MARKETING PRODUCTS AND SERVICES OF SCIENCE BRANCH, MARITIMES REGION OF FISHERIES AND OCEANS CANADA

Identification of Opportunities and Barriers

July, 1998

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EXECUTIVE SUMMARY

The research laboratories of Canadian government departments and agencies are under increasing pressure to demonstrate that they are contributing to the national infrastructure of Canada through wealth and job creation. This is to be accomplished by, among other actions, improved transfer of government developed technology and scientific knowledge to, and increased interaction and collaboration with Canadian industry. For this reason, the government has made technology transfer a priority of every science-based department and agency.

This study identified science products and services presently being offered by Science Branch in the Maritimes Region, and those that might be offered in the future. Also identified were actions and changes that must be made to administrative and financial procedures if Science Branch is to successfully work with the private sector or foreign clients and recover costs or generate revenues that could be applied to the improvement of the laboratories.

Interviews were held with Science Branch personnel in the Maritimes and Ottawa, and with industrial and association representatives, and officials in other government organizations. At each of the three main Maritimes laboratories, focus groups were held to obtain input from the bench level scientists. An extensive review of the literature on government-to-industry technology transfer was conducted to identify both positive and negative factors that influence the success or otherwise of technology transfer.

The main factor identified in the literature that facilitates successful technology transfer is the willingness and ability of the originator of the technology or expertise to work with the adopter. Many of the authors warned that using revenue generation through licensing of government intellectual property as the sole or main measure of a laboratory's contribution to strengthening the private sector was misleading and would underestimate the laboratory's worth to industry.

The review of information from web-sites of similar foreign government laboratories in Australia, Britain, and New Zealand showed a much stronger emphasis on strengthening their marine industries than was found in DFO literature or its web-site.

Science Branch in the Maritimes has had several successes in transferring or commercializing its technology. Most recently, one of their scientists received an award from the Federal Partners in Technology Transfer for the transfer of plankton counter technology to a local firm. The success

of these transfers has been attributed in large part to the efforts of the individual government scientist in transferring the technology. On the fisheries side, the collaborative work in the Snow Crab fishery, whereby the Snow Crab Associations provide financial and in-kind support for the work at Science Branch, is a major success.

This study identified a number of product or services that may have commercial potential. These include:

- access to data and value-added data products;
- software and software products/models that could, for example, determine the best locations for aquaculture facilities;
- consulting services in areas such as fish nutrition, environmental impact studies and tagging programs;
- aquaculture management techniques;
- use of aquaculture facilities for training;
- standard reference diets for various species; and
- oceanographic and biological monitoring instrumentation.

Several barriers that impede the transfer or commercialization of technology or expertise from Science Branch to industry were noted. These include:

the culture within Science Branch is not fully supportive of marketing and commercialization;

the lack of any written policies or procedures to guide DFO personnel in working with or for the private sector or other external clients;

DFO's inability to respend monies earned from external sources and their lack of use of new financial tools to facilitate collaborative R&D;

- slow decision-making which drives away potential clients or collaborators;
- loss of expertise through a rapidly retiring workforce;
- out-of-date equipment that prevents the researchers from taking on projects needed by clients;
- perceived conflicts of interest due to the regulatory role of DFO that prevent taking on certain projects;
- impact of science personnel reductions resulting in gaps in expertise; and
- lack of support staff which forces scientists to waste too much time on clerical duties instead of conducting research of value to clients.

Industry and association interviewees generally spoke highly of the individual scientists in Science Branch and found them to be very helpful. Many voiced concern over DFO's inability to work more effectively with them in terms of timeliness of decision making and the loss of expertise through retirements.

Representatives of the aquaculture industry felt that DFO was not doing enough research in aquaculture, and what was being done emphasized salmon to the detriment of other species. It was clear that many aquaculturalists are turning to the Institute for Marine Biology (NRC) and Dalhousie University/TUNS as their primary source of information in some areas of aquaculture.

Other science-based government departments have been more successful in acquiring new financial tools and flexibilities that enable them to work more effectively with clients. In addition to having respending authority, some have the ability to receive fee-for-service revenue in the year it was earned; most reward not only the "inventor" of a licensed intellectual property but also the innovation team; most pursue international projects; most return funds, over and above those awarded to the inventor, to the originating laboratory; one has set up a matching fund for collaborative research and another has a revolving fund.

The following recommendations are designed to overcome the administrative impediments and improve the marketing of Science Branch products and services.

Administrative Changes DFO and Science Branch Must Make To Support A Marketing And Commercialization Program

Recommendation #1: The A-Base research and development budget of the Department be increased so that it covers the costs of research, surveys and monitoring necessary to support the regulatory role of the Department.

Recommendation #2: Establish procedures and fee structures to enable the Branch to charge for access to data that was originally collected in support of the DFO mandate but that is also of value to outside agencies or consultants.

Recommendation #3: DFO should try again to negotiate an agreement with Treasury Board for the retention and respending of externally earned revenues in order to provide the research laboratories with the financial tools they require to do business with the private sector, and to accept "grants" or monies from foreign institutions.

Recommendation #4: DFO develop policies on doing business with the private sector that identify the types of business activities that can be undertaken on a commercial basis. Policies must be developed in consultation with senior management in Science Branches in the regions.

Recommendation #5: After policies have been developed, regional managers in Science Branch should develop procedures and detailed guidelines for their scientific personnel on how to do business with the private sector.

Recommendation #6: After policies, procedures and guidelines have been developed, workshops should be presented for scientists and administrative staff, on what DFO policies and procedures are on doing business with the private sector and international clients. In addition, each scientist should be given a **printed** copy of the procedures and guidelines for easy reference. Information on the Intranet is not sufficient.

Recommendation #7: The Partnership Coordinator and the Financial Officer (and if available, the Business Development Officer) should conduct workshops on joint project and other types of R&D agreements.

Recommendation #8: Establish national and international fees at fair market rates, using Treasury Board guidelines for Costing of Government Services, for products and services of Science Branch.

Recommendation #9: DFO remove any administrative impediments to marketing its science products and services internationally and signal to its staff that appropriate international projects can be supportive of its mandate.

Recommendation #10: DFO follow the intent of the 1993 TB Policy and share the 35% award with the innovation team, and that any remaining revenues be returned to the originating laboratory to be used at the discretion of the Director, for improving the equipment, products and services of the laboratories.

Recommendation #11: Ensure that recognition for technology transfer activities is a genuine part of the performance appraisal process and be included on an equal basis with papers published when scientists are being considered for salary increases or promotion.

Recommendation #12: Provide mechanisms that enable and encourage scientific staff who were involved in the initial development of a technology or expertise to transfer to the adopting organization, on a temporary basis, to ensure the success of the transfer.

Recommendation #13: Identify areas where new scientific personnel are essential to provide scientific advice and know-how to existing and future, internal and external clients, and immediately embark on a program to hire new indeterminate staff. Institute a long-term program to ensure that new scientific staff are hired on an on-going basis to maintain the corporate memory and to bring "fresh blood" to the Branch. Ensure all new hirees know that marketing and commercialization activities will be part of their duties.

Recommendation #14: DFO and Maritimes Region embark on a program to replace old and obsolete equipment and facilities to enable the scientists and support staff to work more efficiently and effectively and to enable Science Branch to offer laboratory services to clients and to attract new staff.

Recommendation #15: Provide the research laboratories with clerical and administrative support personnel to handle the administrative duties.

Actions Needed to Improve Marketing of Science Branch Products and Services

Recommendation #16: Science Branch, Maritimes Region establish a Business Development Office, hire a Business Development Officer from the private sector to run it, and provide the office with adequate financial resources.

Recommendation #17: Establish Strategic Business Units within Science Branch based on the most appropriate structure to service clients.

Recommendation #18: Explore the possibility of SBUs within DFO "charging" other DFO SBUs for products and services and implement already existing mechanisms to recover costs of providing services to other government departments.

Recommendation #19: Science Branch develop a five year Business Plan that is updated annually.

Recommendation #20: Science Branch establish rates for access to data and for value-added data products for both internal DFO, other government (both Canadian and foreign) and non-government clients.

Recommendation #21: Determine the most appropriate medium for distribution of each type of data or data product. Make use of the Internet, where appropriate, as means of access to some data and data products and determine the most appropriate on-line method of collecting fees. Determine the most appropriate method of collecting money for other data products (charge accounts, deposit accounts, etc.).

Recommendation #22: Science Branch establish rates for consulting services to Canadian and foreign clients.

Recommendation #23: Establish rates for each type of laboratory service that could be offered.

Recommendation #24: Identify facilities and equipment that could be used by the private sector and establish rates for their use. In addition, determine whether a technician would be required and/or available to operate the equipment and include the costs of the technicians in the rates.

Recommendation #25: Establish policies, guidelines and mechanisms to enable Science Branch personnel, with the approval of local management, to respond to consulting opportunities in a timely manner, and provide consulting services, in both the domestic and international markets, on a cost recovery or profit basis without getting entangled in internal bureaucratic red tape.

Recommendation #26: Provide training in technology transfer for bench-level scientists and their immediate managers to enable them to work more effectively with the Business Development Office, their senior managers and with the DFO intellectual property manager.

Recommendation #27: Produce attention-getting brochures designed to inform industry of Science Branch's interest in working with or for industry.

Recommendation #28: Re-design the Science Branch web-site and develop individual laboratory web-sites to make them business-oriented. Web-sites should be maintained locally.

Recommendation #29: Develop, and provide Science Branch scientific staff with "Business Opportunity Lead" forms and establish an appropriate award system for leads that result in new business

Recommendation #30: Organize targetted industry specific open houses

Recommendation #31: Compile a data base of potential Science Branch client organizations

Recommendation #32: The Business Development Office, in conjunction with the Communication Office, develop a marketing/communications plan to promote the public good aspect of Science Branch work.

This study has identified a number of science products and services that could bring revenues to Science Branch if the Department develops and implements policies and procedures that will facilitate doing business with the private sector or with foreign clients, and provides the Science Branch with appropriate financial mechanisms that will enable it to use any revenues generated to support and improve the facilities of the laboratories. The status quo is not an option.

However, Science Branch should not look to Canadian private sector sources as an immediate source of significant new funds for the laboratories. Because of the present weakness of the fishing industry, the fledgling nature of the aquaculture industry, and the small size of the ocean instruments business, the "payoff" for the government's investment in the research and technology transfer of the Science Branch should be measured in terms of long-term economic benefits to Canada such as the return of a limited fishing industry to coastal communities and the creation of a strong, globally competitive aquaculture industry. International clients are most likely the most immediate source of new funds for the Branch.

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