSING

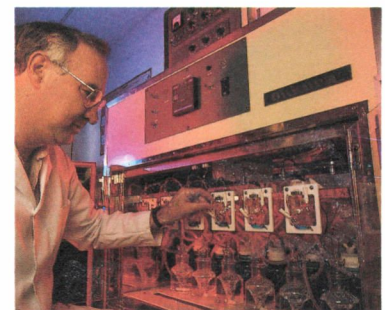
AND IN UNDERSTANDING THE RELATIONS BETWEEN ORGANISMS AND THEIR MILIEUS. BIO-INDICATORS HAVE BEEN SUCCESSFULLY USED TO EVALUATE THE STATE OF HEALTH OF PARTICULAR SPECIES, OR TO GAUGE THE IMPACT OF THE EVENTUAL REDUCTION OF LIQUID TOXIC WASTE ON A CONTAMINATED ENVIRONMENT. FISHERIES AND OCEANS CANADA HAS DEVELOPED AND IMPLEMENTED VARIOUS METHODS TO BE USED AS INDICATORS FOR THE HEALTH OF FISH, AS WELL AS FOR THE TOXIC EFFECTS OF CHEMICAL PRODUCTS IN THE RIVER.

FOR ITS PART, THE DIVISION OF THE ST. LAWRENCE CENTRE CONCERNED WITH UNDERSTANDING THE STATE OF THE ENVIRONMENT HAS WORKED ON PRODUCING SEVERAL DOCUMENTARY ACCOUNTS OF THE STATE OF THE RIVER ENVIRONMENT AND HUMAN ACTIVITIES ALONG THE RIVER. THE CHAPTER ON THE ST. LAWRENCE RIVER, WHICH FORMS A PART OF THE NEXT REPORT ON THE STATE OF THE ENVIRONMENT IN CANADA, HAS BEEN DELIVERED, EDITED AND INTEGRATED WITH THIS NATIONAL SURVEY. A GENERAL PORTRAIT OF THE RIVER HAS ALREADY BEEN PUBLISHED IN *L'ESCALE* MAGAZINE, AND THREE OTHER DOCUMENTS ARE BEING PREPARED. THESE COVER THE 50 PRIORITY INDUSTRIAL PLANTS, TOXIC SUBSTANCES IN THE RIVER AND MARITIME TRANSPORTATION RESPECTIVELY.

## ENVIRONMENTAL ATLAS OF THE ST. LAWRENCE

IN SEPTEMBER 1989, THE ST. LAWRENCE CENTRE WORKED OUT A FINANCING AGREEMENT WITH THE DEPARTMENT OF GEOGRAPHY AT LAVAL UNIVERSITY FOR THE PRODUCTION OF AN ENVIRONMENTAL ATLAS OF THE ST. LAWRENCE RIVER. THIS PROJECT IS PART OF THE STATE OF THE ENVIRONMENT REPORTING ON THE RIVER, IN WHICH UP-TO-DATE PORTRAITS OF THE DIFFERENT FACETS OF THE RIVER WILL DEMONSTRATE THE EVOLUTION OF ITS ENVIRONMENT.

THE ATLAS SEEKS FIRST AND FOREMOST TO INFORM, TO CREATE AWARENESS AND TO INSTRUCT STUDENTS, RESEARCHERS, DECISION-MAKERS, NON-GOVERNMENTAL ORGANIZATIONS, GROUPS INTERESTED IN THE CONDITION OF THE RIVER, AND OF COURSE THE GENERAL PUBLIC. IT WILL ENABLE READERS TO FAMILIARIZE THEMSELVES WITH THE RESOURCES AND LIMITATIONS OF THE RIVER.



THE ATLAS TAKES AN APPROACH THAT EMPHASIZES A GLOBAL CONCEPT OF THE ENVIRONMENT. READERS WILL FIND SYNTHETIC MAPS WHICH COMBINE VARIOUS ASPECTS OF THE STATE OF THE ENVIRONMENT, INSTEAD OF THE SEPARATE THEMATIC MAPS FOUND IN MOST TRADITIONAL ATLASES.

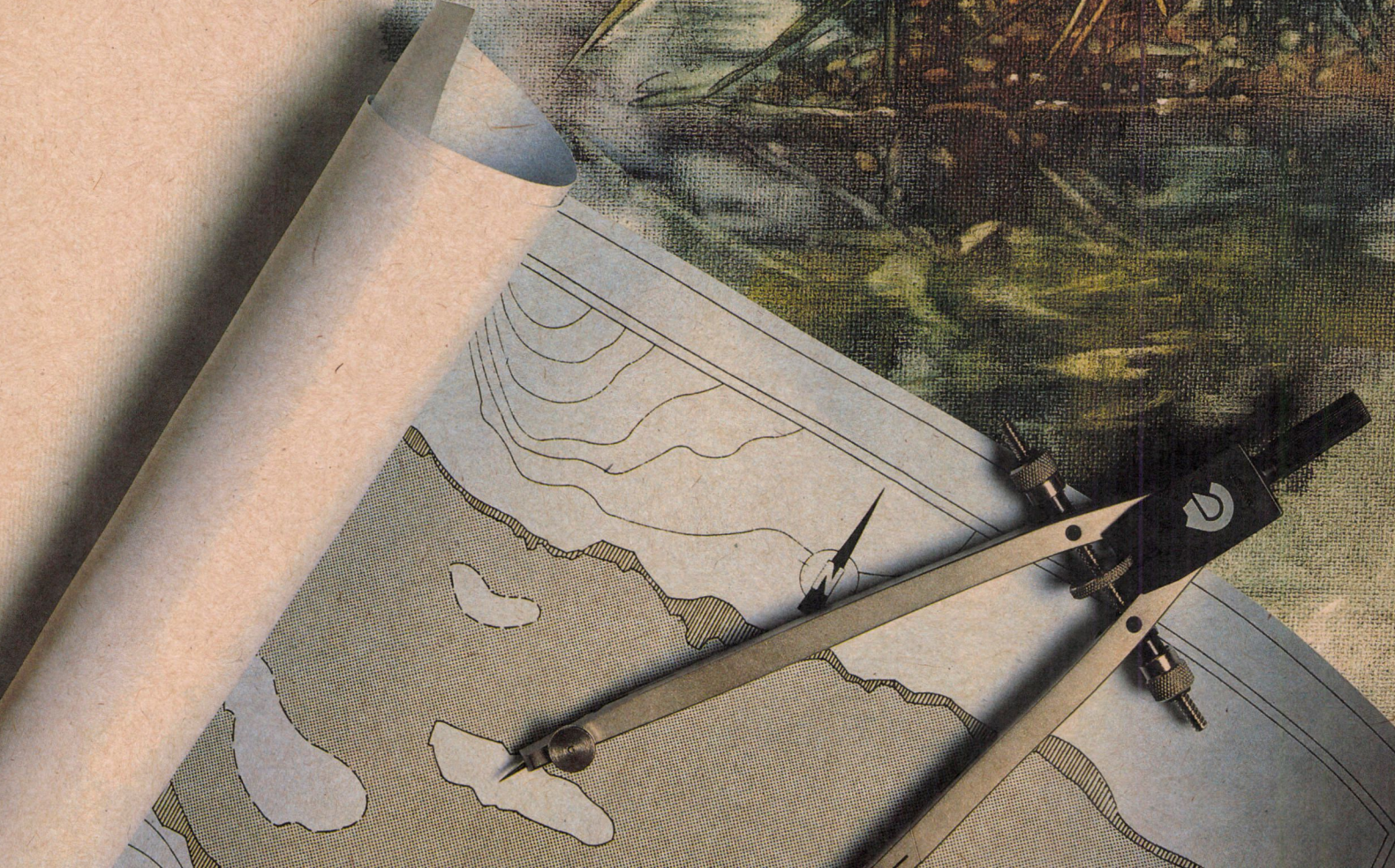
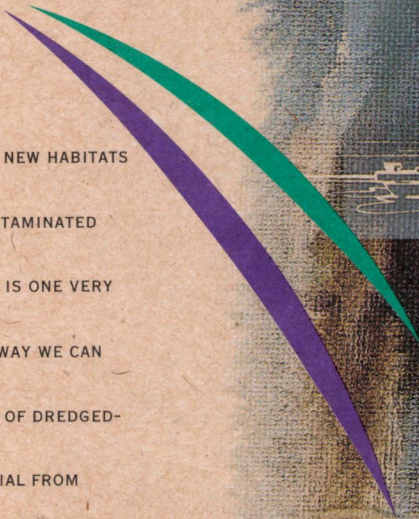
WORK TO DATE HAS BEEN CONCENTRATED ON THE DEVELOPMENT OF AN INTEGRATED THEMATIC STRUCTURE FOR THE ATLAS. WHETHER IN ITS GENERAL CONCEPTION, OR IN ITS DESIGN, OR IN THE PREPARATION OF ITS THIRTY-SOME PROPOSED PLATES, THE SUCCESS OF THE ATLAS PROJECT DEPENDS BOTH ON CONSULTATION WITH THE PROFESSIONALS ENGAGED IN THE MANAGEMENT OF THE RIVER, AND ON EXPERTS WHO CAN VERIFY AND PROCESS THE INFORMATION THE ATLAS CONTAINS. NEW ELECTRONIC TOOLS ARE NOW IN PLACE TO SUPPORT THE WORK OF PROCESSING, EVALUATION, SYNTHESIS AND VERIFICATION OF INFORMATION.

THE ATLAS WILL BE BASED ON TWO INTERACTING AXES. ONE IS A SYSTEMIC VISION, WHICH WILL ENABLE THE

IDENTIFICATION OF SIX MAJOR COMPONENTS FOR THE PRODUCTION OF A PHYSICAL, ECOLOGICAL, AND SOCIO-ECONOMIC PICTURE SHOWING THE USES OF THE RIVER ENVIRONMENT AND THEIR REPERCUSSIONS, AS WELL AS PROFILING PROTECTION ACTIVITIES. THE OTHER IS A THEMATIC VISION WITHIN EACH OF THESE COMPONENTS, WHICH WILL ENABLE US TO OBTAIN A RELIABLE PICTURE OF THE RIVER AS A FUNCTION OF PARTICULAR THEMES, WITH SUFFICIENT FLEXIBILITY IN VISUAL PRESENTATION AS TO MAKE IT BOTH PEDAGOGICALLY SOUND AND AESTHETICALLY ATTRACTIVE.

**RESTORATION**

CREATING NEW HABITATS  
FROM CONTAMINATED  
SEDIMENT IS ONE VERY  
POSITIVE WAY WE CAN  
MAKE USE OF DREDGED-  
UP MATERIAL FROM  
OTHER ENVIRONMENTAL  
ACTIVITIES.



## RESTORATION OF FEDERAL SITES

AMONG OTHER ACCOMPLISHMENTS, THE FEDERAL SITE CLEAN-UP PROGRAM HAS CARRIED OUT AN INVENTORY OF CONTAMINATED SITES ON THE ST. LAWRENCE, INDICATING THAT 65 AQUATIC SITES, INCLUDING SOME BELONGING TO THE FEDERAL GOVERNMENT, ARE ACTUALLY OR POTENTIALLY CONTAMINATED. IN YEAR III, THE PROGRAM WILL SET PRIORITIES FOR FUTURE ACTION. SEDIMENT CHARACTERIZATION STUDIES ARE NOW BEING CONDUCTED IN THE HARBOURS OF MONTREAL, TROIS-RIVIÈRES AND QUEBEC CITY. PLANS WILL THEN BE WORKED OUT FOR THE DECONTAMINATION OF EACH HARBOUR. METHODS AND EQUIPMENT USED IN DREDGING THE RIVER HAVE BEEN CHANGED, AND GUIDELINES HAVE BEEN ESTABLISHED TO GUARANTEE THE QUALITY OF SEDIMENT CHARACTERIZATION AND ANALYSIS. TWO DATA BASES HAVE ALSO BEEN CREATED FOR THE USE OF PARTICIPANTS WORKING ON THE STUDY AND MANAGEMENT OF RIVERBED SEDIMENTS.

### THE LACHINE CANAL

THE LACHINE CANAL DECONTAMINATION PROJECT IS IN RESPONSE TO POPULAR DEMAND TO MAKE THIS WATERWAY ACCESSIBLE ONCE AGAIN TO THE PEOPLE LIVING NEARBY. EVER SINCE 1978, RECREATIONAL USE OF THE CANAL WATERS HAS BEEN FORBIDDEN BECAUSE OF VERY HIGH LEVELS OF CONTAMINATION. THE PROJECT IS INTENDED TO ENHANCE THE HISTORICAL AND RECREATIONAL POTENTIAL OF THE CANAL.

GIVEN THE NATURE OF THE PROBLEM, AND CONSIDERING THE LOCATION OF THE CANAL IN SO CONCENTRATED AN URBAN SETTING, RESEARCH INTO A SOLUTION TO ITS DECONTAMINATION MUST TAKE INTO ACCOUNT AN IMPORTANT NUMBER OF FACTORS: TECHNICAL, ENVIRONMENTAL, ECONOMIC, LEGAL AND SOCIAL. THERE ARE FOUR POSSIBLE WAYS TO ATTACK THE PROBLEM, DEPENDING ON THE FORTHCOMING IMPACT STUDY'S FINDINGS:

- A) REMOVAL OF SEDIMENTS BY DREDGING, FOLLOWED BY ON-SITE NEUTRALIZATION
- B) REMOVAL OF SEDIMENTS BY DREDGING AND THEIR STORAGE IN A SECURE SITE AT SOME DISTANCE FROM THE CANAL
- C) STABILIZATION OF THE CANAL-BED SEDIMENTS AND COVERING THEM WITH A MEMBRANE AND A GRANULAR MATERIAL
- D) ENCAPSULATION OF ALL SEDIMENTS IN SECURITY CELLS INSIDE THE BANKS OF THE CANAL

IN ORDER TO BECOME AWARE OF PUBLIC OPINION ON THE PRINCIPAL CONSTRAINTS IN REALIZING THE PROJECT, AS WELL AS TO GIVE DIRECTION TO ITS FORTHCOMING IMPACT STUDY, THE CANADIAN PARKS SERVICE HELD INFORMATION AND DISCUSSION SESSIONS INVOLVING VARIOUS CONCERNED GROUPS IN MAY 1989. CONDUCTING THESE PUBLIC CONSULTATIONS AT THE OUTSET HAS MADE IT POSSIBLE FOR THE PROJECT TO GO AHEAD WITH A CLEAR SENSE OF THE ISSUES AT STAKE: NOT ONLY PUBLIC CONCERNS ABOUT THE SAFETY OF THE ACTION PLANS UNDER STUDY, BUT ALSO THEIR CONCERNS ABOUT THE FUTURE OF THE CANAL, ITS DEVELOPMENT AND THE POSSIBILITY OF ITS POLLUTION AT A LATER DATE.

AT THE REQUEST OF THE CANADIAN PARKS SERVICE, A JOINT CANADA-QUEBEC COMMISSION HAS BEEN CREATED TO EXAMINE THE PROJECT ON THE ENVIRONMENTAL LEVEL AND TO ENABLE THE PUBLIC TO TAKE PART IN THE VARIOUS STAGES OF THE EVALUATION PROCESS. THIS COMMISSION WILL BEGIN ITS WORK IN THE SPRING OF 1990, DRAWING UP RECOMMENDATIONS FOR THE FORTHCOMING DECONTAMINATION OPERATIONS.

## WETLANDS RESTORATION

THIS PROGRAM IS INTENDED FIRST TO IDENTIFY AND APPLY TECHNOLOGIES FOR THE TREATMENT AND ELIMINATION OF SEDIMENTS, AND THEN TO USE THESE SEDIMENTS TO CREATE WILDLIFE HABITATS ALONG THE ST. LAWRENCE. AN INVENTORY HAS BEEN COMPLETED OF ISLANDS INHABITED BY WATERFOWL, AND THEIR CHARACTERISTICS STUDIED TO GUIDE THE USE OF SEDIMENTS FOR HABITAT IMPROVEMENT. THE PROGRAM HAS REVIEWED THE EXPERIMENTS CONDUCTED AND THE TECHNIQUES ALREADY IN USE FOR THE CONFINEMENT OF SEDIMENTS, AND HAS ESTABLISHED PRIORITIES FOR THE SITES BEST SUITED FOR IMPROVEMENT. PLANS CALL FOR THE DEVELOPMENT OF A REGIONAL STRATEGY FOR THE IMPROVEMENT OF SITES USING DREDGED-UP MATERIAL, AND TO CARRY OUT A PILOT PROJECT TO IMPROVE WILDLIFE CONDITIONS.

### EVALUATION OF RESTORATION TECHNIQUES

ONE OF THE MAJOR ACCOMPLISHMENTS OF THE PROJECT HAS BEEN THE IDENTIFICATION OF POTENTIAL USES FOR DREDGED-UP SEDIMENT FROM THE ST. LAWRENCE, WITH A VIEW TO DEVELOPING WILDLIFE PROJECTS TO COMPENSATE FOR THE LOSS OF HABITATS ALONG THE RIVER. FOUR SECTORS OF THE RIVER HAVE BEEN SET ASIDE FOR THIS KIND OF ACTIVITY: THE REGIONS OF LAC SAINT-PIERRE, BATISCAN, QUEBEC CITY AND THE BOUCHERVILLE ISLANDS.

AS A FIRST STEP, A REVIEW OF EXPERIMENTS IN OTHER COUNTRIES HAS BEEN CONDUCTED. EXISTING PUBLICATIONS HAVE BEEN CONSULTED, AND MEETINGS HAVE BEEN HELD WITH PROFESSIONALS WHO HAVE WORKED IN THIS FIELD IN NORTH AMERICA AND IN EUROPE.

THE RESULTS OF THIS RESEARCH AND OUR FIELD STUDIES HAVE LED TO AN IMPROVED UNDERSTANDING OF THE RELATIONS BETWEEN WATERFOWL AND THEIR ISLAND HABITATS IN THE ST. LAWRENCE, THEREBY MAKING IT POSSIBLE TO DEVELOP A HABITAT IMPROVEMENT METHODOLOGY USING DREDGED-UP MATERIAL.

LIGHTLY CONTAMINATED SEDIMENT, LIKE MOST OF THE SEDIMENT DREDGED UP IN THE ST. LAWRENCE CHANNEL, CAN BE USED TO CREATE ARTIFICIAL HABITATS, PROVIDED THAT THE SEDIMENT REMAINS SATURATED WITH WATER AND HELD IN PLACE BY APPROPRIATE RETAINING STRUCTURES. THERE MUST BE THE ASSURANCE, AS WELL, THAT THE DEVELOPMENTS ARE CARRIED OUT IN ZONES OF LOW HYDRAULIC ENERGY.

IN ORDER FOR THESE ARTIFICIAL ISLETS TO ATTRACT WATERFOWL, THEIR OPTIMAL SURFACE AREA SHOULD BE, STUDIES INDICATE, BETWEEN 0.5 AND 1.5 HECTARES. THE SMALLEST MUST BE CIRCULAR

AND THE LARGEST RECTANGULAR IN SHAPE. THE SLOPE OF THE ISLETS SHOULD ALSO VARY BETWEEN 1:15 AND 1:60. THE ISLETS SHOULD BE SITUATED AT LEAST 200 METRES FROM THE RIVER BANK, 100 METRES FROM OTHER ISLANDS AND TWO KILOMETRES FROM SHIPPING LANES. MOST OF THEIR SURFACE AREA SHOULD BE FLOODED EVERY SPRING.

IT IS ALSO ESSENTIAL TO HAVE VEGETATION THAT WILL HOLD THE SOIL AND CREATE FAVOURABLE NESTING CONDITIONS FOR WATERFOWL ON 75% OF THE SURFACE AREA OF THE ISLETS. PHALARIS REED SEEMS TO BE THE BEST TYPE OF SPECIES FOR THE FORMATION OF THE HIGH-WATER MEADOWS DESIRED.

IN ADDITION TO THIS, A WORKING GROUP HAS BEEN FORMED TO DEVELOP AND EVALUATE A PILOT WILDLIFE DEVELOPMENT PROJECT. THE GROUP'S WORK WILL INVOLVE THE IDENTIFICATION OF AN APPROPRIATE SITE, THE DESIGN OF THE DEVELOPMENT AND MANAGEMENT PLAN, WAYS AND MEANS OF CONSULTING THE PUBLIC, AND EVALUATION OF ITS ENVIRONMENTAL IMPACT.



## A DYNAMIC APPROACH

IN CONFORMITY WITH THE ORIGINAL ORIENTATION OF THE ST. LAWRENCE ACTION PLAN, ACTIVITIES IN YEAR II WERE GUIDED BY AN ONGOING CONCERN TO STIMULATE AND ENCOURAGE ALL FORMS OF PARTNERSHIP LIKELY TO CONTRIBUTE TO THE ACCOMPLISHMENT OF THE MISSION THAT HAS BEEN UNDERTAKEN. AT THE SAME TIME, THE POLICY OF CONTRACTING-OUT HAS BEEN ADHERED TO WHEREVER POSSIBLE, IN A WAY THAT ENCOURAGES THE GROWTH OF ADDITIONAL CANADIAN AND QUEBEC EXPERTISE IN THE PROTECTION, RESTORATION AND CONSERVATION OF THE ENVIRONMENT.

IN THE MATTER OF PARTNERSHIP, WE CAN TAKE ONLY CREDIT FOR THE ACTUAL CONCRETE RESULTS PRODUCED TO DATE BY THE COOPERATIVE GOODWILL SHOWN BY THE FEDERAL AND PROVINCIAL MINISTERS INTERESTED IN THE ATTAINMENT OF THE OBJECTIVES OUTLINED IN THE ST. LAWRENCE ACTION PLAN. IT IS CLEAR THAT THE CLOSE COLLABORATION OF GOVERNMENTAL ACTIONS WILL ENSURE THE EFFECTIVE REDUCTION OF LIQUID TOXIC WASTE IN THE RIVER AND THE CONSERVATION OF OUR NATURAL HERITAGE.

BEING FULLY AWARE OF THE STAKES INVOLVED IN CONTRIBUTIONS MADE TO THE ACTION PLAN, THOSE RESPONSIBLE FOR THE VARIOUS PROGRAMS HAVE MADE EVERY EFFORT TO ESTABLISH AND DEVELOP AN EFFECTIVE PARTNERSHIP STRUCTURE WITH THE SCIENTIFIC COMMUNITY, THE UNIVERSITY MILIEU, PRIVATE ENTERPRISE AND NON-GOVERNMENTAL ORGANIZATIONS DEVOTED TO THE CONSERVATION AND PROTECTION OF THE ENVIRONMENT.

WE CONTINUE TO PROFIT INCREASINGLY FROM THE STRATEGY ADOPTED BY THE ACTION PLAN. TOGETHER WE HAVE COMBINED AND FOCUSED OUR RESOURCES AND WE ARE TAKING FULL ADVANTAGE OF THE RESULTING SYNERGY. AT THE END OF YEAR II, THE ACTION PLAN'S IMPLEMENTATION HAS BEEN REINFORCED BY THE COOPERATIVE WORK ACCOMPLISHED WITHIN A LARGE NETWORK THAT INCLUDES ALL OUR PRINCIPAL

UNIVERSITY, INDUSTRY, COMMUNITY AND GOVERNMENT PARTNERS ENGAGED IN THE PURSUIT OF OUR STATED COMMON OBJECTIVES.

AS RESULT OF THE CONTRACTING-OUT POLICY ADVOCATED BY THE ACTION PLAN, A SIGNIFICANT NUMBER OF PROFESSIONALS AND PRIVATE FIRMS HAVE TAKEN ADVANTAGE OF THE OPPORTUNITY TO IMPROVE THEIR EXPERTISE IN THE FIELD OF THE ENVIRONMENT BY CARRYING OUT CONTRACTS AWARDED TO THEM WITHIN THE FRAMEWORK OF THE ACTION PLAN. BY ENCOURAGING THE DEVELOPMENT OF ENVIRONMENTAL ACTION EXPERTISE IN QUEBEC AND IN CANADA, THE ACTION PLAN PROVIDES THE OPPORTUNITY TO CREATE A STRONG NUCLEUS OF ENVIRONMENTAL INDUSTRIES AND CONSULTING SERVICES WHICH CAN BE EXPORTED ELSEWHERE.

## THE FEDERAL-PROVINCIAL ACTION TEAM

ONE OF THE MOST POSITIVE EXAMPLES OF THE PARTNERSHIP AND COOPERATION BETWEEN THE GOVERNMENTAL PARTICIPANTS IS IN THE CREATION OF A FEDERAL-PROVINCIAL ACTION TEAM RESPONSIBLE FOR GETTING THE CLEAN-UP OF THE INDUSTRIAL EFFLUENTS TARGETED IN THE "PROTECTION" COMPONENT UNDER WAY.

THIS TEAM WAS CREATED IN JUNE 1989, AS A DIRECT RESULT OF THE HISTORIC CANADA-QUEBEC AGREEMENT. THE TEAM IS MADE UP OF 25 EXPERTS FROM THE FEDERAL DEPARTMENT OF THE ENVIRONMENT, THE *MINISTÈRE DE L'ENVIRONNEMENT DU QUÉBEC* AND THE PRIVATE SECTOR. WHATEVER THEIR OFFICIAL CONNECTIONS, THESE PROFESSIONALS ARE ALL SPECIALISTS IN ONE OR ANOTHER OF THE RELEVANT INDUSTRIAL SECTORS, SUCH AS PULP AND PAPER, METALLURGY, OR PETRO-CHEMICALS. TOGETHER, THEY SHARE THE TASK OF ESTABLISHING COMPULSORY DECONTAMINATION PROGRAMS FOR THE 50 PRIORITY INDUSTRIAL PLANTS.

THE ACTUAL MANDATE OF THE FEDERAL-PROVINCIAL ACTION TEAM, RESPONSIBLE TO THE DIRECTOR OF THE INDUSTRIAL WATER CLEAN-UP PROGRAM OF THE *MINISTÈRE DE L'ENVIRONNEMENT DU QUÉBEC*, IS TO WORK WITH THE INDUSTRIES TARGETED BY THE ST. LAWRENCE ACTION PLAN IN ORDER TO MAKE SURE THAT ALL EFFLUENTS ARE DECONTAMINATED BEFORE THEY ARE DISCHARGED INTO THE RIVER.

TO DO THIS, THE ACTION TEAM IS BUSY COLLECTING AND COMPILING INFORMATION FOR EACH INDUSTRIAL PLANT. THIS INFORMATION DEALS, AS PRECISELY AS POSSIBLE, WITH INDUSTRIAL PROCEDURES, SEWAGE NETWORKS, WASTE WATER, PRESENT-DAY TREATMENT SYSTEMS, PROTOCOLS OF AGREEMENT ALREADY SIGNED AND AUTHORIZATION CERTIFICATES.

FOR PURPOSES OF EFFICIENCY, AS WELL AS TO SIMPLIFY CONTACT WITH THE INDUSTRIES INVOLVED, THE ACTION TEAM HAS DECIDED TO INTERACT WITH THE 50 PRIORITY INDUSTRIAL PLANTS THROUGH "ONE-WAY ACCESS". ACCORDING TO PROVINCIAL ACTION MECHANISMS ALREADY ESTABLISHED, INTERVENTIONS WITH THE 50 INDUSTRIAL PLANTS WILL BE CARRIED OUT BY SPECIALISTS ALREADY IN PLACE IN EXISTING PROGRAMS, ESPECIALLY IN THE *MINISTÈRE DE L'ENVIRONNEMENT DU QUÉBEC* WATER CLEAN-UP PROGRAMS.

IN CARRYING OUT ITS MANDATE, THE FEDERAL-PROVINCIAL ACTION TEAM IS ALSO SUPPORTED BY A TECHNICAL TEAM, WHOSE DUTIES INCLUDE ELECTRONIC DATA-PROCESSING, CONDUCTING ENVIRONMENTAL STUDIES, AND IDENTIFYING SOLUTIONS AND NEEDS FOR TECHNOLOGICAL RESEARCH AND DEVELOPMENT.

A SPECIAL GROUP OF EXPERTS IN ENVIRONMENTAL STUDIES IS SETTING THE NORMS AND GOALS TO BE ATTAINED FOR LIQUID INDUSTRIAL WASTE. THIS GROUP IS STUDYING THE LOCAL IMPACT ZONE OF EFFLUENTS AND PRODUCING A DETAILED REPORT ON TOXIC LIQUIDS DISCHARGED INTO THE RIVER. THIS WORK IS BEING CARRIED OUT IN COLLABORATION WITH THE TECHNICAL TEAM, WHICH, FOR ITS

PART, IS ESTABLISHING THE TECHNICAL AND ECONOMIC FEASIBILITY OF PROPOSED DECONTAMINATION MEASURES AS WELL AS THE INSTALLATION OF NEW MANUFACTURING TECHNOLOGIES.

THE ST. LAWRENCE CENTRE IS PROVIDING THE FEDERAL-PROVINCIAL ACTION TEAM WITH THE NECESSARY SUPPORT FOR RESEARCH AND DEVELOPMENT, LABORATORY ANALYSES, QUALITY CONTROL AND ECOTOXICOLOGICAL EVALUATIONS.

DURING YEAR III, THE PRINCIPAL WORK OF THE ACTION TEAM WILL BE DIRECTED TOWARDS THE CHARACTERIZATION OF EFFLUENTS, THE ESTABLISHMENT OF CORRECTIVE MEASURES BASED ON ENVIRONMENTAL OBJECTIVES AND THE SIGNING OF CLEAN-UP PLANS FOR THE INDUSTRIAL PLANTS THAT HAVE NOT YET ENTERED INTO SUCH PROGRAMS. THE REVISION OF THE REGULATIONS FOR PULP AND PAPER MILLS WILL ALSO BE A PRIORITY FOR THE ACTION TEAM.



## CONSERVATION: THE PRIORITY OF YEAR III

ALTHOUGH THE RESULTS OBTAINED TO DATE HAVE BEEN MORE THAN SATISFACTORY, A GREAT DEAL REMAINS TO BE DONE BETWEEN NOW AND 1993, IF THE ST. LAWRENCE ACTION PLAN IS TO ACHIEVE ITS GOALS. IT IS IMPORTANT TO REMEMBER THAT THE ULTIMATE OBJECTIVE OF ALL THE EFFORTS OF THE ACTION PLAN IS THE CONSERVATION OF THE RIVER AS A LIVING ENVIRONMENT. IN THIS SENSE, THE ACTIVITIES CONNECTED WITH THE "CONSERVATION" COMPONENT ARE OF PRIME IMPORTANCE. THAT IS THE REASON WHY MANAGEMENT HAS DECIDED TO MAKE THIS COMPONENT THE PRINCIPAL THEME OF ALL COMMUNICATIONS DURING 1990-1991.

IT WILL BE HELPFUL TO REVIEW THE OBJECTIVES OF THE THREE PROGRAMS ATTACHED TO THE "CONSERVATION" COMPONENT AT THE OUTSET. THE POINT TO BE MADE IS THAT CONCRETE MEANS ARE BEING EMPLOYED TO GUARANTEE THE CONSERVATION OF THE RIVER, WITH ANTICIPATED RESULTS THAT CAN BE MEASURED.

## CREATION OF A MARINE PARK

BASED ON THE AGREEMENT CONCLUDED BETWEEN THE FEDERAL AND PROVINCIAL GOVERNMENTS, THE PROJECT FOR THE CREATION OF A MARINE PARK AT THE MOUTH OF THE SAGUENAY WILL UNDERGO SIGNIFICANT DEVELOPMENT DURING YEAR III.

SIX MONTHS FROM NOW, AS A FIRST STEP, THE TWO GOVERNMENTS WILL PROPOSE THE ADOPTION OF LEGISLATIVE OR REGULATORY MEASURES NECESSARY FOR THE CREATION OF THE MARINE PARK, AND WILL ACCURATELY ESTABLISH ITS PROVISIONAL BOUNDARIES. SUBSEQUENT PUBLIC CONSULTATIONS WILL HELP TO SET THE DEFINITIVE BOUNDARIES. ULTIMATELY, THE LOCAL POPULATION WILL BE CALLED UPON TO PROVIDE OPINIONS AND ADVICE ON THE PARK'S DEVELOPMENT.

IN ANOTHER AREA, THE SETTING UP OF A COORDINATING COMMITTEE WILL GUARANTEE COMPLEMENTARINESS OF ACTION AT BOTH LEVELS OF GOVERNMENT, AS WELL AS THE SHARING OF INFRASTRUCTURES AND EQUIPMENT, PRESENT AND PLANNED. THIS FORMULA, A FIRST IN CANADA, OPENS THE DOOR TO A PROTECTION AND CONSERVATION POLICY FOR PLANT AND WILDLIFE RESOURCES THAT ARE UNIQUE. WITH A TOTAL INVESTMENT OF \$9.5 MILLION BETWEEN NOW AND 1993, BOTH GOVERNMENTS ARE PREPARING TO IMPROVE THE CONDITION OF ALL RESOURCES INSIDE THIS TERRITORY, WHILE MAKING THEM MORE ACCESSIBLE TO THE PUBLIC AT THE SAME TIME.

## PROTECTION OF ENDANGERED SPECIES

IN RESPONSE TO THE PUBLICATION OF THE SURVEY OF ENDANGERED BIRDS IN QUEBEC, PLANS WILL BE MADE ABOVE AND BEYOND THOSE WHICH ALREADY EXIST AT THE NATIONAL LEVEL FOR THE REESTABLISHMENT OF PRIORITY SPECIES. PARTICULAR MENTION MAY BE MADE OF THE MIGRANT LOGGERHEAD SHRIKE, WHICH ALREADY APPEARS ON THE LIST OF PRIORITY SPECIES TARGETED IN THE NATIONAL PLANS. THE PROGRAM WILL ALSO PROVIDE A FRAMEWORK AND TECHNICAL SUPPORT FOR THE QUEBEC COMMITTEE FOR THE REESTABLISHMENT OF ENDANGERED SPECIES IN CANADA (RESIN).

THE PROGRAM WILL MEASURE THE PRODUCTIVITY OF ENDANGERED SPECIES AND WILL EVALUATE THE QUALITY OF THEIR HABITATS AS WELL. IN THIS WAY, SPECIAL ATTENTION WILL BE GIVEN TO THE HABITAT OF THE MIGRANT LOGGERHEAD SHRIKE AND TO THE PRODUCTIVITY OF THE PIPING PLOVER, AS WELL AS TO THE POSSIBILITIES OF IMPROVING THE PLOVER'S HABITAT.

THE INTRODUCTION OF THE LAW GOVERNING ENDANGERED OR VULNERABLE SPECIES WILL BE A PRIORITY FOR THE GOVERNMENT OF QUEBEC IN 1990-1991. EVENTUALLY, ALL THE DATA ACQUIRED FOR THE PRIORITY SPECIES OF THE ST. LAWRENCE WILL BE INTEGRATED WITH THE DATA BASE OF THE NATURAL HERITAGE INFORMATION CENTRE.

AT YET ANOTHER LEVEL, EFFORTS WILL BE MADE TO IMPROVE THE ENFORCEMENT OF THE FEDERAL LAW ON MIGRATORY BIRDS AND WILDLIFE. THE PROGRAM WILL CONTINUE ITS EFFORTS TO CREATE A GENERAL AWARENESS FOR THE NEED TO CONSERVE ENDANGERED BIRDS AND ANIMALS.

THE PROGRAM WILL ALSO GO AHEAD WITH ITS INVENTORY OF PRIORITY SPECIES. DURING YEAR III, THE NATIONAL FIVE-YEAR INVENTORY OF THE PEREGRINE FALCON WILL BE CONDUCTED AND IN YEAR IV, THE PROGRAM WILL TAKE PART IN THE INTERNATIONAL INVENTORY OF THE PIPING PLOVER. AT THE SAME TIME, WORK WILL BE DONE ON ITEMIZING NESTING BLACK DUCK COUPLES ALONG THE ST. LAWRENCE. IN ANOTHER AREA, THE PROGRAM WILL EVALUATE THE IMPACT OF NEW FISHING TRENDS, SUCH AS FISHING FOR FEED-STOCKS, ON MARINE BIRDS IN THE GULF. TO DO THIS, THE FEEDING HABITS OF THE FAMILY OF ALCIDAE (MURRES AND PUFFINS) WILL BE STUDIED AND USED AS INDICATORS FOR THE STATE OF THE ENVIRONMENT. AND FINALLY, THE PROGRAM WILL FOLLOW THE POPULATION DYNAMICS OF THE SMALL EASTERN AUK, IN ORDER TO DETERMINE CAUSES OF MORTALITY AND APPLY APPROPRIATE CORRECTIVE MEASURES.

AS FOR AQUATIC WILDLIFE, A FEASIBILITY STUDY WILL BE CARRIED OUT FOR THE RESTORATION OF THE STRIPED BASS AND THE RAINBOW SMELT. THE INTER-DEPARTMENTAL PLAN TO IMPROVE THE SURVIVAL OF THE ST. LAWRENCE BELUGA WILL BE CARRIED INTO ITS THIRD YEAR OF OPERATION. AMONG OTHER THINGS, AN ATTEMPT WILL BE MADE TO DETERMINE POPULATION DYNAMICS AND TO IDENTIFY THE LIMITING FACTORS. DURING YEAR IV, A REPORT WILL BE PREPARED ON THE SITUATION OF THE BELUGA POPULATION.

### HABITAT CONSERVATION

YEAR III WILL BE HIGHLIGHTED BY THE SIGNING OF AN AGREEMENT BETWEEN ENVIRONMENT CANADA AND TRANSPORT CANADA FOR THE PROTECTION OF 500 ADDITIONAL HECTARES OF HABITATS. IN THE THREE FINAL YEARS OF THE ACTION PLAN, MEASURES WILL BE TAKEN TO CONSERVE 1,000, 1,250 AND 1,250 HECTARES OF HABITATS SUCCESSIVELY. A LARGE-SCALE CONSERVATION PROGRAM WILL BE PUT FORWARD FOR HABITATS THAT ARE CRUCIAL FOR ENDANGERED PLANT AND ANIMAL SPECIES. PRIORITY WILL BE GIVEN TO THE ISLANDS IN THE ST. LAWRENCE RIVER BETWEEN CORNWALL AND LAC SAINT-PIERRE. THE MANAGEMENT OF THIS GROUP OF ISLANDS WILL INVOLVE THE JOINT PARTNERSHIP OF THE GOVERNMENTS OF CANADA AND QUEBEC, AS WELL AS INVOLVING CONSERVATION GROUPS AND, IF POSSIBLE, MUNICIPALITIES.

A PROTOTYPE SYSTEM WILL BE DEVELOPED FOR INTERPRETING GEOMATIC DATA FOR CHARACTERIZING THE HABITATS OF FISH IN THE ESTUARY. A FOLLOW-UP SYSTEM WILL ALSO BE COMPLETED ON THE ESTUARY FOR THE COASTAL HABITATS OF THREATENED FISH SPECIES.

### A COMMUNICATIONS OFFENSIVE

THE CONSERVATION OF THE ST. LAWRENCE RIVER IS A SERIOUS CONCERN FOR A LARGE SECTION OF THE POPULATION. A NUMBER OF FEDERAL AND PROVINCIAL DEPARTMENTS, AS WELL AS MANY NON-GOVERNMENTAL ORGANIZATIONS, ARE NOW TAKING PART IN THE CONSERVATION EFFORT. MEANWHILE, THE ST. LAWRENCE ACTION PLAN REMAINS ONE OF THE PRINCIPAL TANGIBLE INITIATIVES UNDERTAKEN TO DATE FOR THE PRESERVATION OF THE RIVER FROM THE HARMFUL EFFECTS OF INDUSTRIAL POLLUTION.

IN ORDER TO MAKE THE GENERAL PUBLIC AWARE OF THE RICHNESS AND FRAGILITY OF THE RIVER'S ECOSYSTEMS, MANAGEMENT INTENDS TO HIGHLIGHT YEAR III WITH INFORMATION ACTIVITIES SPREAD OVER THE WHOLE YEAR, WHICH WILL TOUCH THE VARIOUS REGIONS OF QUEBEC. THE PRINCIPAL GOAL OF THESE ACTIVITIES, DEVELOPED IN COLLABORATION WITH CONSERVATION GROUPS, WILL BE TO INFORM THE GENERAL PUBLIC OF THE STATE OF HEALTH OF THE RIVER AND ITS HABITATS, AS WELL AS THE PROBLEMS FACING THE SPECIES THAT DEPEND ON THE RIVER. THEY WILL ALSO AIM TO PROMOTE THE RATIONAL USE OF WETLANDS AND RIVER RESOURCES, WHILE FAVOURING THE CONSERVATION AND ENCOURAGING THE RESTORATION OF ENDANGERED WILDLIFE HABITATS.

TO DO THIS, THE COMMUNICATIONS ACTIVITIES OF THE ST. LAWRENCE ACTION PLAN WILL FEATURE THE RICHNESS AND BEAUTY OF THE RIVER, AS WELL AS THE MANY THREATS WHICH BURDEN THE CONSERVATION OF OUR RESOURCES. STRESS WILL ALSO BE PLACED ON THE IMPORTANCE OF THE MEASURES TAKEN BY THE FEDERAL AND PROVINCIAL GOVERNMENTS, AS WELL AS THEIR MANY PARTNERS, FOR ASSURING THE CONSERVATION OF HABITATS AND ENDANGERED SPECIES: THE CREATION OF A MARINE PARK, THE HABITATS ACQUISITION PROGRAM AND PLANS FOR THE RESTORATION OF ENDANGERED SPECIES.

## 1990-1993: OBJECTIVE AND STRATEGIES

AFTER HAVING REVIEWED THE MAJOR ACCOMPLISHMENTS IN THE "CONSERVATION" COMPONENT'S PROGRAMS, WE WILL NOW TAKE A LOOK AT THE PROGRAMS IN THE "PROTECTION", "STATE OF THE ENVIRONMENT" AND "RESTORATION" SECTIONS.

### TOXIC INDUSTRIAL WASTE REDUCTION

CONCERNING THE CLASSIFICATION OF LIQUID TOXIC WASTE FROM THE PRIORITY INDUSTRIAL PLANTS, IT WILL BE NECESSARY TO PROCEED DURING YEAR III TO THE CHARACTERIZATION, ECOTOXICOLOGICAL EVALUATION AND CONTROL SAMPLING OF THE WASTE OF SOME THIRTY PRIORITY INDUSTRIAL PLANTS, AS WELL AS AN EVALUATION OF THE ANTICIPATED REDUCTION IN WASTE FOR THEM ALL. DURING YEAR IV AND YEAR V, 15 CONTROL SAMPLINGS WILL BE UNDERTAKEN AND A SUMMARY OF THE REDUCTION IN INDUSTRIAL TOXIC WASTE WILL BE MADE FOR THE 50 PLANTS IN QUESTION.

BASED ON ENVIRONMENTAL REQUIREMENTS, WASTE DISPOSAL NORMS WILL BE ESTABLISHED FOR 30 INDUSTRIAL PLANTS IN YEAR III AND THE 20 REMAINING FACILITIES IN YEAR IV. THE COMING YEAR WILL BE DEDICATED TO EVALUATING THE DECONTAMINATION COSTS FOR THE 50 INDUSTRIAL PLANTS IN THE PROGRAM, WHILE YEAR IV WILL BE DEVOTED TO EVALUATING THE SOCIO-ECONOMIC IMPACT OF DECONTAMINATION FOR THE TWO SPECIFIC SECTORS OF PULP AND PAPER AND METALLURGY.

IN ORDER TO REDUCE THE TOXIC WASTE RELEASED BY THE 50 PRIORITY PLANTS BY 90%, THE EFFECTIVENESS OF 20 PROGRAMS ALREADY UNDER WAY WILL BE EVALUATED DURING YEAR III AND YEAR IV, AND SIMILAR PROGRAMS WILL BE INITIATED IN THE REMAINING 30 PLANTS. NEXT, THERE WILL BE A FOLLOW-UP OF THE DECONTAMINATION PROGRAMS, TO BE IMPLEMENTED IN 35 PLANTS BETWEEN NOW AND THE END OF YEAR IV, AND IN ALL 50 INDUSTRIAL PLANTS BETWEEN NOW AND THE END OF YEAR V.

### TOXIC INPUTS

DURING YEAR III, WE WILL EVALUATE THE RELATIVE IMPORTANCE OF THE FOLLOWING SOURCES: THE GREAT LAKES, THE LIQUID WASTE FROM THE 50 PRIORITY PLANTS AND THE MAJOR TRIBUTARIES. WATER AND SEDIMENT IN SUSPENSION WILL BE SAMPLED AT CORNWALL, BEAUHARNOIS, THE MAJOR BASIN AT LA PRAIRIE, REPENTIGNY, LANORAIE, AT THE LAVIOLETTE BRIDGE AND IN QUEBEC CITY. THE MOUTHS OF THE TRIBUTARIES TO LAC SAINT-PIERRE WILL ALSO BE SAMPLED, WHILE AN EVALUATION OF THE OTHER MAJOR TRIBUTARIES OF THE ST. LAWRENCE WILL BE MADE DURING YEAR IV AND YEAR V.

IN ADDITION TO THIS, A HYDRODYNAMIC MODEL OF THE LAC SAINT-PIERRE REGION WILL BE DEVELOPED TO HELP VISUALIZE THE MOVEMENT OF CONTAMINANTS IN THREE DIFFERENT HYDROLOGIC STATES. A MODEL WILL ALSO BE DEVELOPED TO ILLUSTRATE THE INDUSTRIAL WASTE PLUMES IN THE SAME REGION. BY COMBINING THIS INFORMATION WITH THE DATA WE HAVE ON RIVER USAGE, WE WILL BE BETTER ABLE TO TARGET OUR VARIOUS DECONTAMINATION ACTIVITIES.

YEAR III WILL ALSO SEE THE PHYSICO-CHEMICAL CHARACTERIZATION OF SEDIMENTS IN THE REGION BETWEEN LAC SAINT-LOUIS AND LAC SAINT-PIERRE. AFTER THIS IS DONE, ESSENTIAL COMPLEMENTARY INFORMATION WILL BE GATHERED TO ESTABLISH AN INDEX OF CONTAMINANTS FOUND BETWEEN THE GREAT LAKES AND QUEBEC CITY. THE ROLE OF BIOTICS IN THE MOVEMENT AND SPREAD OF CONTAMINANTS WILL BE EVALUATED AS WELL.

## ECOTOXICOLOGY AND ORGANIC CHEMISTRY

CERTAIN ACTIVITIES RELEVANT TO THIS PROGRAM WILL BE FOLLOWED ON A CONTINUOUS BASIS BETWEEN NOW AND 1993. ADDITIONAL ACTIVITIES INVOLVE THE PROVISION OF ANALYTICAL SERVICES FOR QUALITY ASSURANCE AND QUALITY CONTROL FOR OTHER PROGRAMS, THE NORMALIZATION OF BIO-ANALYTIC PROCEDURES FOR POLLUTION CONTROL, THE IDENTIFICATION OF THE EFFECTS OF TOXIC SUBSTANCES ON ORGANISMS IN VARIOUS LEVELS OF THE RIVER'S FOOD CHAIN, THE DEVELOPMENT OF ECOTOXICOLOGICAL TOOLS AND THE DISSEMINATION OF THE RESULTS OF ECOTOXICOLOGY RESEARCH AND DEVELOPMENT.

IN OTHER AREAS DURING YEAR III, THERE WILL BE AN ECOTOXICOLOGICAL EVALUATION OF 35 OF THE 50 PRIORITY INDUSTRIES, WITH BIOTESTING AND CONTROL STANDARDS ESTABLISHED FOR EACH ONE. THE EFFECTIVENESS OF BIOTESTING AS A CONTROL METHOD WILL BE VALIDATED AT THIS TIME. IN YEAR IV, THE RESULTS OF THE ECOTOXICOLOGICAL APPROACH WILL BE DISSEMINATED AMONG THE INDUSTRIAL PLANTS INVOLVED, IN ORDER TO MAKE THEM AWARE OF THE ADVANTAGES OF ACCEPTING BIO-ANALYTIC STANDARDS AS EXPERIMENTAL GUIDELINES. FINALLY, YEAR V WILL SEE THE EVALUATION OF THE BIO-ANALYTIC STANDARDS, ANY NECESSARY ADJUSTMENTS TO THEM AND THEIR RECOMMENDATION AS REGULATORY INSTRUMENTS.

DURING THE NEXT THREE YEARS THE PROGRAM WILL EVALUATE NOT ONLY EFFLUENTS, BUT ALSO THE DISPERSION PLUMES OF CERTAIN LIQUID INDUSTRIAL WASTE.

## STATE OF THE ENVIRONMENT AND ECOSYSTEMS

IN THE MANAGEMENT OF THE ENVIRONMENT, THE TENDENCY IS TO REPLACE THE SECTORIAL APPROACH WITH A PROGRESSIVELY MORE ECO-SYSTEMIC APPROACH. IT'S MAINLY A QUESTION OF INTEGRATING THE VARIOUS ENVIRONMENTAL COMPONENTS IN A DYNAMIC PERSPECTIVE WHICH TAKES ACCOUNT OF THE PHYSICO-CHEMICAL, BIOLOGICAL AND SOCIO-ECONOMIC ASPECTS OF THE REGION UNDER STUDY.

IN THE FRAMEWORK OF THE ST. LAWRENCE ACTION PLAN, THE ECO-SYSTEMIC APPROACH IS APPLIED THROUGH THE USE OF ZONES OF PRIORITY INTEREST (ZPIs). DURING YEAR II, A COMMITTEE OF REPRESENTATIVES FROM ENVIRONMENT CANADA AND FISHERIES AND OCEANS CANADA DEFINED THIS APPROACH, AND AGREED TO APPLY THIS CONCEPT TO INTEGRATE NEEDED INFORMATION AND ACTIONS TO ENSURE EFFECTIVE OPERATION OF THE PLAN. THE TERRITORY WAS THEN DIVIDED INTO 23 ZPIs, TAKING INTO ACCOUNT THE HYDRODYNAMICS OF THE RIVER, THE BIOGEOGRAPHIC REGIONS, AND THE SOCIO-ECONOMIC PARTICULARS OF COMMUNITIES ALONG THE RIVER.

THE OBJECTIVE OF THE ZPI APPLICATION IS TWOFOLD: TO FACILITATE THE UNDERSTANDING OF COMPLEX PHENOMENA ON A LOCAL SCALE AND TO ENABLE THE PLAN'S PARTNERS TO PARTICIPATE MORE FULLY IN THE DEFINITION OF QUALITY OBJECTIVES FOR THE ZONES IN WHICH THEY SHARE IN THE UTILIZATION OF THE RESOURCES.

A WORKING GROUP HAS BEEN FORMED AT THE ST. LAWRENCE CENTRE FOR THE PURPOSE OF CARRYING OUT THE FIRST PHASE OF THE ZPI APPLICATION. DURING YEAR III, THE GROUP WILL REVIEW THE FACTS AND ESTABLISH A DIAGNOSIS OF THE PRESENT STATE OF 16 ZPIs LOCATED ON THE ST. LAWRENCE BETWEEN

CORNWALL AND QUEBEC CITY AND ON THE SAGUENAY RIVER. THE GROUP WILL ALSO PRODUCE TECHNICAL REPORTS WHICH ASSEMBLE PHYSICO-CHEMICAL, BIOLOGICAL AND SOCIO-ECONOMIC DATA.

AN INTEGRATION EXERCISE WILL BE CONDUCTED FOR THE SECTORIAL ASPECTS OF SIX ZPIs DURING YEAR III, AND FOR SIX MORE DURING YEAR IV. THE OBJECTIVE WILL BE TO CLARIFY THE LINKS BETWEEN SOURCES OF CONTAMINATION AND OTHER TYPES OF ENVIRONMENTAL AGGRESSION, ON THE ONE HAND, AND RESOURCES TO BE IMPROVED AND APPLICATIONS FOR RECOVERY, ON THE OTHER. THIS SITUATION REPORT WILL SUGGEST QUALITY OBJECTIVES FOR EACH ZPI, AND INDICATORS FOR FOLLOWING UP ON THE EVOLUTION OF THE ZPI. A CONSULTATIVE DOCUMENT WILL THEN BE WORKED OUT FOR THE VARIOUS PARTNERS AND A CONSULTATION MECHANISM WILL BE PUT IN PLACE FOR SIX ZPIs IN YEAR III, AND FOR SIX OTHERS IN YEAR IV.

FROM THE POINT OF VIEW OF MONITORING THE QUALITY OF ECOSYSTEMS, YEAR III WILL SEE AN ANALYSIS OF PREVIOUS PILOT STUDIES WHICH WERE CARRIED OUT TO TEST, MODIFY AND SELECT BIO-INDICATORS. IN THE FOLLOWING YEARS, DEPENDING ON RESULTS OBTAINED BY THE PRELIMINARY STUDIES, WORK WILL CONTINUE IN THE DEVELOPMENT AND SELECTION OF BIO-INDICATORS. DURING YEAR V, A MONITORING NETWORK WILL BE ESTABLISHED FOR THE RIVER.

IN OTHER AREAS, THE PROGRAM WILL ESTABLISH A REFERENCE CENTRE FOR THE GENERAL PUBLIC. THIS REFERENCE CENTRE WILL DRAW ON THE BETTER PART OF THE ALREADY-DEVELOPED INFORMATION NETWORK AND ON THE CONTINUAL UPDATING OF THE DATA BASES. INFORMATION GATHERED THROUGH THE ACTIVITIES OF THE ACTION PLAN WILL ALSO BE MADE PUBLIC. DURING YEAR III, FACT SHEETS AND THEMATIC OR REGIONAL DOCUMENTS WILL BE PREPARED. THESE WILL CULMINATE IN THE PUBLICATION OF A COMPREHENSIVE STATE OF THE ENVIRONMENT REPORT IN YEAR V. OTHER PROJECTS IN YEAR III INCLUDE THE PRODUCTION OF 13 OF THE 33 PLATES FOR THE ENVIRONMENTAL ATLAS OF THE RIVER TO BE COMPLETED IN 1993.

IN ORDER TO PRODUCE A VISUALIZATION OF THE STATE OF THE ENVIRONMENT AS A WHOLE, A SOCIO-ECONOMIC DATA BASE WILL BE ESTABLISHED, WITH SPECIAL IMPORTANCE GIVEN TO THE EXPECTATIONS OF THE POPULATION ALONG THE RIVER. A PRELIMINARY LIST WILL ALSO BE DRAWN UP OF GLOBAL AND REGIONAL INDICATORS OF THE STATE OF THE ENVIRONMENT. FINALLY, THE EFFECTS OF TOXIC SUBSTANCES ON THE HEALTH OF HUMANS WILL BE EVALUATED, WITH THE HELP OF INTE-

RESTED PARTIES FROM THE HEALTH-CARE FIELD. THESE EFFORTS WILL EVENTUALLY LEAD TO THE ESTABLISHMENT OF A MONITORING NETWORK WHEN THE ACTION PLAN IS COMPLETED.

#### TECHNOLOGICAL DEVELOPMENT

THE INDUSTRIAL TECHNOLOGIES PROGRAM WILL DEVOTE ITS ENERGIES TO TWO COMPLEMENTARY ASPECTS OF ITS MANDATE. IT WILL CONTINUE TO DEVELOP AND MAKE USE OF NEW TECHNOLOGIES ADAPTED FOR THE REDUCTION OF INDUSTRIAL WASTE, TOXIC SUBSTANCES AND DANGEROUS REFUSE IN THE RIVER, AS WELL AS FOR THE CLEAN-UP AND RESTORATION OF CONTAMINATED SITES. TO ACCOMPLISH THIS, THE AGENDA FOR THE NEXT THREE YEARS WILL DEAL WITH:

- A) REVISION AND UPDATING, WITH PARTNERS, OF NEEDS, PRIORITIES AND STRATEGIC ORIENTATIONS FOR TECHNOLOGICAL DEVELOPMENT
- B) PRODUCTION OF EVALUATION TOOLS AND FOLLOW-UP ON NEW TECHNOLOGIES
- C) SIGNING COOPERATION AGREEMENTS WITH PARTNERS
- D) MAKING AN INVENTORY OF ENVIRONMENTAL TECHNOLOGIES APPROPRIATE FOR EACH INDUSTRIAL SECTOR
- E) DEMONSTRATION AND TRANSFER OF ENVIRONMENTAL TECHNOLOGIES AND THEIR APPLICATIONS FOR TOXIC SUBSTANCES, DANGEROUS WASTE, AND CONTAMINATED SOILS
- F) PRODUCTION AND DISSEMINATION OF SCIENTIFIC REPORTS DEALING WITH ENVIRONMENTAL TECHNOLOGIES

THE PROGRAM WILL ALSO ENDEAVOUR TO BRING THE INDUSTRIAL PLANTS SITUATED ALONG THE RIVER INTO THE DEVELOPMENT AND USE OF THE NEW TECHNOLOGIES. YEAR III WILL SEE A NUMBER OF

COLLOQUIA IN EACH SECTOR. THE AIM HERE WILL BE TO MAKE THOSE DEVELOPING THE TECHNOLOGIES AWARE OF THE NEEDS AND PRIORITIES AT HAND. WORKSHOPS AND SECTORIAL SYMPOSIA WILL BE ORGANIZED AS WELL, IN ORDER TO PRESENT THE TECHNOLOGIES TO THE INDUSTRIES CONCERNED. SECTORIAL COLLOQUIA WILL CONTINUE TO BE HELD IN YEAR IV. IN ADDITION, RECOMMENDATIONS WILL BE DRAWN UP WITH A VIEW TO INFLUENCING THE ADOPTION OF NORMS, STANDARDS OR ENVIRONMENTAL DIRECTIVES BASED ON THE NEW TECHNOLOGIES. FINALLY, IN YEAR V, A METHOD OF EVALUATING AND VALIDATING THE NEW TECHNOLOGIES WILL BE DISSEMINATED TO THOSE WORKING ON THEM. THE PROGRAM WILL ALSO PRODUCE AN ENVIRONMENTAL EVALUATION GUIDE FOR THE NEW TECHNOLOGIES.

EFFORTS WILL BE MADE AT THE SAME TIME, TO PROMOTE THE TRANSFER OF NEW ENVIRONMENTAL TECHNOLOGIES AND TO SUPPORT THE DEVELOPMENT OF AN ENVIRONMENTAL INDUSTRY.

#### RESTORATION OF FEDERAL SITES

OVER THE COURSE OF YEAR III, THE RESTORATION OF FEDERAL SITES PROGRAM WILL WORK OUT PRELIMINARY PLANS FOR THE DECONTAMINATION OF THE HARBOURS OF QUEBEC CITY, TROIS-RIVIÈRES AND MONTREAL. THESE PLANS WILL BE THE BASIS FOR THE DECONTAMINATION NEGOTIATIONS TO BE HELD IN YEAR IV. YEAR V WILL BE DEVOTED TO THE SCIENTIFIC SUPPORT REQUIRED FOR PUTTING THE DECONTAMINATION PLANS INTO OPERATION. FROM NOW UNTIL 1993, THE SAME PATH WILL BE FOLLOWED FOR 10 MORE FEDERAL SITES BORDERING ON THE RIVER, BEGINNING WITH THE CHARACTERIZATIONS OF SEDIMENTS DURING YEAR III.

THE PROGRAM WILL CONTINUE TO UPDATE THE DATA BANK AND THE MAP OF RIVER SEDIMENTS UNTIL 1993. IN YEAR III, GUIDES ON THE PROGRAM'S DREDGING WORK AND A REPORT ON THE REVISION OF STANDARDS AND THE EVALUATION OF SEDIMENTS WILL BE PUBLISHED. YEAR IV WILL SEE THE PRODUCTION OF GUIDES FOR THE SAMPLING AND ANALYSIS OF SEDIMENTS. FINALLY, IN YEAR V GUIDES WILL BE PUBLISHED ON BIOTESTING IN DREDGING, ON THE SELECTION OF SITES FOR THE DEPOSIT AND CONFINEMENT OF SEDIMENTS, AS WELL AS THE ENVIRONMENTAL SUPERVISION OF DREDGING PROJECTS. AS THEIR PUBLICATION PROCEEDS, THESE TOOLS WILL BE MADE AVAILABLE TO DREDGING PROJECT OPERATORS IN ORDER TO ASSIST THEM IN THEIR WORK ON THE ENVIRONMENT.

#### WETLANDS RESTORATION

AS FAR AS TECHNOLOGIES FOR THE TREATMENT AND ELIMINATION OF CONTAMINATED SEDIMENTS GO, A PILOT PROJECT FOR THE CONFINEMENT OF CONTAMINATED SEDIMENTS IN THE RIVER WILL BE CARRIED OUT IN YEAR III. THIS PROJECT WILL BE PRECEDED BY AN IMPACT STUDY, AS OUTLINED IN THE FEDERAL ENVIRONMENTAL EXAMINATION AND EVALUATION PROCESS. TO INTEGRATE THE NEEDS OF WILDLIFE WITH DEVELOPMENT PROJECTS, THE PROGRAM WILL PROMOTE THE CREATION OF HABITATS BY VARIOUS METHODS, INCLUDING THE USE OF DREDGED-UP SEDIMENT. AN ORDER OF PRIORITY WILL ALSO BE ESTABLISHED FOR OTHER SITE IMPROVEMENTS THAT MAKE USE OF SEDIMENTS. IN YEAR IV, THE PROGRAM WILL WORK WITH A DEVELOPER IN CARRYING OUT A PILOT SEDIMENT PROJECT FOR THE ENHANCEMENT OF WILDLIFE. THIS PROGRAM WILL ALSO EVALUATE THE PRINCIPAL TREATMENT TECHNIQUES FOR CONTAMINATED SEDIMENTS. YEAR V WILL BE DEVOTED TO THE EVALUATION AND

APPLICATION OF A SPECIFIC TREATMENT TECHNIQUE, CONCURRENTLY WITH THE ENVIRONMENTAL MONITORING OF THE PILOT PROJECT FOR WILDLIFE HABITAT IMPROVEMENT. CRITERIA WILL BE WORKED OUT TO GUIDE THE SELECTION, DEVELOPMENT, AND ENVIRONMENTAL MONITORING OF IMPROVEMENT PROJECTS THAT MAKE USE OF SEDIMENTS.

DURING THE NEXT TWO YEARS, STUDIES WILL BE CARRIED OUT TO ESTABLISH CRITERIA FOR THE INTRODUCTION OF CERTAIN PLANT SPECIES TYPICAL OF THE HABITATS MOST OFTEN VISITED BY WILDLIFE. EXAMPLES HERE INCLUDE THE DEVELOPMENT OF TECHNIQUES FOR THE RESTORATION AND CREATION OF CATTAIL MARSHES IN THE SECTOR OF THE SOUTH SHORE BETWEEN QUEBEC CITY AND SAINT-ROCH-DES-AULNAIES, A PILOT PROJECT FOR THE STABILIZATION OF THE SHORE AT CAP TOURMENTE AND A PILOT PROJECT FOR THE RESTORATION OF ESPARTO MARSHES BORDERING ON THE PRESENT BAY OF THE ISLE-VERTE WILDLIFE RESERVE. THESE STUDIES WILL ALLOW THE FORMULATION OF RECOMMENDATIONS FOR WILDLIFE ENHANCEMENT.

## OUR COLLECTIVE CHALLENGE

THERE CAN BE NO DOUBT THAT THE SPIRIT OF PARTNERSHIP AND THE CONTRIBUTION OF EACH ONE OF US ARE ESSENTIAL FOR THE CONSERVATION OF THE ST. LAWRENCE RIVER. THE INDIVIDUAL CAN, AND MUST, PLAY A ROLE IN THIS COLLECTIVE EFFORT BY TAKING POSITIVE AND CONCRETE STEPS, AND BY AVOIDING ANY ACTION LIKELY TO ENDANGER THE FUTURE OF THE ENVIRONMENT.

ALL THE EVIDENCE SHOWS THAT HUMAN BEINGS, BECAUSE WE ARE AT THE TOP OF THE FOOD CHAIN, ARE VERY MUCH AWARE OF AND CONCERNED WITH THE DETERIORATION OF THE WORLD'S ECOSYSTEMS. JUST LIKE ANY ENDANGERED SPECIES, WE FACE THE RISKS ASSOCIATED WITH ENVIRONMENTAL CONTAMINATION. THE CONSERVATION OF THIS GREAT RIVER WILL BE AN EXAMPLE OF WHAT WE CAN DO BY WORKING TOGETHER FOR THE GOOD OF OUR OWN AND ALL FUTURE GENERATIONS.

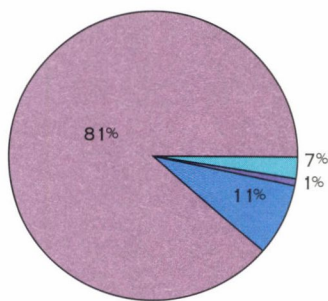
YEAR II (1989-1990)

SOURCES OF FUNDING FOR ACTIVITIES (\$000)

	DOE (C&P + CPS)	DIST	DFO	MENVIQ	MLCP	TOTAL YEAR II	GRAND TOTAL
<b>CONSERVATION</b>							
HABITAT CONSERVATION	1,545	—	150	—	365	2,060	2,467
PROTECTION OF ENDANGERED SPECIES	645	—	560	35	137	1,377	1,678
CREATION OF A MARINE PARK	34	—	—	—	—	34	34
<b>PROTECTION</b>							
TOXIC INDUSTRIAL WASTE REDUCTION	1,565	—	—	180	—	1,745	2,360
TECHNOLOGICAL DEVELOPMENT	1,534	—	—	—	—	1,534	2,027
<b>STATE OF THE ENVIRONMENT</b>							
TOXIC INPUTS	2,034	—	—	—	—	2,034	2,483
ECOTOXICOLOGY AND ORGANIC CHEMISTRY	2,317	—	—	—	—	2,317	3,002
STATE OF THE ENVIRONMENT AND ECOSYSTEMS	2,074	—	860	—	623	3,557	4,286
<b>RESTORATION</b>							
RESTORATION OF FEDERAL SITES	1,643	—	—	—	—	1,643	1,960
WETLANDS RESTORATION	213	—	280	—	—	493	583
<b>TOTAL</b>	<b>13,604</b>	<b>—</b>	<b>1,850</b>	<b>215</b>	<b>1,125</b>	<b>16,794</b>	<b>20,880</b>

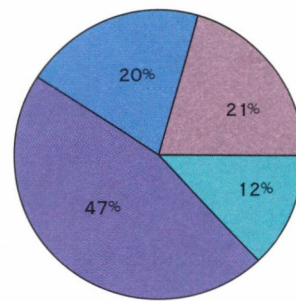
**BUDGET  
BREAKDOWN**

- DOE: DEPARTMENT OF THE ENVIRONMENT
- C&P: CONSERVATION & PROTECTION
- CPS: CANADIAN PARKS SERVICE
- DIST: DEPARTMENT OF INDUSTRY,  
SCIENCE AND TECHNOLOGY
- DFO: DEPARTMENT OF FISHERIES AND OCEANS
- MENVIQ: MINISTÈRE DE L'ENVIRONNEMENT DU QUÉBEC
- MLCP: MINISTÈRE DU LOISIR, DE LA CHASSE ET  
DE LA PÊCHE DU QUÉBEC



SOURCES OF FUNDS

- DOE
- DFO
- MENVIQ
- MLCP



BUDGET BREAKDOWN  
FOUR PROGRAMS

- CONSERVATION
- PROTECTION
- STATE OF THE ENVIRONMENT
- RESTORATION

