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EVALUATION OF THE CANADA-UNITED STATES SPRUCE

BUDWORMS PROGRAM—ORGANIZATIONAL AND ADMINISTRATIVE

EFFECTIVENESS

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A joint Canada-U.S. program (CANUSA) was initiated in 1977 to address the spruce budworm problem. An evaluation of the administrative and organizational aspects of the program in 1983 recommended several changes in funding, communications, research planning, and research implementation. The evaluation utilized extensive interviews of researchers, administrators, and users.

The spruce budworm and its close relative, the western spruce budworm, have long been recognized as among the most harmful forest pests in North America. Recent outbreaks in both the eastern and western parts of the continent have infested significant portions of the spruce-fir forests. The problem has persisted for many years despite repeated, extensive aerial spraying programs.

An international program of cooperation in spruce budworm research was initiated in 1977 by the Department of Environment of Canada and the United States Department of Agriculture (USDA). CANUSA is the acronym for the joint Canada-United States Spruce Budworms Program.

A Memorandum of Understanding between these two lead agencies recognized that the pests were socially and economically important to both countries, that the extent of the damage to forests was unacceptable, that a wider base of knowledge was necessary to deal with the problem, and that coordination and cooperation in research and development between both countries would be more effective. The primary objective of the program was to "design and evaluate management strategies for control of the spruce budworms and/or management of budworm-susceptible forests which will assist forest managers to attain management objectives in an economically and environmentally acceptable manner." The Agreement encouraged joint publications of results, exchange of scientists, exchange of methodology and data, and exchanges of biological materials.

Organizational Features

CANUSA's management structure featured joint U.S. and Canadian leadership at several levels. In the U.S., it was headed by the Chief of the USDA Forest Service and in Canada by the Assistant Deputy Minister, Forestry, Environment Canada. A policy committee, The Joint Policy and Program Council (JPPC), provided direct policy guidelines to the two agency heads. The JPPC consisted of four members from each country and had the general purpose of assuring maximum cooperation and coordination. For the operational planning aspects of the program, a Joint Planning Unit (JPU), also with four members from each country, answered to the JPPC. The primary purpose of the JPU was to evaluate budgets, allocate funds to program areas, and review overall progress. The Agreement also provided for a 20-person Advisory Committee that was to serve as a "focal point whereby the concerns of resource managers and other interested groups can be brought to the attention of the Joint Policy and Program Council." The Advisory Committee was never formed. A Canada Program Leader and a U.S. Program Leader were to have day-to-day administrative and technical responsibility for all budworms research in the respective countries.

The Memorandum of Understanding provided for establishment of all the organizational features down through the Program Leaders. Organization below that level was to fit the needs of the individual countries. In the U.S. there were eastern and western program managers at the USDA Forest Service's Northeastern and Pacific Northwest Experiment Stations. In Canada, the program was administered largely by the heads of the six Forestry Research Centres and two Forestry Institutes of the Canadian Forestry Service.

Organization of the program drew on recent previous experience with accelerated forest insect research and applications programs conducted by the USDA. These programs had responded to needs for more effective technology in dealing with the gypsy moth, Douglas-fir tussock moth, and the southern pine beetle (Ketchum and Shea 1977). While several State and federal agencies were involved cooperatively in the earlier programs, CANUSA was the first formal joint international forestry-related program.

Purposes of Evaluation

In late 1982, about 18 months before the program was to end, the JPU and JPPC recommended to the lead agency administrators that a critique of the program be undertaken. The thrust of the critique was to evaluate the effectiveness of the CANUSA organization and administration in accomplishing the objectives of the Memorandum of Understanding. Because many research results would not be implemented for some time after the program's completion, and because many of these results would probably undergo more refinements in the development and applications stages, evaluation of their effectiveness was not to be included in this review.

Future joint programs were also to benefit from the evaluation. The U.S. and Canada have other forestry-related areas that could possibly be the focus of formal research cooperation, e.g. mountain pine beetle control, forest fire research, and silvicultural studies. But before another joint venture was undertaken, the federal agency administrators wanted to know how well the CANUSA organization worked and how it might be improved, if possible.

Evaluation Procedures

Two Canadians and two Americans were appointed to the review team. None of the four had been involved directly in research or administration of CANUSA. The CANUSA Review Team members were Jack Coater, West Virginia University, Kenneth Knauer, USDA Forest Service, Washington, DC, Denis Lachance, Canadian Forestry Service, Quebec City, Quebec, and Kenneth Runyon, Canadian Forestry Service, Fredericton, New Brunswick. Two of the team were forest entomologists, one was a forest pathologist, and the fourth was a forest economist.

The team first met in Washington in November 1982 to begin development of a study plan to be submitted for review and approval to the JPU. Several constraints affected the plan. First was time—the evaluation was to be completed and the final report submitted within three months of approval of the study plan. Second was financial support. Limited funds were available. The team member's institutions gave the needed staff support and only limited funds were available for other costs. And the last important constraint was that the administrators did not want the study to disrupt, unduly, the on-going program and projects. To accomplish the objectives within the temporal and fiscal restraints, therefore, the evaluation used interviews of key administrators, researchers, and users. It was clear that the schedule and budget for the evaluation would not permit using a statistically designed survey. Perceptions obtained from interviews were the basis for an overall assessment of the accelerated approach to forest pest research programs (Allen et al. 1982).

To maximize the information collected within the time available, the interviews were conducted by two-man teams of one Canadian and one American each. Some interviews were conducted individually, others in small groups. The interviews focused on the planning, budgeting, implementation, monitoring, and information exchange functions of the program. The focus on these five management functions was intended to provide a more-or-less consistent framework for interviews. Topics covered in each of the management areas included:

Planning

Goal, objective, and priority setting processes; administrative and technical support provisions; activity and task scheduling; technology transfer plan development; authority

and accountability constraints; decision making processes; international and regional cooperation mechanisms; national policy constraints; and roles of the JPU and the JPPC.

Budgeting

National policy differences and effects; development process and constraints; control and criteria for allocation process; visibility of the process; funding adequacy and stability; CANUSA-imposed administrative obstacles; and the role of the JPU and the JPPC.

Implementation

Advisory group formulation and function; working group formulation and function; project management process; adherence to program plans and priorities; role of the JPU and the JPPC, national policy differences and effects; program staffing adequacy.

Monitoring

Role of the JPU and the JPPC in oversight; feedback mechanisms to the JPU and the JPPC; project oversight process; national policy differences and effects; visibility of the monitoring process; fiscal review process; reaction to contractor non-performance; role compatibility between organizational levels within CANUSA; program staffing adequacy.

Information Exchange

Program policy and plan documentation; program status reporting; process for external response to program materials; provision for post-program international cooperation; stimulation of international exchange of information; program staffing adequacy.

The interviewers thoroughly discussed the management functions before the interviews to increase common understanding and a standard list of questions was used by both teams. Individuals were also given the opportunity to provide general reactions to CANUSA organization and administration.

Interviews were conducted at Canadian Forestry Service Headquarters in Ottawa and Provincial Forestry Headquarters in Quebec City, Quebec and Fredericton, New Brunswick. Canadian investigators, forest managers, and pest managers were interviewed during site visits to Canadian Forestry Research Centres at St. John's, Newfoundland, Fredericton, New Brunswick, St. Foy, Quebec, Sault St. Marie, Ontario, and Victoria, British Columbia. U.S. Forest Service and university researchers, and state agency and industry cooperators were interviewed on the Michigan State University and University of Maine campuses. Additional U.S. Forest Service investigators and pest managers were interviewed at the Northeastern Forest Experiment Station in

Brooksville, PA and at the Pacific Northwest Forest and Range Experiment Station in Portland, OR. A series of interviews of researchers, investigators, pest managers, and cooperators was conducted at the Western Forest Insect Work Conference in Santa Rosa, CA. USDA Cooperative State Research Service and U.S. Forest Service members of the JPU and the JPPC were interviewed in Washington, DC. Key people with whom the team was unable to meet with otherwise were interviewed by telephone.

When all interviews were completed, the evaluation team reconvened to summarize findings of the interviews, to identify common perceptions and findings, and to weigh issues that had been raised. In all, 138 individuals were interviewed as summarized in the following table:

Summary of Persons Interviewed
by the CANUSA Review Team

Category	Canada	U.S.	Total	Percent
Administrators	8	10	18	13
Research Managers	12	13	25	18
Investigators	32	22	54	39
Users	10	31	41	30
Total	62	76	138	100

Findings of the Evaluation

While the evaluation was not to address program accomplishments, certain non-technical achievements and contributions became apparent during the critique. Foremost among these accomplishments were improved communications and personal rapport between the executive administrators of the two federal forestry agencies. This extended to the scientist and manager levels. CANUSA paved the way for cooperation on other forestry-related matters.

Specific institutional goals were accomplished by both countries. In Canada when CANUSA was being proposed, the Canadian Forestry Centres were experiencing cutbacks in staffs and budgets. The extensive spruce budworm outbreaks in the eastern provinces triggered criticism that the federal government was not doing enough to solve the problem. The joint international program reaffirmed the importance of the Canadian Forestry Service and provided a visible federal response to the budworm problem.

Events transpiring in the U.S. were similar to Canada. A major motivator for the Americans was the opportunity to reprogram funds from the on-going accelerated research and development programs that were nearing completion. Loss of the funds to the forestry research budget faced the U.S. Forest Service. CANUSA also provided a U.S. response to growing demands for more attention to the spruce budworm problem. Since the Canadians had considerable information and

experience with the problem, an accelerated program in the U.S. that involved Canadians would have credibility with knowledgeable support groups.

CANUSA provided the Canadians impetus for an extensive review of their research. This review, known as the Spruce Budworm Task Force Review, and the follow-up Spruce Budworm Implementation Plan, became a national plan for Canadian spruce budworm research.

Organizational

Three organization-related elements were found to be the subject of strong opinions by many interviewees; these were the roles of the JPU and the JPPC, the roles of the Program Leaders, and the effectiveness of the Working Groups.

Formation of the JPU and the JPPC were motivated by real management concerns. The JPPC was to provide policy-level support and feedback to the program. The JPU, on the other hand, was created to provide technical oversight to the research elements and priorities. There was concern from administrators interviewed that the two policy and review bodies generally were not adequately informed on program matters to be as effective as planned. Pest managers and forest managers also doubted that the JPPC was close enough to user needs and the budworm problem in general to be able to make the best decisions. An opinion of some of the interviewees was that JPPC and JPU existed mainly to satisfy political considerations and not to satisfy program considerations.

The Memorandum of Understanding established Program Leader positions in each country. The language of the Memorandum indicates that these positions were to have broad managerial authority. In practice, the Program Leaders were second-line staff positions within their respective organizations. Although they were expected to be cognizant of national objectives and priorities, and were charged by the Memorandum to "execute the Program", they relied, of necessity, on staff influence and not on direct authority. Other administrators in the program viewed the Program Leader's role as primarily one of information coordination. Both Leader's were, in fact, more active in coordinating international communications than in coordinating or facilitating their respective national programs. One result of this situation was the general lack of coordination, regionally, of the programs within a country. This gave the appearance of four programs; Canada-East, U.S.-East, Canada-West, U.S.-West.

The third organizational finding of concern related to the Working Groups. These groups consisted of forest managers, pest managers, and researchers organized around specific program subject matters such as silviculture, biological control, and economics. They were to meet at least once a year to discuss results of previous work and to coordinate studies for the next year. While the organization and function of these

groups appears to be conceptually straightforward, there was considerable dissatisfaction and confusion among users and scientists about their purpose. Some of the complaints about the groups were; that the meetings did not encourage coordination but, instead were often used by funded researchers to sell themselves and their work; that scheduling of the meetings made it difficult to participate in more than one subject; that meetings were too large for meaningful discussion; that the meetings preempted previously established coordination meetings that were of proven value.

Administration

The administration-related elements that were identified to be of concern stimulated conflicting and diverse opinions from the interviewees. Most comments related to the planning process. The planning process was criticized most often for failing to recognize differences between the two countries in administrative procedures and research needs.

Perhaps this perception arose at the beginning of budworm planning when the U.S. Forest Service developed its first plan in late 1974 and early 1975 (the "Denver Plan"). Later, in December, 1977, a modified Denver Plan was discussed in Portland, Oregon and again in Montreal. Canadians were part of both meetings. These plans were developed using the convergence analysis technique (Shea and Bayley 1976), a planning methodology used by the Americans for the three forest pest R&D programs. The technique provided a detailed framework for planning. The Canadians, on the other hand, did not have a detailed long-range budworm research plan at the program's outset.

The Canadian's long history of budworm research gave their researchers insight to specific problems and requirements in budworm research. The scope of those needs was much narrower than the all-inclusive scope in the Activity Schedule that resulted from the convergence analysis technique. Canadian researchers had no experience with the technique, and neither did many American researchers. The interviews indicated that a common opinion was that convergence analysis gave results that were unrealistically broad and naive.

Philosophical differences in the scope of such a program also affected CANUSA administration. It appeared to the review team that Canadians expected the program to concentrate on developing tools for users that could be developed and made available within its five-year time frame. U.S. investigators appeared to expect the program to accelerate the formulation of a spruce budworm management strategy that would incorporate a variety of new and existing tools.

The review team also concluded that differences between the U.S. and Canada in the level of funding for CANUSA affected the extent to which a true joint program was achieved. Canada was already involved in spruce budworm research

through its on-going program when the CANUSA agreement was signed. At that time, the U.S. had limited base funds in spruce budworm research. When accelerated funds became available in the U.S., the advantage of great flexibility in research direction and opportunity for bold initiatives were presented. Accelerated funding was not made available in Canada and new opportunities were difficult to develop. The fact that some U.S. money was available for research in Canada did not generally stimulate the Canadian research community to become deeply involved in CANUSA.

Recommendations

On the basis of its findings the CANUSA Review Team made several recommendations on organizational and administrative aspects of CANUSA.

1. Combine the JPU and JPPC functions into a single advisory committee called, for example, an Executive Policy Council. The Council would decide program goals, commit resources, and monitor progress. For technical advice, it would call on experts in its constituency agencies to form a technical committee. The technical committee could be ad hoc.

The JPU and JPPC, on reviewing this recommendation, did not agree with the review team. Two review and advisory groups were necessary, they concluded.

2. Program Leaders in each country should report directly to the most senior lead-agency line officer responsible for the country's commitment. The positions must carry authority commensurate with the level of accountability expected.

The JPU and JPPC agreed with this recommendation, saying that the skills of program managers should be equally balanced between managerial and technical abilities.

3. Working groups are an important feature of such technical programs. Form them before the program starts, use them to review and evaluate program directions and priorities in their respective subject matters, and facilitate the dissemination of information within them.

The JPU and JPPC agreed, indicating that the groups should be flexible and adaptable to changing program needs.

4. Planning should be a structured process and bilateral so that both principals feel they have ownership in the plans that are developed. Use the first year of the program for planning; delay the phase-in of project work until plans are complete and the organization and resources are in place.

The JPU and JPPC accepted the team's recommendation.

5. Require that each partner country make

available a special fund to finance the joint program. Supplementary funding, above base-level funding, is necessary to emphasize the departure from "business as usual."

The JPU and JPPC accepted the recommendation, providing that it applies specifically to accelerated programs.

6. In an accelerated program, as opposed to a longer-term or on-going program, focus on projects that are amenable to acceleration and application. Support basic research when necessary to fill knowledge gaps that threaten program success.

The JPU and JPPC agreed with the team, clarifying that the recommendation should not apply to on-going base programs.

7. Begin early to involve users and program beneficiaries in communications and implementation of results. Have an implementation plan as part of the initial research plan for the program and for individual projects.

The JPU and JPPC accepted the team's recommendation here, adding that any modifications of agency standards to emphasize user-oriented publications should not relax general standards of publication quality.

Discussion

One could suggest that the study approach admits elements of subjectivity to enter the evaluation process. Disciplinary and national biases of the team members could certainly influence both the conduct of the interviews and the interpretation of the results. We do not feel this occurred with the CANUSA Review Team. The team recognized the prospects for this and there was some feeling that a formal questionnaire, or survey, should be part of the study approach so that findings would come from a method of data collection besides interviews. Constraints did not permit including such surveys in the study, however.

Careful selection of the review team members would appear to be the best way to obviate the element of subjectivity. Personal characteristics are at least as important as disciplinary representation. Team members must be objective from their disciplinary, regional, and national viewpoints. For an evaluation of this sort, they also must be sensitive to features of organizations that influence the objectives of the program. The CANUSA team members did not have any special training in interview techniques, but some brief formal training would probably be useful.

The study approach accommodated the restraints under which the evaluation was done, i.e. short time availability, funding availability, and minimal impact on the on-going program. The approach provides a way to obtain a comprehensive view of the administrative and organizational machinery of a large program.

One of us (JEC) was involved in an administrative capacity with the Expanded Southern Pine Beetle Research and Applications Program (ESPBRAP), a large accelerated pest program in the U.S. that preceded CANUSA. The evaluation used for that program (Cleland *et al.* 1982) and the one reported here for CANUSA are not directly comparable; not in the cost of the evaluations, the time required for their completion, the approach used, the amount of data collected, nor in the objectives of the two evaluations. The ESPBRAP evaluation approach permitted the quantification of program accomplishments using a survey method to obtain clientele assessments of the program's effectiveness. The evaluation also included estimates of the benefit/cost effects of the program. One difficulty with the ESPBRAP evaluation, in fact a difficulty with the evaluations of all the U.S. Forest Pest R&D programs at that time, was that the evaluations were carried out before the efficacy of research results could be properly assessed. It would appear to us that most of the significant recommendations of the evaluations of those programs could have been obtained at less cost and in a more timely manner, with less disruption of the on-going program, using an approach similar to the one used for CANUSA.

As a result of its evaluation, the CANUSA Review Team suggested guidelines for the organization and administration of accelerated international programs. These are:

1. Identify the needs and objectives of each partner and focus the program on needs and objectives shared in common.
2. Recognize the knowledge and resource constraints under which each partner must function and structure the program to capitalize on each partner's strengths.
3. The resources available for the program should be clearly identified early in the planning process and should express each partner's commitment relative to the expected benefits to their forest resource.
4. Create a heightened sense of importance by changing "business as usual" to reinforce the special nature of the program and require participation at the executive policy level to emphasize agency commitment.
5. Establish a focal position or program leader in each country to service continuing international liaison needs and to serve as a program identity figure.
6. Provide the focal position with authority commensurate with the accountability expected of that position.
7. Keep staffs required to manage the program at a minimum and of the same relative size in both countries.
8. Employ existing agency organizational elements as much as possible to accomplish program

Some of the advantages and disadvantages of accelerated research and development programs have been discussed by Allen *et al.* (1982).

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