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PROGRAM EVALUATION CIVIL AIR SEARCH AND RESCUE ASSOCIATION

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SYNOPSIS

This report presents the results of an evaluation conducted by the Chief Review Services (CRS) to assess the role and effectiveness of the Civil Air Search and Rescue Association (CASARA) as it contributes to the Department of National Defence (DND) and the Canadian Forces (CF) fulfilling their federal search and rescue (SAR) mandate. CASARA is a federally-incorporated non-profit volunteer organization which is sponsored through a federal contribution agreement between DND and the Association. The federal contribution of \$2.38M (2004/05) provides the funds that ensure a significant search and rescue capability exists in a volunteer organization to support, augment, and offer a responsive, locally-based search capability to assist DND in its search and rescue operations and to assist Transport Canada by actively participating in aviation safety and promoting search and rescue prevention.

In accordance with the Treasury Board policy on Transfer Payment, renewal of the contribution agreement between the federal government and CASARA (1 April 2004) was made contingent on the completion of a review of the program effectiveness of CASARA. This evaluation determined that qualitative and quantitative indicators of the capabilities and contributions made by CASARA demonstrate both economic as well as operational effectiveness returns on the annual federal contribution to the Association. Mainly, the return on engaging CASARA to augment CF primary search and rescue resources is in the form of cost avoidance – CASARA provides fixed-wing aircraft and trained SAR volunteers acting as pilots, navigators, spotters and search and rescue coordinators.

Using only two “proxy measures” of the relative cost-effectiveness of CASARA – namely validation of Emergency Locator Transmitter (ELT) alarms and CASARA flying hours in support of Joint Rescue Coordination Centre (JRCC) taskings – demonstrates a potential cost avoidance for the CF of \$3.34M to \$9.63M (based on 2003/04 levels of activity and using CF operating costs or full costs respectively). In addition to direct cost avoidance, CASARA provides significant additional value through their volunteer hours, search and rescue administrative support, responsiveness, local knowledge, available infrastructure and community involvement.

The Review Team concludes that, in the absence of CASARA, the value of the federal contribution agreement (\$2.38M 2004/05) could not obtain a comparable level of search capability, geographic coverage, responsiveness or national search and rescue awareness that is achieved through the sponsorship of CASARA. Recommendations to ensure that the funding for CF operational support to CASARA is appropriate and that a comprehensive future vision of CASARA be developed, are made in this report to further strengthen the value and contributions being made by CASARA to the National Search and Rescue Program.



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RESULTS IN BRIEF

INTRODUCTION AND BACKGROUND TO THIS STUDY

The Civil Air Search and Rescue Association (CASARA) is a federally incorporated non-profit volunteer organization. It has been established to provide organized and trained volunteer assistance to the Department of National Defence (DND) in its search and rescue (SAR) operations and to actively participate in aviation safety and the promotion of SAR prevention.

The Department of National Defence and Transport Canada (TC) have provided funding to CASARA via a Contribution Agreement since its inception in 1986. The scope of services to be provided by CASARA is outlined in a Memorandum of Understanding (MOU) between DND and Transport Canada and CASARA. On 31 March 2004, the existing Contribution Agreement between DND and CASARA expired.

Severed under section 69(1) of the AIA – Confidences of the Queen's Privy Council for Canada.

FOCUS OF THIS EVALUATION

This report presents an assessment of CASARA’s contribution to the Department of National Defence in fulfilling its mandate and responsibilities for search and rescue on behalf of the National Search and Rescue Program (NSP). In addition, this evaluation discusses the role and contribution of CASARA in support of Transport Canada’s responsibilities for civil aviation safety. This evaluation also reviews the effectiveness and efficiency of the CASARA organization in achieving its objectives.

PRINCIPAL EVALUATION OBSERVATIONS AND CONCLUSIONS

The evaluation team found that the national volunteer SAR capability provided by CASARA is a logical and effective organizational response to meeting the objectives of the National Search and Rescue Program. This has been demonstrated primarily by the breadth of SAR capabilities provided by CASARA, its level of volunteer activity and responsiveness to DND taskings, and the extent of volunteer resources that are made available to augment and support DND and TC in their search and rescue responsibilities. Under its MOU with DND and TC, CASARA contributes to DND’s role of providing aeronautical search and rescue (SAR) services and TC’s role of providing an aeronautical SAR prevention program. CASARA provides: aircraft and crews, SAR spotters (that can be employed on CASARA and CF aircraft), ground homing of Emergency Locator Transmitter (ELT) alarms, assistance in the set-up and running of deployed search headquarters, local knowledge (of terrain, flying habits, other search organizations,



community leaders, media, language, and family members of missing persons), aviation safety training courses and safety conscious aviators throughout the aviation community. CASARA volunteers are trained to standards that are monitored by DND. CASARA units are evaluated and certified operational by DND.

In FY 2004/05, DND and Transport Canada will collectively provide CASARA \$2.386M under a contribution agreement, with DND contributing \$1.986M and TC \$0.400M. As SAR is a responsive activity, reimbursement for CASARA participation in actual SAR operations (which was \$255K for FY 2003/04) is separately funded from the National SAR budget. CASARA is clearly a cost effective program when one considers the SAR capability that CASARA makes available to DND (by way of aircraft and trained personnel), the cost avoidance savings to DND when they employ CASARA (by reducing the use and extending the economic life of DND's primary SAR assets), the increased responsiveness of the SAR program (due to distribution of CASARA units throughout Canada), the assistance CASARA provides in establishing deployed SAR headquarters, CASARA's local knowledge and the aviation safety courses that CASARA members both provide and attend.

Although the appropriateness of the existing funding option is being separately reviewed within DND, the evaluation team concluded that the current use of a Contribution Agreement to fund the SAR capability and services provided by CASARA remains the most appropriate funding arrangement.

CASARA provides SAR operational support to other SAR agencies (such as the RCMP, Parks Canada, municipalities and local police). These agencies reimburse CASARA for the specific costs of providing the support. This does not disadvantage DND. DND's operational taskings always receive CASARA's first priority. Furthermore, CASARA's participation in actual SAR operations for other agencies is encouraged as it motivates the CASARA volunteers who may lose interest and leave the organization if they do not use their training for real world events.

DND appoints CASARA liaison officers (CLOs) who assist CASARA units in the training of their members and perform operational evaluations of the units. Resource constraints have affected DND's ability to support CASARA training and evaluation. Several CASARA units in Quebec and Northern Canada have lost their operational status because CLOs have been unavailable to conduct operational evaluations within the requisite 24-month period. CASARA training sessions have also had to be cancelled due to the unavailability or unavailability of Canadian Forces (CF) Hercules aircraft. The evaluation team concluded that funding levels for DND operational support of CASARA should be carefully reviewed and managed to ensure that the benefits of establishing and maintaining CASARA under the contribution agreement are not lost.

TC has maintained an annual contribution level of \$400K since CASARA was established in 1986. TC has since divested the provision of air navigation services to NAV Canada, retaining only the regulatory role. TC has also delegated management of the CASARA relationship to the TC regions. The result is that the CASARA activities carried out in support of TC may vary from region to region. In addition to the evolving TC relationship, there are a number of other ongoing activities that may influence CASARA's



future: the National SAR Secretariat (NSS) has produced and distributed a comprehensive questionnaire to CASARA members to determine if there may be problems sustaining CASARA's volunteer membership; DND has commissioned an operational research analysis project to determine where CASARA units should be located to provide maximum benefit to the Canadian SAR system; and changes in SAR technology may influence CASARA's role in locating Emergency Locator Transmitters (ELTs). It may also be an appropriate time for consideration of CASARA's possible contributions to Arctic sovereignty. The evaluation team concluded that DND, TC and CASARA would benefit from the development of a collective and comprehensive vision of CASARA's future, which addresses all of these points.

The total federal government expenditures to CASARA, including fixed costs in the form of a contribution payment and incidental costs for operational taskings represents less than 1.6 per cent of DND's and Transport Canada's total expenditure on search and rescue. The Review Team concludes that, in the absence of CASARA, a comparable level of search capability, geographic coverage, responsiveness or national SAR awareness could not be achieved if this amount was to be expended on additional federal primary search and rescue assets.

RECOMMENDATIONS

The evaluation team recommends that:

1. The Department of National Defence and Transport Canada continue to sponsor CASARA through a Contribution Agreement to provide organized and trained volunteer SAR assistance.
2. The funding levels for 1 Cdn Air Div operational support of CASARA be carefully reviewed and managed to ensure that the benefits of establishing and maintaining CASARA under the contribution agreement are not lost by under funding 1 Cdn Air Div's operational support responsibilities.
3. DND, TC and CASARA develop a collective and comprehensive vision of CASARA's future.



MANAGEMENT ACTION PLAN

CRS Recommendations	OPI	Management Action
The Department of National Defence and Transport Canada continue to sponsor CASARA through a Contribution Agreement to provide organized and trained volunteer SAR assistance.	D Air FE	Agreed. In cooperation with Transport Canada, DND is prepared to continue to support and sponsor CASARA through a Contribution Agreement.
The funding levels for 1 Cdn Air Div operational support of CASARA be carefully reviewed and managed to ensure that the benefits of establishing and maintaining CASARA under the contribution agreement are not lost by under funding 1 Cdn Air Div’s operational support responsibilities.	A3 SAR	A review of the support to the operational funding for CASARA will be undertaken to ensure that the benefits of CASARA are not lost. This will be accomplished by end fiscal year 2005/06.
DND, TC and CASARA develop a collective and comprehensive vision of CASARA’s future.	D Air FE	A strategy for developing a vision for CASARA will be implemented. This will incorporate the information gathered using the RMAF structure. Work towards this has been initiated and is scheduled to be completed by mid 2005.



PART 1 – EVALUATION SCOPE, OBJECTIVES AND METHODOLOGY

EVALUATION SCOPE AND OBJECTIVES

The purpose of this program evaluation is to assess the role of the Civil Air Search and Rescue Association (CASARA) as it contributes to the Department of National Defence (DND) and the Canadian Forces (CF) in fulfilling their mandate and responsibilities on behalf of the National Search and Rescue Program (NSP). In addition, this evaluation discusses the role and contribution of CASARA in support of Transport Canada's (TC) role and responsibilities for civil aviation safety. The evaluation addresses, to the extent possible, the cost-effectiveness of the CASARA organization as a recipient of transfer payments received from the Department of National Defence. The purpose of the contribution funding is to establish a national volunteer SAR capability which is available to assist DND and TC in fulfilling their NSP mandates.

Specific evaluation issues addressed by this evaluation are:

- The rationale and mandate of CASARA and the linkages between CASARA objectives and DND/CF missions and taskings;
- The effectiveness of CASARA in achieving program goals; and
- The overall effectiveness and cost-efficiency of CASARA as a volunteer organization providing aeronautical search and rescue services throughout Canada.

The appropriateness of the federal transfer payment mechanism which is currently in place to fund CASARA,¹ is being reviewed by the responsible financial authorities within DND. This evaluation provides an assessment of the funding options available at Annex D to this report.

Although this evaluation was conducted on behalf of DND, it should be noted that DND and Transport Canada are both parties to the Memorandum of Understanding (MOU) with CASARA. Furthermore, only DND and CASARA are party to the Contribution Agreement whereby funds are transferred to CASARA. DND recovers a portion of the total funding from Transport Canada as defined in the MOU.

¹ CASARA is funded through a contribution agreement according to the Treasury Board Secretariat Policy on Transfer Payments, 1 June 2000.



METHODOLOGY

A mixed methods approach combining qualitative and quantitative information was used to gather supporting evidence for this evaluation. CASARA performance data was collated from databases supporting CASARA annual reporting from 1993 to the present. Costing calculations are based on information derived from the 2004/05 DND Cost Factors Manual combined with “conservative” assumptions made regarding aircraft use and number of flying hours for primary SAR activities.

The Results-based Management and Accountability Framework – Civil Air Search and Rescue Association (February 2004) prepared by the Directorate of Air Force Employment (D Air FE) was used as a guide to report on specific issues. Information gathered from available documentation, databases, and file reviews was augmented by interviews with program participants and key stakeholders.



PART 2 – CASARA PROGRAM OVERVIEW

THE NATIONAL SEARCH AND RESCUE PROGRAM – THE ROLE OF DND, TRANSPORT CANADA AND CASARA

National Search and Rescue Program (NSP): In 1986, the Government of Canada directed the establishment of a National Search and Rescue Program (NSP). The NSP is a cooperative effort by federal, provincial and municipal governments along with other search and rescue organizations. As stated in the National Search and Rescue Manual, the objective of the NSP is to save lives by enhancing search and rescue (SAR) prevention and provide effective and affordable SAR services in Canada’s SAR areas of responsibility.

In order to provide a single focus for search and rescue as a distinct and integrated activity within the federal system, the Minister of National Defence is identified as the Lead Minister for SAR (LMSAR). The LMSAR is the designated national spokesperson and is charged with ensuring that the national SAR system operates effectively. The LMSAR is supported by the Interdepartmental Committee on Search and Rescue (ICSAR) which is comprised of senior federal officials representing six federal departments and agencies who are responsible for SAR operational program delivery.² In providing search and rescue services to marine and air incidents, federal resources are assisted by volunteers, the private sector and other levels of government.

The National Search and Rescue Secretariat (NSS) is an independent body outside the line authorities of search and rescue delivery departments and plays a central management support role of the overall SAR objectives of departments. The role of the NSS is to enhance the provision of effective, efficient and economical SAR services in Canada by facilitating the development of the National SAR policy.

The Role of DND: The primary responsibility for the provision of aeronautical search and rescue services and effective operation of the coordinated aeronautical and marine SAR system is assigned to the Department of National Defence. The principal resources DND has to fulfill these responsibilities are designated SAR aircraft, Joint Rescue Coordination Centres (JRCCs), and a high level of secondary SAR support through all other CF aircraft. DND’s aeronautical SAR responsibilities cover more than 18 million square kilometers, including operations within Canada and those areas assigned by international agreement.³

“The National Search and Rescue (SAR) objective is to prevent loss of life and injury through search and rescue alerting, responding, and aiding activities using public and private resources. Through prevention measures focused on owners and operators most commonly involved in SAR incidents, the National Search and Rescue Program will attempt to reduce the number and severity of SAR incidents.”

*National Search and Rescue Manual,
B-GA-209-001/FP-001*

² Environment Canada, Department of Fisheries and Oceans (Canadian Coast Guard), Department of National Defence, Parks Canada, Solicitor General (RCMP) and Transport Canada.

³ By international agreement, Canada has responsibility for SAR operations over 1200 kms into the Pacific Ocean and over 800 kms into the Atlantic Ocean.



DND provides approximately 88 per cent of federal personnel resources allocated to the NSP⁴ and 59 per cent of the federal financial support.⁵ Primary DND SAR resources allocated to search and rescue are 15 search and rescue helicopters and 16 fixed-wing aircraft with dedicated aircrew and SAR technicians who are on immediate standby to respond to SAR distress situations. DND also maintains JRCCs in Victoria, Trenton, and Halifax which are manned 24/7 by CF and Canadian Coast Guard personnel.

The Role of Transport Canada: Transport Canada has the primary responsibility for the provision of the aeronautical search and rescue prevention program under the authority of the Aeronautics Act. This responsibility is carried out through education programs, regulation and enforcement, and is conducted in consultation with DND SAR authorities. Coordination of this role is effected through the Interdepartmental Committee on Search and Rescue (ICSAR).

Transport Canada provides approximately 1 per cent of the personnel resources allocated to the NSP and less than 0.5 per cent of the federal financial support, exclusive of its contribution to the NSS SAR New Initiatives Fund.

The Role of The Civil Air Search and Rescue Association (CASARA): The purpose of CASARA is to provide an organized and trained group of volunteers that can aid and assist the Department of National Defence in the conduct of its search and rescue operations and to assist Transport Canada in the promotion of aviation safety. CASARA provides SAR trained, safety-conscious crews and aircraft to augment federal search and rescue resources. The objective of CASARA is to prevent accidents, and for those accidents that cannot be prevented, to provide a rapid search response to distressed aviators through the use of locally based aircraft and crew.

CASARA PROGRAM PROFILE

The Civil Air Search and Rescue Association (CASARA) is a Canada-wide ‘non-profit’ volunteer organization established in 1986 to provide organized and trained volunteer assistance to the Department of National Defence in its search and rescue operations and to actively participate in aviation safety and the promotion of SAR prevention.

⁴ Seven hundred and eight-one (781) full-time equivalent positions were provided in 2003/04. Department of National Defence: 2004-05 Report on Plans and Priorities.

⁵ \$161,589,000 in 2003/04. Ibid.



DND and Transport Canada are the federal sponsors of CASARA under the auspices of a federal government Contribution Agreement. The current Contribution Agreement (2004/05) provides \$2,385,502⁶ to the Association. Under this Agreement, the federal sponsors provide training in aviation safety and awareness, meteorology, aero-medical factors and search techniques and procedures. In addition, financial support is provided for insurance, reimbursement for administrative and organizational expenses, flight training expenses and other authorized activities. In return, CASARA agrees to participate in aviation safety and promotion programs and encourage provision of air support search and rescue services from its members in response to JRCC taskings.

Funding of actual SAR operational activity in support of DND is reimbursed from the National SAR budget separate from the Contribution Agreement. This funding flows from DND through the 1 Canadian Air Division (1 Cdn Air Div).

CASARA augments CF primary search and rescue resources by providing fixed-wing aircraft and trained SAR volunteers who act as pilots, navigators, spotters and search coordinators as required and tasked by the CF JRCCs. CASARA also provides trained and certified spotters on CF SAR aircraft and personnel to assist in the set-up and running of deployed search headquarters.

CASARA actively promotes SAR prevention and aviation safety training among its own members and the civil aviation community with the objective of preventing accidents and potential SAR incidents. This activity is in support of Transport Canada which has the responsibility for the aeronautical SAR prevention program under the Aeronautics Act.

A significant activity performed by CASARA in support of the national search and rescue program is the ground-homing of Emergency Locator Transmitters (ELT's) which involves the early validation or resolution of ELT alerts that would otherwise require the tasking of primary CF SAR resources to investigate.

⁶Total annual funding is provided by DND to the Association from Contributions (Vote 10) in DND's main estimates. As defined in the Memorandum of Understanding, DND recovers \$400,000 of this amount annually from Transport Canada.



TABLE 1

CASARA Resource Profile 2003/04								
Total CASARA Units	CASARA Membership	Membership with SAR Certifications	Pilots	Navigators	Spotters	Ground Search and SAR Coordinators	Total Aircraft (owned, rented and chartered)	Total Volunteer Hrs in Support of DND/TC
107	2812	2691	337	519	1431	404	421	131,477.9

ORGANIZATION AND GOVERNANCE OF CASARA

In order to provide a national volunteer SAR capability, the Civil Air Search and Rescue Association provides a management and administration framework encompassing thirteen member organizations which represent all provinces and the three northern territories. A national Board of Directors represents all the member organizations and is responsible for the overall management of the Association. Each provincial or territorial CASARA member organization operates as a federally incorporated, not-for-profit volunteer organization. CASARA, as a national organization, provides an umbrella organization and framework which allows DND and Transport Canada to access a distributed network of aeronautical SAR volunteers.

There are 107 CASARA units distributed across Canada. Many of these units, in addition to being members of the national CASARA organization, are constituted as regional or municipal search and rescue organizations (such as the Sault Search and Rescue Inc., the Civil Air Rescue Emergency Service (CARES) Niagara, or London Air Patrol in London Ontario). In order to receive funding and assistance from its federal sponsors, CASARA and its member organizations must comply with the terms and conditions set forth in the Contribution Agreement (CA) and MOU. In addition, CASARA has entered into an agreement with each of its Provincial and Territorial members, providing each of them with funding and assistance. In order to ensure compliance and consistency in meeting the terms and conditions of the CA and MOU, a national CASARA policy manual⁷ and national training manual⁸ have been promulgated for application by all CASARA member associations.

⁷ The Civil Air Search and Rescue Association (CASARA) National Policy Manual (12 December 2000) provides national policy guidance on operational, administrative, financial and training matters.

⁸ Civil Air Search and Rescue (CASARA) National Training Manual (2001/03).



Accountability for Search and Rescue and CASARA Within the Department of National Defence: The primary responsibility for the provision of aeronautical search and rescue services in Canada and effective operation of the coordinated aeronautical and maritime SAR system has been assigned to DND.⁹ The Deputy Chief of Defence (DCDS) has operational responsibility for search and rescue. The Chief of Air Staff (CAS) is responsible for DND's strategic search and rescue policy and allocation of primary SAR resources as well as liaison with other SAR operating departments and agencies, both nationally and internationally.

The Commander of 1 Cdn Air Div is responsible for the operational command of all aeronautical search and rescue assets and to provide the interface between CASARA and the Department at the operational level. The D Air FE 3 staff at National Defence Headquarters is responsible to CAS for the development and promulgation of DND SAR policy and liaison with other departments, organizations and agencies involved in the National SAR Program. As such, D Air FE 3 is responsible for developing and monitoring the terms and conditions of the MOU and Contribution Agreement with CASARA.

Program Logic Model: A program logic model, in graphic form, is found at Annex A. This represents the National Search and Rescue program linkages involving DND, Transport Canada and CASARA, and the activities that contribute to the program's intended goals and objectives.

⁹ National Search and Rescue Manual May 1998. B-GA-209-001/FP-001.



PART 3 – EVALUATION THEMES, ISSUES AND OBSERVATIONS

THEME 1 – CASARA’S CONTRIBUTION TO THE DND/CF AND TRANSPORT CANADA MANDATE

In 1986, the Government of Canada directed the establishment of a National Search and Rescue Program. This program is a cooperative effort by federal, provincial and municipal governments along with other search and rescue organizations. The Department of National Defence has been assigned the primary responsibility for the provision of aeronautical search and rescue services and effective operation of the coordinated aeronautical and marine SAR system. Transport Canada has the primary responsibility for the provision of the aeronautical search and rescue prevention program under the authority of the Aeronautics Act. CASARA contributes to DND/CF and TC mandates for SAR by fulfilling the CASARA responsibilities established by the MOU between DND, TC and CASARA. The following paragraphs identify the seven areas of responsibility that CASARA has agreed to undertake (as set out in the MOU) and how CASARA is currently fulfilling each responsibility:

- a. **CASARA Responsibility: Encourage provision of suitable aircraft and crews for use in the conduct of Authorized Activities.**
 - During FY 2003/04, CF primary resources were augmented by a CASARA volunteer membership of 2,812; 97 per cent of which were certified to standards approved by DND as trained SAR volunteers. Those individuals qualified in SAR techniques include 337 pilots, 519 navigators, 1431 spotters, 172 SAR coordinators and 232 ground search personnel. In addition, CASARA made 421 aircraft available for SAR tasking (255 owned by CASARA members, 131 leased and 35 chartered by CASARA).
- b. **CASARA Responsibility: Encourage provision of such air search support services as may be, from time to time, requested by a JRCC.**
 - During FY 2003/04 CASARA responded to 259 JRCC taskings (169 air tasks and 90 ground tasks). Some of these taskings were conducted jointly with DND, while others were completed independently by CASARA. In so doing, CASARA logged 768 flying hours, 521.4 vehicle hours and 7,413.1 total volunteer hours. However numbers alone do not adequately reflect the scope and importance of CASARA’s contribution. CASARA volunteers play the following roles in facilitating DND search and rescue responsibilities:
 - CASARA’s response to ELT alarms, whether resulting from a real emergency or an unintentional activation, is extremely important to the effectiveness of the DND SAR program. In the case of an actual emergency, CASARA aircraft, being located throughout Canada, can at times begin searching before a primary SAR aircraft can reach the search area. In the case of an unintentional activation, the need to launch primary SAR aircraft is precluded if



CASARA can quickly locate the beacon, by air or ground search, and confirm that it is a false alarm. This saves not only the cost of an unnecessary launch; it also prevents needless use of primary SAR crew hours (limited to 15 hours a day) that may be required to respond to a real emergency.

- At the mutual request of DND, NAV Canada and Transport Canada, CASARA is actively expanding its capability of “On Airfield” ground homing of ELTs. Many of the false ELT alarms occur at local airports. At some municipal airports, if CASARA was not available to check ELT alerts there is no other government resource at the airport to locate the ELTs. During FY 2003/04, CASARA had 232 personnel certified to perform ground homing of ELTs (using vehicles or on foot).
- In addition to being employed as search aircraft, CASARA aircraft also have the capability to be employed as communications platforms. During a search, all aircraft must maintain communications with the search headquarters. At times a primary SAR aircraft is removed from a search role because it has to fly at high altitudes just to serve as a communications link for other primary SAR aircraft that are searching at lower altitudes. Having a CASARA aircraft available to fly at the high altitude to provide the communications link can free up a primary SAR aircraft to be used for actual searching.
- CASARA assists in the set-up and running of deployed search headquarters. CASARA’s knowledge of local facilities, transportation, communications equipment and local crew accommodations, can expedite the establishment of a deployed headquarters. Some CASARA units have permanent access to equipped facilities, others have a local plan that can be implemented to establish such a facility should the need arise. CASARA units have been known to have the deployed headquarters set up and ready for use as soon as the CF primary resources arrive. This accelerates the actual search activity. CASARA members can also augment the CF search headquarters staff. Those CASARA members certified as SAR coordinators, of which there were 172 in FY 2003/04, can serve in the capacity of deputy search masters.
- CASARA members, who are part of the local flying community, possess local knowledge that can assist in the search activity and reduce the burden on the primary SAR personnel. Knowledge of local terrain, local flying habits, and other search organizations that may become involved, such as municipal authorities or the local Royal Canadian Mounted Police (RCMP) (of which CASARA volunteers may even be members) can aid in planning and conducting the search. Knowledge of local leadership, press, language (particularly in the far north) and the family of the missing persons has enabled CASARA volunteers to assist primary SAR personnel in dealing with the public and the personal communications challenges that can accompany a search.



- CASARA is the primary source of SAR spotters. The CF no longer maintains a cadre of trained spotters who can be taken away from their primary duties on a moment's notice for an indefinite period of time. CASARA spotters serving aboard CF aircraft also relieve the CF SAR technicians from having to perform the fatiguing spotting task. This is important because once a downed aircraft has been located the SAR spotting task ceases and the SAR technicians must undertake the rescue tasks. This may require them to immediately parachute down to the crash site and aid casualties. In FY 2003/04 CASARA had 1,431 certified SAR spotters available for duties on CASARA and CF aircraft.

c. CASARA Responsibility: Encourage participation in DND SAR training activities as conducted from time to time.

- CASARA actively encourages participation of its members in DND SAR training activities. At the end of FY 2003/04, 2,691 CASARA members (95.7 per cent) were certified in at least one SAR role through training programs monitored by DND. In addition to receiving training, CASARA members contribute to the training of primary SAR personnel. They have provided ELT beacon “ground targets” and realistic simulated crash sites for training of CF aircrew and SAR technicians. They have also provided the ground transportation to pick up SAR technicians after they have jumped into the simulated crash site and returned them quickly to their primary duties. CASARA also assists in the set up, and is a participant in, the annual National SAR Exercise, contributing crewed aircraft, spotters aboard CF aircraft and simulated casualties.

d. CASARA Responsibility: Encourage participation in TC aviation safety promotion activities as identified in official planning documents.

- CASARA is an important contributor to the promotion of aviation safety within the flying community. In FY 2003/04 CASARA members spent 6,741 volunteer hours giving 165 safety courses to CASARA members, flying club members and other private aviators. They also spent 3,353.6 volunteer hours attending 93 courses conducted by Transport Canada.
- As stated in the National Search and Rescue objective, the National Search and Rescue Program attempts to reduce the number and severity of SAR incidents through preventable measures focused on owners and operators most commonly involved in SAR incidents.¹⁰ CASARA's national presence and credibility within the flying community are important factors in CASARA's support of Transport Canada's SAR prevention program. CASARA is helpful in getting the target aviation audience to come out to safety events and briefings. CASARA can also provide facilities for the events. CASARA members are themselves extremely safety savvy. They are fully conscious of what is involved when an aviator goes missing. As a result they are conscientious and appreciative of the importance of checking ELTs, filing accurate flight plans, dressing appropriately for the season, having appropriate and adequate survival gear, etc. CASARA members' knowledge, credibility

¹⁰ National SAR Manual B-GA-209-001/FP-001.



and presence throughout the Canadian aviation community aids in the day-to-day appreciation and promotion of “good airmanship”. A polite reminder from a fellow flyer is at times more effective than a similar comment from a government representative. This can in turn prevent accidents from ever occurring.

e. ***CASARA Responsibility: Develop and conduct appropriate search and aviation safety training programs as required to augment air search resources and to promote general aviation safety awareness.***

- CASARA units conduct their own training programs, which align with CF SAR standards, to maintain their proficiency. CASARA maintains a comprehensive training manual that provides a basic training reference for all CASARA units. Each unit’s proficiency must be inspected and validated by CF liaison officers at least every 24 months or the unit loses its operational status and its ability to be tasked by JRCCs to participate in searches. In FY 2003/04 CASARA conducted 1,374 flying exercises (involving 5,198.9 flying hours and 46,264.2 volunteer hours) and 736 ground exercises (involving 38,590.1 ground kilometers and 37,391.6 volunteer hours).¹¹

f. ***CASARA Responsibility: Arrange insurance coverage to provide financial protection to CASARA, the Member Organizations, and the Members for the risks of hull and machinery losses, damage losses, public liability losses, and other coverage deemed necessary by the Board of Directors.***

- CASARA fulfills this requirement.

g. ***CASARA Responsibility: Ensure compliance with the rules established by CASARA, this MOU and official Government documents.***

- CASARA maintains a comprehensive manual that sets forth the policies that must be complied with by each Member Organization in order for CASARA to fulfill its obligations under the terms and conditions set forth in the Memorandum of Understanding and the Contribution Agreement.

¹¹ These numbers include the training conducted in conjunction with the CF and that conducted independently by CASARA.



THEME 2 – CASARA PROGRAM PERFORMANCE – EFFECTIVENESS AND EFFICIENCY

CASARA is a volunteer organization, whose membership is comprised solely of dedicated and committed individuals with an interest in aeronautical search and rescue. As CASARA is a volunteer organization, there are no quantitative performance expectations or performance measures stipulated in the Contribution Agreement or Memorandum of Understanding (2004/05) between DND, Transport Canada and CASARA. In the Contribution Agreement, the Association's obligations are limited to the requirement that "Association Members shall volunteer their time without profit or personal gain..." and to fulfill administrative requirements regarding budgeting and record keeping.¹²

The Memorandum of Understanding between the federal sponsors of CASARA and the Association identify seven responsibilities to be carried out in return for the funding provided. These responsibilities, (discussed in Theme 1), while contributing to the goals and objectives of the program, are expressed in general terminology and are difficult to measure.

- *encourage participation* in Department of Transport aviation safety promotion activities;
- *encourage participation* in DND search and rescue training activities;
- *encourage provision* of air search support services as may be requested;
- *encourage provision* of suitable aircraft and crews; and
- *encourage compliance* with the rules established by the Association.

While reflective of the volunteer status of the organization, these responsibilities are not amenable to measurable performance objectives. Additional responsibilities of developing and conducting search and aviation safety training programs and arranging insurance for the Association and its members are more specific.

A program's success is typically reflected in the achievement of its program objectives. As search and rescue is largely a reactive activity, measurement of activity levels alone does not properly reflect the effectiveness or cost-efficiency of CASARA. However, there are sufficient indications through the identification of the capabilities and activities performed by CASARA in support of the National SAR Program, that provide a measure of its effectiveness and relative cost-efficiency.

¹² Para 5, CASARA Contribution Agreement, January 2004.



The federal contribution for 2004/05 of \$2,385,502¹³ funds the administrative, organization and training costs for CASARA. This enables CASARA to have in place an organizational capability and management framework that facilitates a network of volunteer resources across Canada to augment and support federal resources in fulfilling their SAR mandate. The bullets below present, in relative terms, the capability, resources, and levels of activity provided by CASARA that act as indicators of the effectiveness and efficiency of the Association (summary provided at Annex B to this report).

- Actual DND spending on the SAR program (2003/04) was \$161,589,000.¹⁴ DND's portion of the federal contribution to CASARA (\$1,916, 022 in 2003/04) was only 1.19 per cent of DND's program costs for SAR.
- The total federal contribution to CASARA of \$2,385,502 (2004/05) represents 1.58 per cent of the combined DND and Transport Canada planned spending on SAR for 2004/05.
- CASARA is able to augment the CF primary SAR resources that are located in five locations (Comox, BC; Winnipeg, MB; Trenton, ON; Greenwood, NS; and Gander, NL) with 107 additional CASARA units located in ten provinces and three northern territories. The five primary SAR squadrons are responsible for SAR coverage of over 18,000,000 sq kms. Between 1998 and 2001, 87 per cent of all air and 'unclassified' SAR incidents, occurred within 100 nautical miles of a CASARA unit.¹⁵
- Thirty-one (31) CF primary SAR aircraft (which include 6 CC115 Buffalo, 15 CH149 Cormorant helicopters and 10 CC130 Hercules) are augmented by an additional 255 member-owned fixed-wing aircraft (which can be augmented by leased and chartered aircraft) located at CASARA units across Canada (member owned, rented and chartered).
- In 2003/04, CASARA units responded to 259 SAR taskings from CF Joint Rescue Coordination Centres (JRCCs) and acted either autonomously or in conjunction with CF primary SAR resources. One hundred and sixty-nine (169) of those tasks involved deploying aircraft and 90 were ground taskings involving the location and verification of ELT beacon alerts. The majority of ground searches involving the "homing" of ELT alarms are in response to false alarms.¹⁶ Validation of false alarms by CASARA avoids the requirement to activate primary CF SAR resources and aircraft. Accurate cost avoidance in these situations cannot be calculated. However, for illustrative purposes only, the following cost avoidance calculation is made using the average *hourly operating costs* of the three primary SAR aircraft.¹⁷ Assuming a 60 per cent false alarm rate and two hours flight time to 'home'

¹³ As per Federal Contribution Agreement 2004/05.

¹⁴ National Defence 2004-2005 Estimates. Part III – Report on Plans and Priorities.

¹⁵ Director of Air Staff Operational Research (DASOR). *Analysis of Optimal CASARA Locations*. 2004.

¹⁶ Estimate based on expert opinion from JRCC staff and CASARA members. No annual statistics are maintained in this area.

¹⁷ DND/CF Cost Factors Manual 2004/2005. The average hourly operating costs (when calculating recoveries from other government departments) for the CC115, CC130 and CH 149 is \$3810.00. The average hourly full cost when calculating recoveries from non-government agencies is \$10,991.00.



each ELT alarm, the number of CASARA ground searches conducted in 2003/04 would have resulted in cost avoidance to the CF of \$411,480. Using average *hourly full costs* for operation of primary SAR aircraft, a cost-avoidance of \$1,187,028 is achieved. Annex C to this report presents actual JRCC taskings of CASARA that resulted in CF primary SAR cost-avoidance.

- Seven hundred and sixty-eight (768) hours of CASARA flying time was flown in response to JRCC SAR taskings in 2003/04. The average incremental cost paid to CASARA for these hours is approximately \$200/hr¹⁸ for a total of \$153,600. While a comparable number of hours that would be required using primary CF SAR aircraft cannot be accurately determined,¹⁹ the average CF ‘operating cost’ to replace this capability would be \$2,926,080. Full costs to DND to provide this capability (768 aircraft search hours) would be \$8,441,088.²⁰
- JRCCs provided anecdotal evidence that CASARA units have a response rate to JRCC taskings of greater than 95 per cent. Inability to respond to taskings has been limited primarily to weather conditions.
- The total of all incremental costs of CASARA providing aircraft, fuel, facilities, equipment and 7413 volunteer hours in response to JRCC taskings (2003/04) was \$254,859.²¹ This amount was paid from DND’s national SAR budget.
- The total number of volunteer hours reported by CASARA in their 2003/04 Annual Report in support of DND SAR activities, including participation in JRCC taskings, ground and flying training, exercises and administrative duties was 121,383 hours. An additional 10,094 volunteer hours were made available either to deliver or attend aviation safety and promotion courses in support of Transport Canada’s role in aeronautical search and rescue prevention.

Conclusion – CASARA Program Effectiveness and Efficiency: There are qualitative and quantitative indicators of the capabilities and contributions made by CASARA that demonstrate there is both an economic as well as an operational-effectiveness return on the annual federal contribution to CASARA. These indicators are summarized in tabular form at Annex B. Using only two proxy measures – validation of ELT alarms and CASARA flying hours in support of JRCC taskings – demonstrates potential cost avoidance of \$3.34 M to \$9.63 M to DND, based on 2003/04 levels of activity.

¹⁸ CASARA Contribution Agreement 2004. Para 4.1.5.4 Formula to determine “Eligible Costs of Authorized Activities”.

¹⁹ An accurate calculation of CF SAR primary resources cannot be calculated due to type, speed and capability of CF aircraft and transit time involved from CF Bases to incident locations.

²⁰ Note that this calculation is for search time only on site and does not include return transit time for CF aircraft to arrive at the search site. Transit time could vary from one hour to more than ten additional hours per search incident.

²¹ Incremental costs includes meals, lodging and incidental costs following Treasury Board Guidelines and an amount for the use of an Association aircraft as determined in the Contribution Agreement.



As search and rescue is a 'reactive' program, measures of operational activity alone do not properly account for the effectiveness or cost-efficiency of CASARA. As described above, the federal contribution of \$2,385,502 (2004/05) provides the funds to ensure that a significant search and rescue capability exists in a volunteer organization to support, augment, and offer a responsive, locally-based search capability to assist DND and TC deliver their SAR mandates to all Canadians. While 'proxy' measures have been provided that indicate the relative cost efficiency of CASARA, it must be noted that no attempt has been made to calculate the value of volunteer time in general, or the value-added benefits of the administrative support, local knowledge, personnel availability, infrastructure and community involvement that have been discussed under Theme 1. These contributions are in addition to the "scenario-based" proxy calculations that have been made. (See Annex C.)

Total federal government expenditures for CASARA, including funding fixed costs in the form of a contribution payment and incidental costs (2003/04) for operational taskings, was \$2,570,881. This represents less than 1.6 per cent of the total federal expenditure on search and rescue by DND and Transport Canada. The Review Team concludes that, in the absence of CASARA, if this amount was expended on additional federal primary search and rescue assets, it would not provide a comparable level of search capability, geographic coverage, responsiveness or national SAR awareness that is achieved through the sponsorship of CASARA.

The Evaluation Team recommends that the Department of National Defence and Transport Canada continue to sponsor CASARA through a Contribution Agreement to provide organized and trained volunteer SAR assistance.



THEME 3 – CASARA MANAGEMENT ISSUES

Theme 3 is a discussion and analysis of management issues that surfaced during the review that contribute to or impact the effectiveness and efficiency of CASARA in its supporting relationship to DND and Transport Canada. Findings and conclusions of the evaluation team are included in the discussion of each issue, along with recommendations where appropriate.

Funding of CASARA

Transport Canada's Contribution to CASARA Funding

When CASARA was first established in 1986, the total federal contribution amount was \$800K, split evenly between DND and TC, with each Department providing \$400K. TC has maintained a contribution level of \$400K with each subsequent contribution renewal while DND's contribution has continued to rise to the current level of \$1,935,502. In 1986, TC had both operational and regulatory air navigation services responsibilities. With the establishment of NAV Canada, TC retained only a regulatory authority. This in turn resulted in the TC relationship with CASARA being devolved to TC's regions. As a result, the CASARA activities that are carried out in support of TC vary from region to region.

The evaluation team concluded that all parties to the Memorandum of Understanding (DND, TC and CASARA) would benefit from a reassessment of CASARA's accountability and governance relationship with TC. Issues such as TC's current expectations, specific activities CASARA is to undertake, the frequency of the activities and to what standard they are to be performed should be reassessed.

CASARA's Support to Other SAR Agencies

Some CASARA units have separate MOUs with other agencies (such as the RCMP, Parks Canada, municipalities or local police) whereby CASARA can be reimbursed for specific costs incurred in providing operational support to those agencies. This does not disadvantage DND. Administratively there is no overlap between jurisdictions in paying for services. Moreover, as DND is the sole funder of CASARA's operational capability through the Contribution Agreement, taskings by the JRCCs always receive first priority. In addition, while these other agencies are users of CASARA's services, only DND has the right to monitor and evaluate the operational proficiency standards that must be maintained by the CASARA units (as further explained under "DND/CF Support to CASARA" below). Furthermore, CASARA's participation in actual SAR operations for other agencies is encouraged as it is a major factor in motivating volunteers to maintain their CASARA membership and competence levels. CASARA's experience has been that volunteers who do not get a chance to use their training for real world events lose interest and leave the organization.

The evaluation team concluded that CASARA's support to other agencies benefits DND and does not interfere with CASARA's support of DND.



Appropriateness of the Existing Funding Mechanism

As noted earlier funding options are being reviewed separately within DND, and this evaluation was cognizant of this analysis. In the course of the evaluation, some consideration was given to alternative funding mechanisms by the evaluation team. At Annex D to this report, the three funding alternatives available through the Treasury Board of Canada Policy on Transfer Payments (1 June 2000), as well as the option of contracting for additional SAR capabilities, are considered.

The evaluation team concluded that the current use of a Contribution Agreement to fund the SAR capability and services provided by CASARA remains the most appropriate funding arrangement.

DND/CF Support to CASARA

Strategic Level Support

The National Defence Headquarters D Air FE, within the CAS, is responsible for managing the strategic relationship between DND and CASARA. D Air FE has administrative responsibility for the periodic renewal of the CASARA Memorandum of Understanding and the Contribution Agreement. In its' strategic management role, D Air FE has commissioned an operational research analysis project to answer the question: "Where should CASARA units be located to provide maximum benefit to the Canadian SAR system?"

The evaluation team concluded that the results of the operational research analysis would assist in providing strategic guidance to CASARA on future expansion activities.

Operational Level Support

The 1 Canadian Air Division A3 Search and Rescue Section is responsible for the operational interface between DND and CASARA. One component of this relationship is the JRCCs, which report to 1 Cdn Air Div and task CASARA operationally. Another component of the relationship is that of CASARA liaison personnel. 1 Cdn Air Div has directed the JRCCs and the operational SAR squadrons to appoint CASARA Liaison Officers (CLOs). These CLOs assist CASARA units in the training of their members and perform operational evaluations of the units. The SAR squadrons also appoint non-commissioned members (referred to as CASARA NCMs) to liaise with CASARA units and assist the CLOs.



The CLO and CASARA NCM positions provide the critical link between DND and the CASARA units to validate their level of competence and SAR qualifications and to certify that they are ready to be tasked for JRCC operations. Units must be evaluated once every 24 months or they will lose their operational status. Units that have lost operational status can only provide spotters for searches until recertified as operational.

The CLOs and CASARA NCMs also serve an important role in the recruitment and motivation of CASARA members. Events such as having a CF Hercules aircraft and SAR crew come to a CASARA unit to provide SAR spotter training is immensely important to the CASARA volunteers. The CASARA members like to be involved with the CF SAR professionals and learn from their competencies and experiences.

1 Cdn Air Div provides the temporary duty funds for CLOs and CASARA NCMs to attend meetings, provide training and conduct evaluations. Budget constraints within the CF have resulted in a reduction of the CF's operational support of CASARA (funding for 2004 and 2005 is currently set at \$99k and \$118K respectively). Several CASARA units in Quebec and Northern Canada have lost their operational status because CLOs have been unable to conduct operational evaluations within the requisite 24-month period. This has resulted not only in the units not being certified for JRCC taskings, but has also had a negative effect on recruitment and retention of CASARA volunteers at those units.

CASARA training sessions have also had to be cancelled due to the unavailability or unavailability of CF Hercules aircraft. This can negatively impact not only the CASARA training but also the commitment of volunteers.

The evaluation team concluded that funding levels for 1 Cdn Air Div operational support of CASARA should be carefully reviewed and managed to ensure that the benefits of establishing and maintaining CASARA under the contribution agreement are not lost by under funding 1 Cdn Air Div's operational support responsibilities. It is recommended that such a review be conducted.

CASARA Membership

The NSS has produced and distributed a comprehensive questionnaire to CASARA members to determine if there may be problems sustaining CASARA's volunteer membership. In the covering letter to the questionnaire, the NSS points out that "Statistics Canada's 2000 *National Survey on Giving, Volunteering and Participating* revealed a 13 per cent decrease in volunteers of all kinds in Canada since 1997, despite an almost 2.5 per cent increase in those aged 15 years or older in the same period."

The evaluation team concluded that the results of this NSS questionnaire, when made available, should reveal whether there are volunteer issues impacting CASARA and identify possible actions that might be taken as a result.



Changing SAR Technology

In 2009, search and rescue satellites will no longer monitor 121.5 MHz ELTs. The satellites will only monitor 406 MHz ELTs. While 121.5 MHz ELTs provide only a distress beacon, the 406 MHz beacons can also transmit additional information such as the owner's identification. Transport Canada has not yet decided if the more expensive 406 MHz ELTs will be made compulsory.

The satellite monitoring change and the uncertainty regarding mandatory use of the 406 MHz beacons may affect the JRCC's employment of CASARA. If 121.5 MHz beacons remain in service, they will only be detectable by an aircraft over-flight. In this case, CASARA's role in locating these beacons may increase. When a 406 MHz beacon alert is detected, the additional information available to the JRCCs may increase their response options, such as attempting to contact the owner directly to determine if the alert is real or false. This could reduce CASARA's role in locating false ELTs.

The evaluation team concluded that the changes in SAR ELT technology might affect CASARA's future roles.

Risk if there was no CASARA

The evaluation team concluded that the following potential impacts on DND's SAR operations could result if CASARA did not exist:

- Response time would increase for searches that are in the vicinity of a current CASARA unit and not close to a CF SAR squadron. Time is of the essence in commencing a SAR search; the first 72 hours are considered to be the most critical if survivors are to be found and rescued. Between 1998 and 2001, 87 per cent of air and "non-classified" SAR incidents were within 100NM of a CASARA unit.
- The CF would have to fly more hours on searches where CASARA aircraft and crews could have conducted a portion of the search. This would both increase the cost of the search and further tax the CF primary SAR resources, especially in major searches that can go on for days or weeks.
- The CF would have to either find an alternative approach to locating and deactivating false ELT alerts or use primary SAR resources to respond to all ELT signals – even those believed to be false. Using primary SAR resources is not only expensive by comparison to using CASARA but also uses CF crew time which may be needed to respond to an actual emergency (see Annex C for scenario-based cost-avoidance calculations).
- The CF would have to find an alternative source of SAR spotters or use military members in that role. Any alternative spotters would need to receive some training before they could be employed operationally. Use of CF personnel would take them away from their primary duties with commensurate impact on other CF operations.
- The CF would lose ready access to local knowledge that is provided by CASARA members, which contributes to an effective and efficient search.



- The CF would no longer have a single focal point for its dealings with any remaining independent volunteer SAR organizations dispersed throughout the country. Organizationally and administratively the result could be more time consuming and less efficient, as individual MOUs and relationships would have to be struck and maintained with each independent organization.

Strategic Visioning for CASARA

During the 1990's, an assessment of CASARA was included in several evaluation, audit and review reports that were conducted on search and rescue²². In all instances, CASARA was determined to be a positive and beneficial contributor to SAR. In the CRS and Auditor General reports, it was recommended that greater use be made of CASARA and that their services be expanded. All evidence suggests that CASARA remains a cost effective SAR force multiplier within the National SAR Program. What is not apparent is that a clear vision of CASARA's future exists that would serve as a guide for any role changes or expansion efforts. Currently, there is no standing forum of which DND, TC and CASARA are members that would facilitate such a visioning exercise. However, there are a number of current activities and factors that would support DND, TC and CASARA undertaking a collective and comprehensive strategic visioning exercise on CASARA's future. These activities and factors are:

- The apparent need for a reassessment of CASARA's accountability and governance framework with TC;
- The strategic guidance to CASARA on future expansion activities that will flow from the results of the operational research analysis;
- The growing interest in Canada's northern sovereignty and CASARAs' possible contribution as a current northern presence with a possible expanded role in light of increased economic development in the north;
- Possible strategic guidance on the recruitment and retention of CASARA volunteers that can be derived from the results of the NSS volunteer questionnaire;
- Current expansion of ELT homing capabilities, the implications for CASARA should Personal Locator Beacon (PLB) use increase in Canada, and continued use of 121.5 MHz beacons when they are no longer satellite monitored in 2009; and
- The evaluation team concluded that DND, TC and CASARA would all benefit from the development of a collective and comprehensive vision of CASARA's future. It is recommended that such a vision be developed.

²² NDHQ Program Evaluation E1/90 DND Search and Rescue Program, 1258-80 (DGPE) 22 June 1992; 1992 Report of the Auditor General – Chapter 8 Search and Rescue; SAR Volunteers Review Approved by the Interdepartmental Committee on Search and Rescue (ICSAR) 10 October 1996.



ANNEX A – CIVIL AIR SEARCH AND RESCUE ASSOCIATION (CASARA) PROGRAM LOGIC MODEL

Figure 1

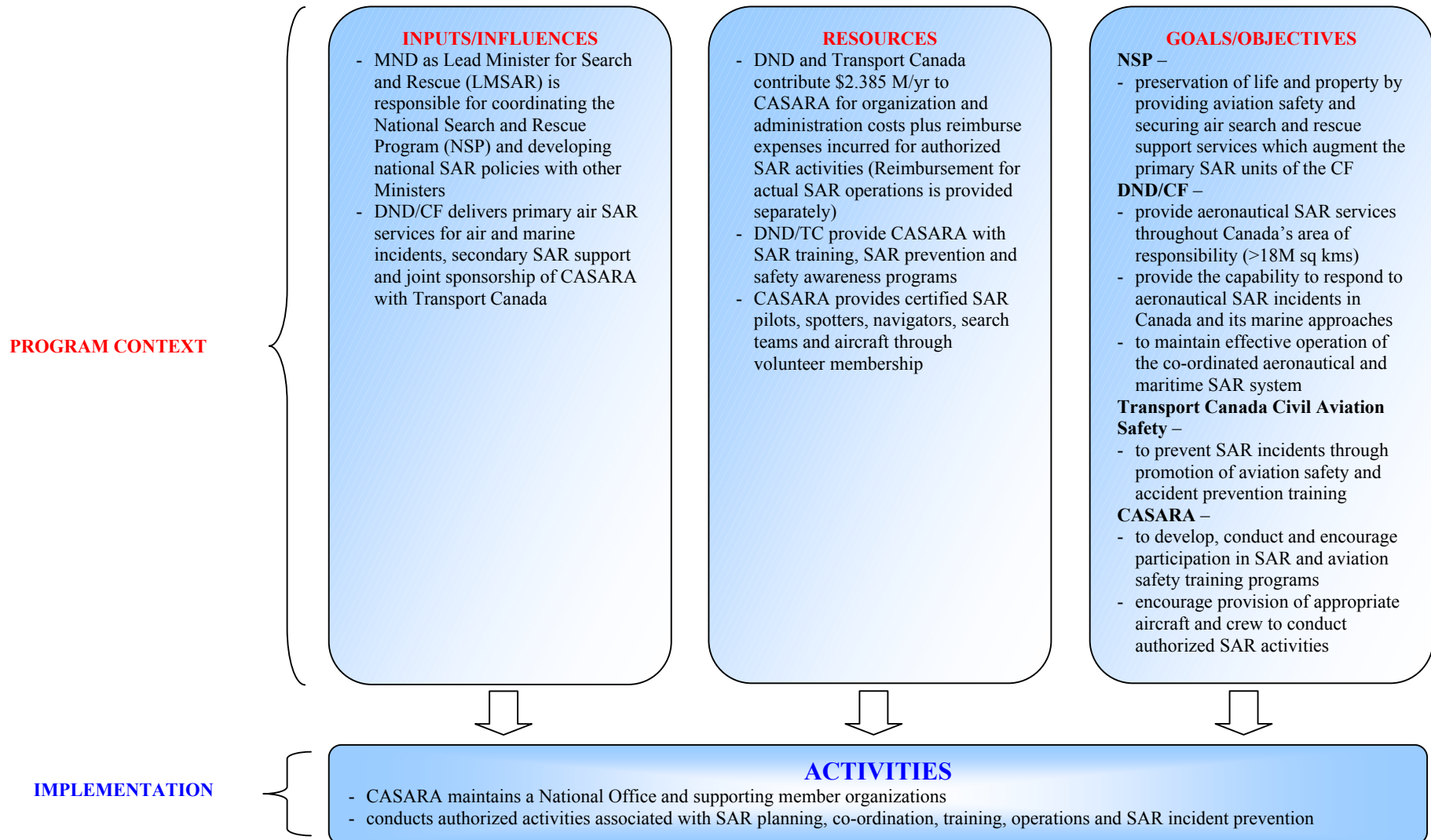
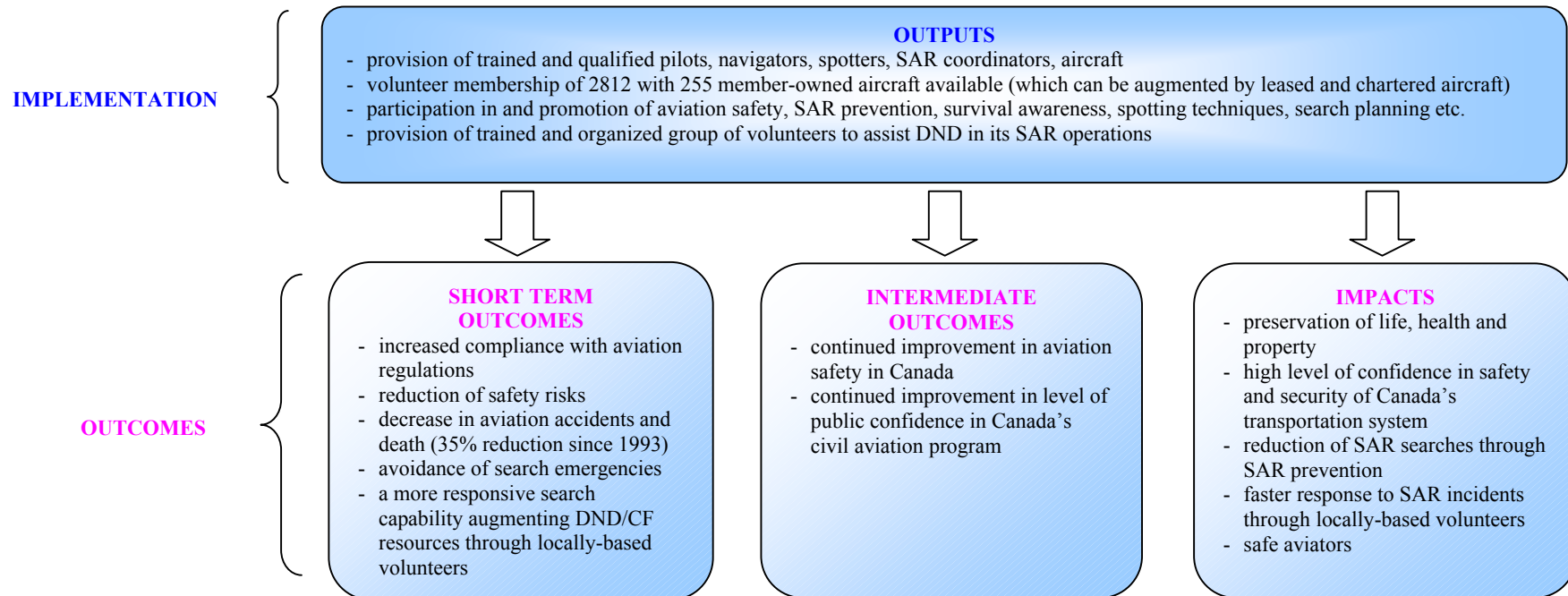


Figure 1 (cont'd)



ANNEX B – SUMMARY OF QUALITATIVE AND QUANTITATIVE INDICATORS OF CASARA’S CONTRIBUTION TO THE NATIONAL SEARCH AND RESCUE PROGRAM

Comparative Review of SAR Resource Contribution (2003/04)

Canadian Forces	Civil Air Search and Rescue Association (CASARA)
\$161,589,000 (DND Search and Rescue Program Costs)	DND Contribution to CASARA as a % of total DND Search and Rescue Program 1.19%
Number of SAR Squadrons 5 (responsible for > 18,000,000 sq kms)	Number of CASARA Units 107 (87% of Units within 100 NM of incidents 1999-2001)
Number of Primary SAR Aircraft 31 (16 fixed-wing, 15 rotary wing)	Number of CASARA member-owned aircraft 255 (all fixed-wing aircraft)
<i>Approximate DND SAR Program Full-Time Equivalent</i> 624 (Includes capital projects staff, operations, support, maintenance etc.)	Number of CASARA Volunteers 2,812



Illustrative Cost Comparisons – CASARA and DND

Incremental Cost for CASARA Flying Hours JRCC Operational Taskings 2003/04	DND Cost-Avoidance
<p>\$154,000</p>	<p><i>Using Operating Costs</i></p>
	<p>Homing False ELT Alarms – \$411,480</p>
	<p>Replacing CASARA</p>
	<p>Operational Flying Hours – \$2,926,080</p>
	<p>Total Cost Avoidance – \$3,628,560</p>
	<p><i>Using Full Costs</i></p>
<p>Homing False ELT Alarms – \$1,187,028</p>	
<p>Replacing CASARA</p>	
<p>Operational Flying Hours – \$ 8,441,080</p>	
<p>Total Cost Avoidance – \$ 9,628,108</p>	



ANNEX C – CASARA CASE STUDIES 2003/04 – EXAMPLES OF EFFECTIVENESS AND EFFICIENCY

1. Halifax Case #1481 – 17 August 2003, 406 MHz EPIRB at Yarmouth, NS. CASARA ground team used for 2 hrs, 2 min. Signal traced to electronics store. Total cost \$15.40. Saved 1 hr transit for Hercules or 2 hrs transit for Cormorant plus search time.

CASARA Costs	DND Cost-Avoidance Operating Costs ¹	DND Cost-Avoidance Full Costs ²
\$15.40	CC130 – \$4661.00 + search time or CH149 - \$7540.00 + search time	CC130 – \$13,944.00 + search time or CH149 - \$16,354.00 + search time

2. Halifax Case #2068 – 23 November 2003, 406 MHz EPIRB at Dartmouth, NS. CASARA ground team used for 3 hrs, 51 min. Signal traced to address in industrial park. Total cost \$39.60. Saved 45 min transit for Hercules or 1.5 hrs transit for Cormorant plus search time.

CASARA Costs	DND Cost-Avoidance Operating Costs	DND Cost-Avoidance Full Costs
\$39.60	CC130 – \$2097.00 + search time or CH149 – \$5665.00 + search time	CC130 – \$6297.00 + search time or CH149 – \$12,265.00 + search time

3. Halifax Case #0186 – March 2004, ELT at Baddeck, NS. CASARA ground team used for 3 hrs, 30 min. Signal traced to Bell Express Vu TV system. Total cost \$103.58. Saved 2 hrs transit for Hercules or 4 hrs transit for Cormorant plus search time.

CASARA Costs	DND Cost-Avoidance Operating Costs	DND Cost-Avoidance Full Costs
\$103.58	CC130 – \$9322.00 + search time or CH149 – \$15,080.00+ search time	CC130 – \$27,988.00 + search time or CH149 – \$32,708.00 + search time

¹ DND/CF Cost Factors Manual 2004/2005. The hourly operating costs are used when calculating recoveries from other government departments.

² DND/CF Cost Factors Manual 2004/2005. The hourly full costs are used when calculating recoveries from non-government agencies.



ANNEX C

4. Halifax Case #1499 – 19 August 2003, OVERDUE canoe Ungava Bay. CASARA tasked and provided spotters for military aircraft and 14+ hrs flying time in a private Twin Otter on this Major SAR. Total Cost \$53,767.02. Saved 10 hrs transit plus 14.0 search time for another CC130 or CP140 from Greenwood or Trenton.

CASARA and Chartered Aircraft Costs	DND Cost-Avoidance Operating Costs	DND Cost-Avoidance Full Costs
\$53,767.02	CP140 - \$322,344.00 or CC130 - \$111,864.00	CP140 - \$730,608.00 or CC130 - \$335,856.00

5. **JRCC Trenton:** JRCC Trenton used 45 CASARA/SERABEC resources (aircraft or vehicle) in 36 incidents during FY 2003/04. Thirteen (13) incidents used aircraft, the rest were ground searches. Of these 36 incidents, 28 were resolved without requiring the use of a primary air SAR asset. It is safe to assume that the unavailability of CASARA would have resulted in the tasking of a primary SAR asset. This leaves 8 incidents where CASARA was used in conjunction with primary SAR in order to prosecute an ELT or a crash. Should CASARA be unavailable for a ground search, the system would have to rely on a primary SAR resource or local police forces to prosecute incidents. In major urban centre, this can prove to be difficult as local police are generally very busy and dispatching a unit to the local private airport to have an ELT turned off is very low in their priority list.

6. **Victoria Case 0793 ELT CRESTON:** This was an ELT that was on, and went off after about an hour. CASARA conducted the search and talked to fellow flyers at Creston A/P and determined that an A/C that landed earlier had been the culprit. This is an example of a local CASARA member getting information that we would not have been able to receive. The Coordinator did not task the Buffalo CC115, believing the ELT to be close to the field and confident that CASARA could resolve the incident.

CASARA Search Time	CASARA Distance Travelled (nautical miles)	CF Cost-Avoidance		
		CF SAR Time	CF SAR Distance (nautical miles)	Cost-Avoidance (operating costs / full costs)
0.7 hrs	10.7 NM	3.2 hrs + search time	335 NM	CC115 – \$9603.00 / \$34,566.00



ANNEX C

7. **Victoria Case 0952 ELT HOUSTON:** An ELT was picked up near Smithers, off the field. The Coordinator tasked CASARA right away. From case formation to resolution was 3.5 hours. The Buffalo, which was not tasked, would have just been arriving.

CASARA Search Time	CASARA Distance Travelled (nautical miles)	CF Cost-Avoidance		
		CF SAR Time	CF SAR Distance (nautical miles)	Cost-Avoidance (operating costs / full costs)
3.0 hrs	61.2 NM	2.5 hrs + search time	254 NM	CC115 – \$7,5025.00 / \$27,005.00

8. **Victoria Case 1314 WHITEHORSE AIRPORT ELT:** The FSS did not have the personnel to send out to try to home this signal. It was believed to be on the field, but not certain. A ground homing resolved this in lieu of a Buffalo tasking.

CASARA Search Time	CASARA Distance Travelled (nautical miles)	CF Cost-Avoidance		
		CF SAR Time	CF SAR Distance (nautical miles)	Cost-Avoidance (operating costs / full costs)
2.6 hrs	1.0 NM	7.0 hrs + search time	744 NM	CC115 – \$21,007.00 / \$75,614.00

9. **Victoria Case 1630 ELT FORT NELSON:** A strange ELT signal was detected by the FSS. CASARA determined that it was faulty FSS equipment that caused the case formation. Without their assistance, we would have had to send a Buffalo.

CASARA Search Time	CASARA Distance Travelled (nautical miles)	CF Cost-Avoidance		
		CF SAR Time	CF SAR Distance (nautical miles)	Cost-Avoidance (operating costs / full costs)
1.0 hrs	1.0 NM	5.0 hrs + search time	500 NM	CC115 – \$15,005.00 / \$54,010.00



ANNEX D – ASSESSMENT OF EXISTING FUNDING OPTIONS FOR CASARA

Severed under section 69(1) of the AIA – Confidences of the Queen's Privy Council for Canada.

..... While the appropriateness of existing funding options is being reviewed by financial authorities within DND, the following observations are provided by the CRS Evaluation team:

- The Treasury Board Policy on Transfer Payments (1 June 2000), indicates the options for transfer payments are limited to three major types – grants, contributions and “other transfer payments”. The Financial Administration Manual¹ states that a ‘transfer payment’ is made by a Department when it furthers federal government policy and DND program objectives. As discussed in *Part 1 – CASARA Program Overview*, CASARA is qualified to be a recipient of a federal government transfer payment. The following assessment is presented of the transfer payment options as they apply to CASARA, as well as the option of contracting for CASARA services.
- **Grants:** These are unconditional payments made to a recipient who must meet eligibility and entitlement requirements at the time of payment. As grants are not subject to being accounted for or audited, other than meeting the ‘pre-conditions’ of the grant, departments have little control over their use. This option is not suitable for DND’s relationship with CASARA, as DND maintains a close relationship and degree of oversight of CASARA through its network of CASARA liaison officers, regular Unit evaluations, validation of training standards, influence on Unit locations, and the Departmental accountability for CASARA when tasked by the JRCCs.
- **Other Transfer Payments:** As defined in the Policy on Transfer Payments,² these payments are based on a legislative requirement or an arrangement whereby a formula or schedule is used to determine the expenditure amount. This arrangement allows a recipient to redistribute funds received if approved in the agreement. Due to the requirement for DND and the CASARA Liaison Officers to work closely with CASARA, this arrangement is not readily applicable.

¹ Financial Administration Manual Chapter 1016-1 Transfer Payments – 31 October 2003.

² Treasury Board of Canada Policy on Transfer Payments, 1 June 2000. Appendix A.



ANNEX D

- **Contributions:** Contributions are conditional payments whereby the recipient must meet eligibility requirements, account for the use of their funds, and meet performance and achievement goals. This method of payment is used when “the success of the program requires ongoing supervision and scrutiny of recipients.”³ Contributions provide “the highest level of control” for transfer payments. As discussed above, the requirement to ensure rigor in the training standards and qualifications of CASARA members and to ensure a certified level of SAR capability, a degree of scrutiny and supervision by DND is required. This method of transfer payment appears most applicable to funding CASARA.
- **Contracting for Services:** A further option to be considered would be contracting for the SAR capability and services provided by CASARA. While a detailed analysis of this option has not been conducted, an overview of several issues involved with contracting indicates it would not be an acceptable or practical funding alternative. The issues of contractor liability, costing of volunteer resources, sustainability of volunteer commitment, ensuring geographical distribution of CASARA assets in ‘low incident areas’, applying economic rather than effectiveness criteria for employing CASARA resources, and the additional regulatory framework imposed, would preclude the use of this option.

Conclusion: The current use of a Contribution Agreement to fund the SAR capability and services provided by CASARA appears to remain the most appropriate funding arrangement.

³ Ibid. Para 10. Contributions.



ANNEX E – GLOSSARY OF TERMS

1 Cdn Air Div	1 Canadian Air Division	MOU	Memorandum of Understanding
CA	Contribution Agreement	NCM	Non-Commissioned Member
CA	Contribution Agreement	NSP	National Search and Rescue Program
CARES	Civil Air Rescue Emergency Service	NSS	National Search and Rescue Secretariat
CAS	Chief of Air Staff	PLB	Personal Locator Beacon
CASARA	Civil Air Search and Rescue Association	RCMP	Royal Canadian Mounted Police
CF	Canadian Forces	SAR	Search and Rescue
CLO	CASARA Liaison Officer	TB	Treasury Board
D Air FE	Directorate of Air Force Employment	TC	Transport Canada
DASOR	Director Air Staff Operational Research		
DCDS	Deputy Chief of Defence Staff		
DND	Department of National Defence		
ELTs	Emergency Locator Transmitters		
ICSAR	Interdepartmental Committee on Search and Rescue		
JRCC	Joint Rescue Coordination Centre		
LMSAR	Lead Minister for Search and Rescue		

