

### I N T U N E

#### Human health

The Surveillance Program on Shellfish-Related Illnesses has had a significant impact.

#### Biodiversity

We continue our series of articles on the results achieved under the various Phase III components with an article on the numerous successes attained in Biodiversity.

#### News in brief

Recently published : “*Le mécanique dans les céréales et le maïs – Pour une stratégie de désherbage gagnante!*” [mechanical weed control for cereal and corn crops – a winning strategy]

First St. Lawrence *Rendezvous* that will gather more than 200 SLV 2000 partners and guests working in various area.

## Shellfish-related illnesses closely monitored

*Eating shellfish poses a threat to human health because of the microbiological contaminants and marine toxins it may contain. Although several government agencies are involved in monitoring harvesting areas, cases of poisoning linked to shellfish consumption continue to be reported every year in Quebec. In 1999, to obtain a more accurate picture of these poisoning episodes, a team of researchers from Quebec City's Centre hospitalier universitaire de Québec (CHUQ) established the Surveillance Program on Shellfish-Related Illnesses (Programme de surveillance des maladies causées par les mollusques), with funding from the Human Health component of St. Lawrence Vision 2000.*

Originally designed to facilitate the reporting of poisoning cases caused by marine toxins, the Surveillance Program on Shellfish-Related Illnesses was also aimed at determining whether such poisoning cases are underreported among consumers of non-commercially harvested shellfish from the St. Lawrence. Researchers hypothesized that current environmental monitoring programs, which emphasize the safety of shellfish, were not sufficient to eliminate all risks of poisoning from marine toxins.

Indeed, marine toxins can cause illnesses such as paralytic, amnesic and diarrhetic shellfish poisoning (PSP, ASP and DSP respectively), while pathogenic bacteria, viruses and parasites—the main agents of microbiological contamination in shellfish—can produce gastrointestinal symptoms of varying severity.

Before this project, there was limited communication between Quebec's public health system and the agencies responsible for monitoring shellfish. In addition, the information available on shellfish-related illnesses was incomplete and did not allow the actual magnitude of the phenomenon in Quebec to be assessed.

“Quebec's reportable disease database (MADO) shows a few cases of illnesses caused by shellfish consumption, but cannot be used to provide an accurate picture of the

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incidence of these illnesses or the epidemiological characteristics of episodes,” explained Jean-François Duchesne, who is in charge of the project at the CHUQ’s public health research unit.

The surveillance program, which ran from the spring of 1999 to the spring of 2001, targeted shellfish consumers in the Charlevoix, North Shore and Gaspé regions and the Magdalen Islands. Its primary objectives were to:

- measure the incidence of illnesses caused by the consumption of toxic shellfish;
- improve case reporting;
- characterize the poisoning cases identified.

### A co-ordinated network

To ensure the effectiveness of the monitoring system, a special effort was needed to make clinical staff more aware of the problem of shellfish-related illnesses. “We met with close to 200 doctors and nurses at 66 health care institutions (hospitals, health centres and CLSCs) to tell them about the program and how it worked,” explained Duchesne.

Clinical staff were responsible for reporting any case of a person showing symptoms likely to be linked to the consumption of shellfish or other seafood to the regional public health department (direction de la santé publique or DSP). For each reported case, the DSP performed an epidemiological investigation, and sent the information to the Quebec Department of Agriculture, Fisheries and Food (MAPAQ) and the Canadian Food Inspection Agency (CFIA). In turn, these agencies took action

respectively with retail establishments where a food contamination problem was suspected and in the area where the shellfish was harvested, when its origin could be determined.

### Encouraging results

A total of 48 poisoning episodes affecting 66 individuals were reported. A comprehensive analysis of the information gathered on each case (symptoms, type of food consumed, epidemiological investigations, stool and blood samples, MAPAQ and CFIA investigation reports, etc.) allowed researchers to determine whether there was a link between the illness and shellfish consumption. The reported episodes were classified as follows: 3 “confirmed,” 30 “potential,” 11 “unlikely” and 4 “rejected.”

Only one of the three “confirmed” episodes involved marine toxins causing paralytic shellfish poisoning (PSP). Therefore, the results did not confirm the initial hypothesis that cases of poisoning related to marine toxins were underreported. In fact, 15 confirmed episodes of PSP were identified between 1984 and 1998, or an average of one episode per year.

Researchers emphasized the positive impact of the many public awareness campaigns that have been carried out in this area. Duchesne commented, “it does appear that people are respecting prohibitions against shellfish harvesting more faithfully, as well as following recommendations on storing and preparing shellfish.”

The two other “confirmed” episodes were microbiological in origin and involved the presence of pathogenic bacteria (*Bacillus cereus* and *Clostridium perfringens*).

In addition, 69% of “confirmed” and “potential” episodes involved the consumption of seafood obtained from a restaurant (10 episodes), grocery store (10) or fish market (3). Non-commercial harvesting was only responsible for six episodes (18%). Mussels were unquestionably the species most associated with poisoning episodes (55% of cases), followed by whelks (15%) and clams (15%).

The study also showed that the Lower St. Lawrence region had the highest number of “confirmed” and “potential” cases, with a total of 15 episodes (45%). It should also be noted that, in 10 of the 18 episodes classified as “confirmed” or “potential” and in which MAPAQ intervened, the shellfish came from growing areas in New Brunswick (five episodes), Prince Edward Island (four episodes) and Quebec (one episode).

### A significant impact

The study does not point to a conclusive increase in the number of poisoning episodes linked to marine toxins. However, it sheds light on the problem, perhaps hitherto underestimated, of the microbiological contamination of shellfish.

“Among the main impacts of the program, it should be noted that a greater number of participants, particularly clinical staff, have become more aware of the problem of toxic shellfish. When a case presents itself, they are therefore in a better position to suspect a shellfish-related illness and initiate effective treatment. We believe that the health care system now has the structure required to act as a ‘sentinel’ and limit the number of cases when a poisoning episode occurs,” concluded Duchesne.



#### **Blue Mussel**

Photo: P. Dionne, Fisheries and Oceans  
Canada



#### **Common Whelks**

Photo: P. Dionne, Fisheries and Oceans  
Canada



#### **Softshell Clam**

Photo: Y. Lamontagne, Environment  
Canada

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# Over the last five years, the St. Lawrence Vision 2000 Action Plan has helped to improve the health of the St. Lawrence

Since 1988, three agreements signed by the federal and Quebec governments to protect, conserve and enhance the St. Lawrence have allowed government partners to take action in various areas affecting the river. Since the third agreement (1998-2003) ends in March 2003, the editors of *Le Fleuve* would like to take this opportunity to publicize some of the results achieved in each component of Phase III of the St. Lawrence Vision 2000 Action Plan (SLV 2000).

## Five years of successful efforts in Biodiversity

*This is another instalment in the series of articles on the concrete results achieved since 1998 under Phase III of SLV 2000, as well as prospects for the future. In this issue, the focus is on the Biodiversity component. This month, Le Fleuve met with the co-chairs of the Biodiversity Advisory Committee: Isabelle Ringuet of Environment Canada's Canadian Wildlife Service and René Lesage of the Direction de la faune et des habitats, Société de la faune et des parcs du Québec [Wildlife and Habitats Directorate, Quebec Wildlife and Parks Corporation].*

*In 1998, the SLV 2000 Action Plan partners agreed to work toward meeting two major challenges in the area of biodiversity: to continue, and intensify, the species protection and habitat conservation efforts undertaken in previous phases and to develop thinking in a new area of action, water level regulation.*

### Results that have exceeded expectations

Five years later, the same enthusiasm reigns, but is now tinged with pride since, in some areas, results have exceeded expectations.

Isabelle Ringuet explained that "the Biodiversity component involves 138 projects. Some have been implemented and have led to significant achievements; I am thinking mainly of the Vianney Legendre fish pass, finished in the spring of 2001, at the St. Ours Dam on the Richelieu River. This structure is crucial to the survival of the copper redhorse, a threatened species found only in Quebec."

Along with the copper redhorse, the fish pass allows four other species at risk to once again swim freely up the Richelieu River: the lake sturgeon, American eel, American shad and river redhorse. The \$1.8-million project was undertaken

by nine partners, including Parks Canada, which acted as the principal contractor.

### Protecting species at risk: "We exceeded our objectives"

René Lesage reminisced that "In 1998, our objective was to help protect 35 species of wildlife and plants at risk. Today, five years later, this objective has been met and even surpassed, since we have improved our knowledge of close to 50 species and taken action to protect them."

If the St. Lawrence beluga was headlined in Phases I and II, the Atlantic sturgeon has been the star of Phase III. "One of the great successes of the St. Lawrence Vision 2000 Action Plan is the Atlantic sturgeon, which, by the 1970s, had almost completely disappeared from the St. Lawrence," explained Lesage.

After several years of research, biologists at the Quebec wildlife and parks corporation confirmed the presence of spawners in the river. This work also allowed them to identify three spawning areas and three foraging areas crucial to the sturgeon and to gain a better understanding of the species' movements between freshwater and saltwater areas.

The beluga has not been neglected in Phase III, however. According to Ringuet, the Beluga Recovery Plan resulted in extensive public consultations and the establishment of a working committee to observe and monitor the status of this endangered mammal. "The regulations formulated in the plan are now being implemented in the Saguenay—St. Lawrence Marine Park," she explained.

Ringuet also emphasized the importance of the knowledge acquired on Barrow's goldeneye. "The most





Dedication of the Vianney-Legendre Fish ladder, August 2002.  
Photo: C. Lachapelle, Environnement Canada

important discovery was finding the breeding grounds of this duck, which is a year-round resident of Quebec. The research also allowed us to determine the species' migration routes and confirm the importance of its wintering grounds near Baie Comeau."

Recovery plans have also been formulated for the copper redhorse, peregrine falcon, American shad, bald eagle, western chorus frog, green dragon and erect arrowleaf. Lesage emphasizes the importance of SLV 2000 Action Plan funding programs, which provide a springboard for research on, and protection of, wildlife and plant species at risk. "The knowledge acquired on sensitive species and the recovery plans formulated provide an

incentive for the various organizations concerned to become involved," he explained. Both chairs would like to see the recovery plans disseminated to a wider audience.

### **Controlling invasive species: status quo and successes**

"In terms of the control of invasive exotic species, the Chinese water chestnut, purple loosestrife and tench, discovered in the late 1990s, are being closely monitored," said Lesage.

"Unfortunately, a miracle solution has not yet been found for our number-one enemy, the zebra mussel, despite our many efforts," added Ringuet.

Greater success has been achieved with the greater snow goose, mainly due to the establishment of a spring hunt in the spring of 2000. According to Ringuet, "this measure has been effective, since it has reduced the population, which was around a million birds at its peak, and stabilized growth. In the spring of 2002, the greater snow goose population was around 600,000-700,000 individuals."

### **Protecting natural habitat: an ambitious objective**

Although the 1998 objective, to protect 120,000 ha of natural habitat, was quite ambitious, Lesage thought it would probably be achieved. "This is an area that we have paid very close attention to. We did manage to accomplish our mission in terms of the consolidation of two ecological reserves (Mont St. Pierre and Grands Ormes), and the creation of a new ecological reserve (Grande Rivière) and three Quebec provincial parks (Anticosti, Hautes Gorges de la Rivière Malbaie and Plaisance)."

"In terms of the seven wildlife sanctuaries, the planning and steps involved in establishing a sanctuary are well under way in the case of four of them (St. Fulgence, Rapides de Lachine, Rivière des Outaouais and Pointe du Lac). The establishment of the Rivière des Mille-Îles sanctuary and the Pierre Étienne Fortin sanctuary (Chambly) has been completed. The only sour note is the St. Barthélemy and Rivière des Outaouais sanctuaries, which are behind schedule."

The many priority, threatened or vulnerable species that will be protected by the establishment of these sites include the horned grebe, Anticosti aster and Fernald's milkvetch.



Greater snow goose  
Photo: Environment Canada

Ringuet added that there is also a plan to create a marine protected area around the Manicouagan peninsula.

“One of our most important achievements, although it may not be very flashy, is the establishment of a data bank on habitats protected under the SLV 2000 Action Plan and species at risk,” she said.

Lesage stressed that “the data bank is essential in answering the following question: do protected areas contribute to saving other species at risk?”

Ringuet gave the example of the Nicolet sanctuary, which was originally established to protect waterfowl. “It also contains six plant species likely to be designated as threatened or vulnerable.”

According to Lesage, since the wildlife and plants found in these areas are not well known, Phase IV will probably include studies and research in this area.

### **Management and conservation plans for sensitive habitats**

The establishment of management and conservation plans for sensitive habitats have been important objectives in Phase III. “The master plan for the Fouquette River, for which enhancement efforts began this year, was submitted last year. Three master plans have been submitted for the Assomption River and three stewardship projects are in progress. The master plan for the St. Maurice River is being drafted but the plan for the Ottawa River is late,” explained Lesage.

Ringuet added, “the review of the zoning plan for the Saguenay—St. Lawrence Marine Park has allowed the establishment of new regulations to ensure better management of marine mammal observation activities.”

Public access and education: putting people in touch with the St. Lawrence  
A number of sites and structures have been built to facilitate public access

to the St. Lawrence. The best known is undoubtedly the revitalization of the Lachine Canal, which was reopened to pleasure boating in the spring of 2002.

“A number of small projects to ensure access were also completed, often in co-operation with municipal partners,” according to Lesage. They include the shoreline of Lake St. Louis in Châteauguay, Summerlea Park in Lachine, the Léon Provancher marsh in Neuville and access to the river at Baie du Febvre, as well as the enhancement of riparian marshes at St. Anne de Sorel and of Frayère Park on the Rivière aux Pins, in Boucherville. Work on restoring port structures like the Baie St. Paul wharf has also opened up access to the St. Lawrence.

Ringuet noted that “the St. Lawrence Vision 2000 Action Plan has allowed us to provide various groups (nongovernmental organizations) and partners that have developed public awareness and education activities with funding. These activities have been incorporated into the interpretive programs for Canadian national parks, Quebec provincial parks and national wildlife areas.”

Every year, hundreds of thousands of visitors learn about the ecological value of the St. Lawrence through such efforts.

### **Water level regulation: the importance of environmental criteria**

In response to public concerns and the commitment by the International Joint Commission (IJC) to review criteria for water level regulation, the Biodiversity Advisory Committee took on a new challenge: designing a model to forecast the impact of water

level fluctuations on St. Lawrence ecosystems. This model will allow decision-makers to choose optimum water level regulation methods that take into account administrative and economic constraints.

Ringuet explained that “this project began the second year of Phase III. First, we set out to acquire an understanding of the river’s ecosystems and then worked on the hydrodynamic modeling of potential habitats for various species (plants, fish, and waterfowl and other birds). The results will allow us to link situations with a number of species, whether or not at risk.”

The work was done by the Water Levels subcommittee of the Biodiversity component and the IJC’s International Lake Ontario-St. Lawrence River Study Board. The IJC also provided Environment Canada (St. Lawrence Centre, Meteorological Service of Canada and Canadian Wildlife Service) and the Quebec wildlife and parks corporation with funding.

According to Ringuet, “the results showed that low water levels have an impact on many habitats and species. Researchers told the Navigation Advisory Committee about erosion problems along the banks of the St. Lawrence. The committee took into account the results of this research, which was carried out under the Biodiversity component, and has taken steps to reduce ship speed in sensitive areas of the St. Lawrence. This is an example of effective co-operation at work.”

### **A solid basis for Phase IV**

The two co-chairs agree that the environmental benefits to the health of the St. Lawrence exceed the results calculated in the SLV 2000

management tracking system. In addition, these successes will provide a solid basis for action in the next phase of the plan.

In Phase IV, the emphasis will be on ensuring the recovery of the Atlantic sturgeon and taking action to protect the species, which is our largest freshwater fish. The Atlantic sturgeon is likely to be designated as threatened or vulnerable given the small numbers of individuals found and low reproduction rates observed.

There will also be emphasis on reintroducing the striped bass. This native species, one of the indicators of the river’s health, severely declined over the last few decades, to the point where it disappeared from the river altogether. However, the bass is once again present in the St. Lawrence, due to the release of a number of individuals in late September of 2002.

“The St. Lawrence Vision 2000 Action Plan has had a significant leverage effect, promoting synergy, the convergence of actions and a strong commitment to restoring public access to the St. Lawrence,” concluded Lesage.

Ringuet added, “thanks to the plan, the general public has become aware of the St. Lawrence’s importance. Given the means employed, the results are very impressive.”

For more information on the topics discussed in this article, see Biodiversity on this Website.

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# News *in* BRIEF

## Just published

### Pamphlet on mechanical weed control for cereals and corn

The pamphlet, entitled "*Le mécanique dans les céréales et le maïs – Pour une stratégie de désherbage gagnante!*" [mechanical weed control for cereal and corn crops – a winning strategy], is aimed at informing Quebec farmers about the results of five technology transfer projects on mechanical weed control for cereal crops and corn. These projects were funded under the SLV 2000 Action Plan, as part of the Pest Management Strategy (Stratégie phytosanitaire), between 1998 and 2001.

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### First St. Lawrence Rendezvous to be held

On January 30, 2003, the Ecosystem Monitoring Committee of the SLV 2000 Action Plan will launch the State of the St. Lawrence Monitoring Program at a forum entitled St. Lawrence Rendezvous. The purpose of the event is to present the initial findings of the monitoring program and encourage discussion on these results, as well as on prospects for the future. A series of fact sheets on environmental indicators and a summary document will be distributed. The meeting will be held at the Marie Guyart Building in Quebec City.

The program, an initiative of the departments and agencies of the Quebec and federal governments involved in environmental monitoring of the St. Lawrence, is aimed at monitoring changes in the state of the St. Lawrence using environmental indicators for the main components of the ecosystem.

Roughly 200 SLV 2000 partners and guests working in various areas are expected to attend the first forum, representing municipalities, industry, universities, community groups and conservation organizations.

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