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Assessment Agency

MILITARY FLYING ACTIVITIES IN LABRADOR AND QUEBEC

Report of the
Environmental
Assessment Panel

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ENVIRONMENTAL ASSESSMENT PANEL REVIEWING MILITARY FLYING ACTIVITIES IN LABRADORANDQUEBEC

The Honourable Sheila Copps
Deputy Prime Minister and
Minister of the Environment
House of Commons
Ottawa, Ontario

The Honourable David Collenette
Minister of National Defence
House of Commons
Ottawa, Ontario

Dear Ministers:

In accordance with the terms of reference issued in July, 1986, the environmental assessment panel has completed its review of military flying activities in Labrador and Quebec. On behalf of the panel, I have the honour to submit this report for your consideration.

Yours sincerely,

Alexander Davidson
Chairman

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SUMMARY

This report conveys the findings of a seven-person federal environmental assessment panel appointed to review military flying activities in Labrador and Quebec as proposed by the Department of National Defence (DND).

Approximately 6000-7000 low-level training flights are currently being conducted out of Canadian Forces Base (CFB) Goose Bay, over designated areas of Labrador and Quebec that total about 100 000 km^2. This training is being carried out under a Multinational Memorandum of Understanding (MMOU), signed by Canada and NATO Allies, that expires in 1996. DND proposes to negotiate a new MMOU that would provide for an increase in the number of aircraft, an increase in training flights to a maximum of 18 000, an extension of the flying season, an additional practice target area of 300 km^2 and a change to the designated flying areas. Of the 18 000 proposed flights, a maximum of 15 000 would be at low level, below 1000 feet. DND estimates that 90% of those would likely be at 500 feet or below, and approximately 15% would operate as low as 100 feet above ground level.

DND has put forth two mitigative options. Option “A” involves the continuation of flight training within the two existing training areas of 100 000 km^2, with reduced avoidance for both humans and sensitive wildlife species. Option "B" modifies and adds to the current training areas to provide 130 000 km^2, of which no more than 100 000 km^2 would be used for training at any one time, while maintaining the current avoidance criteria. DND prefers Option "B," as it feels that this option will provide a higher level of environmental protection while at the same time ensuring the viability of the training program.

The environmental assessment panel was given the mandate to examine the environmental, social and economic effects of the existing and proposed training activities and to make recommendations accordingly. Following its appointment in 1986, the panel held many public consultations at various stages of the review and received considerable information from DND and review participants. The public hearings held in 14 communities in Labrador and Quebec in September and October 1994 were the most recent consultations. All written and oral information received by the panel since its appointment was considered in the preparation of this report.

This has been a special kind of environmental assessment, in that the Project has been ongoing for many years and impacts more than 100 000 km^2 of land in Labrador and Quebec that, until recent times, had been used mainly by aboriginal people. The Project entails no extraction of products from the land and little alteration of the physical landscape. Impacts on the land are mainly from noise and associated startle effects from low-flying aircraft. This is not a hypothetical project. It is a real industry with real employees and dependents.

The Project and the review have been the source of controversy, division and social tension. This is the aspect of the Project that is best known across Canada. Groups and individuals who benefit either directly or indirectly from the Project hold views on the future of the Project that are greatly divergent from those of people who do not benefit. The panel was struck by the difference in evidence between those who benefit from the Project, both aboriginal and non-aboriginal, who harvest from the land and who said that the Project had little adverse effect on them; and those who do not benefit from it and who claim that the overflights have significant adverse effects. The Project is critically important to the livelihood of some, yet it is a source of disruption and annoyance for others.

Since the completion of the public hearings, the panel has carefully weighed the benefits of the Project against its adverse impacts. In doing so, the panel has considered the need to make recommendations that not only will ensure minimal impact to the human and natural environment, but also might help bridge the social and cultural polarization that now exists in the region.

The panel also examined the issue of aboriginal land claims. The panel believes that settlement of land claims in the Project area will constitute significant bridge building. The failure to settle land claims affects the attitude of some aboriginal groups towards the Project. The panel has recommended that, given the perception of the aboriginal groups that the Project negatively influences their land claims negotiations, the federal and provincial governments settle aboriginal land claims in the Project area quickly.

The benefits of the Project were made clear to the panel. The Project supports the town of Happy Valley-Goose Bay, with a population of about 8600 people, and central Labrador in general. The panel was told that Happy Valley-Goose Bay is a one-industry town for

which no viable economic alternative currently exists and that the end of low-level flying would result in the closure of CFB Goose Bay and an economic disaster for the town. Many people told the panel that the continuation of low-level flying was vital to the economic and social health of the town of Happy Valley-Goose Bay and to the region. Hundreds of families and businesses have built a prosperous and satisfying lifestyle over the years, based on employment and income from military flying activities. Although widespread support for the Project was evident in Happy Valley-Goose Bay and some other communities, many people gave their support on the condition that the natural environment of the region remain healthy, productive and protected.

The social, health and environmental impacts of the Project are not as clear to the panel as the economic impacts. The panel found that the scientific basis for predicting the effects of the Project on wildlife, natural systems and human health is weak in many areas. Despite more than 14 years of military low-level flying, there are few sound data on the effects of low-level flying on human health, on wildlife or on the environment in general. That state of ignorance should not be allowed to continue.

With respect to the social impacts of the Project, the panel examined both in-town impacts and those occurring on the land. In terms of the former, the panel concluded that those impacts related to infrastructure and services, housing, base-region relations and general social problems can be addressed as outlined in the panel's recommendations in this report.

Impacts on land use are an issue of critical importance, but the panel did not receive conclusive evidence with respect to the magnitude of the impacts. In light of the non-participation of some of the aboriginal groups during the hearings, the panel was forced to rely on written information provided by those groups prior to the hearings. That information indicated that adverse impacts on aboriginal use of the land have been caused by low-level flying. This information was useful: however, the panel was not able to explore this issue with those groups to the extent it would have desired. At the hearings, the panel was told that aircraft noise might discourage aboriginal people from using the land — a very important consideration, for harvest is vital for many economic, social and cultural reasons. However, the panel received no evidence that hunting, fishing or trapping has decreased by reason of low-level flying. Indeed, some participants indicated that these activities seem to have increased in the past few years.

The panel also heard from both aboriginal and non-aboriginal people who harvest from the land and who indicated that they saw no adverse effects from low-level flying. The panel has concluded that there is a need for further studies to determine the actual levels of resource harvesting on the land and the impacts of low-level flying on that harvesting.

The panel examined a number of potential impacts of low-level flying on human health, including those related to fuel management, air quality and hazardous waste management. The panel believes that measures being undertaken by DND, in addition to the recommendations in this report, will satisfactorily address these issues.

The panel received considerable input from experts who raised largely hypothetical and often contradictory concerns about the possible health impacts of aircraft noise. Much testimony was received from residents who said that they were not bothered by noise in the vicinity of the airport. Nevertheless, the panel has identified a number of issues and made recommendations concerning the effects of noise in the school environment in Spruce Park, the disruption of activities such as sleeping and the overall annoyance effects of noise. With much contradictory evidence at hand, uncertainty remains, and further monitoring and study are needed.

With respect to environmental issues, it became very clear to the panel during the review that the principal environmental issue associated with the Project was aircraft noise. The panel looked at the effects of noise from aircraft on wildlife, the effects of night flying, the effects of flying in river valleys and the effects of pollution from the flights. In general, the panel was not presented with information that pointed towards significant adverse impacts in any of these areas. In many areas, however, the panel has concluded that baseline studies are required to allow for constructive monitoring.

The panel also paid special attention to the effects of the Project on caribou, which are one of the area's most important resources. The panel has made several recommendations on this topic, the most significant of which is for a joint Canada/Quebec/Labrador caribou management board for the George River caribou herd.

DND's proposed mitigation to lessen or reduce impacts is through an avoidance program. Avoidance refers to the closure of parts of the training area to low-level flying to protect wildlife and people from low-level overflight and startle. Despite an obvious dedication of

money and effort by DND to the avoidance program, the panel concluded that there are many uncertainties regarding its effectiveness. With the exception of quite good data on caribou, there is little information on the natural systems or wildlife in the training areas. In addition, there are almost no cause-and-effect research studies on the impacts of low-level flying in the region. So little is known about much of the wildlife in the training areas and the effects of overflights on them over the longer term that much uncertainty, and hence concern, remains. As a result, the panel could not draw conclusions on the longer-term effects of low-level flying on the natural systems. The panel is not convinced that the avoidance program at present is successful in meeting its objectives.

The panel heard some groups indicate that, despite DND's best efforts, it was difficult for them to have full trust in the avoidance program, given that DND was also running the flying program. In consideration of the questionable success and credibility of the avoidance program, the case for a different approach became clear. The need for independent co-ordination of monitoring and research to feed into the avoidance program also became evident.

The panel acknowledges that, considering the apparent scientific uncertainty with respect to the environmental and health effects of the Project, the uncertainties associated with the avoidance program, the social tension and polarization caused by the Project and the strong opposition to the Project by important aboriginal groups, a first reaction might be that the Project should not proceed.

The panel has assessed the benefits of the Project against the above factors. The panel has concluded that, in the short term, severe negative economic effects would result from Project termination, and there is little evidence at this time to suggest that the Project will cause significant negative environmental, social or health impacts. The panel also believes that, in the short term, Project termination might create more social tension, rather than lessen it.

However, the panel has also concluded that there is still a high level of uncertainty with respect to the effects of low-level flying, and that, in the longer term, an independent organization is needed to co-ordinate monitoring and research efforts aimed at resolving some of this uncertainty. The panel believes that the best course of action is to proceed with the Project while taking all steps necessary to ensure protection of the environment and human health and to build bridges of equal participation and trust in an effort to reduce existing social tension.

The panel therefore recommends that the Project be approved, subject to the recommendations in this report. An absolute condition is the establishment of the Labrador Institute for Environmental Monitoring and Research, whose function would be to advise on the terms and conditions governing low-level flying with respect to avoidance criteria, mitigative measures, research, effects monitoring, compliance auditing, boundaries of the low-level training area and Project-related land uses in the training area. The Institute must be established prior to the signing of a new MMOU.

Affected aboriginal groups in Labrador and Quebec must be equal partners in the Institute. This will remove DND from its dominant role with respect to the management of monitoring, mitigation and research. The creation of the Institute will leave the bulk of the responsibility for these important areas to other, more appropriate interested users and government agencies.

DND should not carry the full load for the financing of the Institute. The panel recognizes that DND and NATO Allies have set aside substantial funds for monitoring, mitigation and research. The panel believes that these existing funds should be targeted for the Institute and that other federal and provincial agencies should redirect some of their present research and resource management funds to the work of the Institute. These redirected funds should at least match contributions made by the Allied countries. With skilful financing, there need be no additional cost to government. It is expected that the Institute will also seek funds from research granting agencies, foundations and other private sources.

It would be unacceptable to approve the Project without a sound supporting program of monitoring and research. The proponent and many participants called for that. However, it would be equally unacceptable, even foolish, not to design and manage that monitoring and research program in a way that takes full advantage of all available experience and insights and that at the same time builds trust, credibility and acceptance for the Project. In brief, it would be wrong to approve the Project without the institution that will help make it viable.

The panel is convinced that the minimum price to pay for project approval is a package of mutually supporting measures aimed at reconciling two objectives — protecting the environment and human land use, and maintaining a viable flight training program — while at the same time reducing the alienation of many aboriginal people from the Project and the conflict between groups in the region. The package consists of:

- a commitment to early settlement of native land claims;
- the establishment of the Labrador Institute for Environmental Monitoring and Research; and
- the setting up of a joint caribou management board for the George River caribou herd.

With respect to the recommended option for training areas, the panel believes that a flexible approach must be adopted. The panel has recommended that the Option "B" configuration with flexible boundaries be accepted as the preferred option for renegotiation of the MMOU in 1996. The panel believes that what is essential in adopting a flexible approach to airspace allocation is public input into and understanding of the rationale behind airspace management decisions that are taken on a month-bv-month or seasonal basis. The panel has recommended that this is a task for the proposed Institute.

The panel has made 58 specific recommendations throughout the report; these are listed together in Chapter 12.

1 .O INTRODUCTION

1.1 The Project

In 1986, the Associate Minister of National Defence referred the low-level flight training activities in the Quebec-Labrador peninsula and the proposed NATO Tactical Fighter Weapons Training Centre at Canadian Forces Base (CFB) Goose Bay Labrador to review by a federal environmental assessment panel. In 1991, the Tactical Fighter Weapons Training Centre was cancelled and the low-level flying activities became the main subject of the environmental review.

1 .1.1 Current Project

Low-level activities are currently taking place under the authority of a Multinational Memorandum of Understanding (MMOU) signed by Canada and other NATO countries — namely the United Kingdom, the Netherlands, Germany and the United States, who withdrew from the agreement in 1991. To a limited extent, the Canadian Forces also train out of Goose Bay. Lately, the Allies have been making 6000-7000 low-level sorties annually and training for about 28-31 weeks each year.

Low-level flight training involves navigating and manoeuvring while flying below 1000 feet above ground level (AGL). The current MMOU permits low-level flights within two designated areas in the Quebec-Labrador peninsula that total about 100 000 km^2 (Figure 1). Pilots are permitted to fly as low as 100 feet above all obstacles within the designated flying areas. Two airspace corridors link Goose Bay with the northern and southern low-level training areas (LLTA-1 and LLTA-2, respectively), and a further two corridors link the training areas and allow aircraft to transit between them. Pilots are permitted to fly as low as 250 feet above obstacles within the training corridors.

The training also involves simulating attacks either by photographing mock ground targets made of plywood ("camera targets") that are located throughout the low-level flying areas or by practising weapons delivery. The southern training area contains a practice target area (PTA) — an area 8 nautical miles (NM) in diameter, where pilots practise attacks by releasing inert, non-explosive weapons against designated ground targets.

In general, the Project entails no extraction of products from the land and little alteration of the physical landscape.

1 .1.2 Proposed Project

The current MMOU expires in 1996. Under the proposed project, the proponent (the Department of National Defence, DND), along with the MMOU signatories, would like to increase user nation aircraft deployed at Goose Bay to a maximum of 119, increase sorties or flight training missions to 18 000 annually and increase the length of the flying season to a maximum of 36 weeks per user nation (over a 39-week period). Night flights are to increase from about 50 to a maximum of 1400. Up to 30 of the camera targets are to be made infrared significant for use during night flying. Plans also call for an additional PTA northwest of Goose Bay (covering about 300 km^2) and the use of forward-firing inert ordnance and threat emitters in the PTA.

In terms of the training areas, DND has put forth two options for mitigation that it feels will allow low-level training activities to continue while protecting the environment and maintaining the operational viability of the Project. Option "A" involves the continuation of flight training within the two existing training areas of 100 000 km^2, with reduced avoidance for both humans and sensitive wildlife species. Option "B" modifies and adds to the current training areas to provide 130 000 km^2, of which no more than 100 000 km^2 would be used for training at any one time, while maintaining the present avoidance (Figure 2). DND prefers Option "B," because it believes that it will provide a higher level of environmental protection while at the same time ensuring the viability of the training program.

1.2 The Environmental Assessment Review Panel

In July 1986, the federal Minister of the Environment announced the appointment of a seven-person environmental assessment panel to conduct a public review of the current and proposed military flying activities in Labrador and Quebec. The composition of the panel changed over the course of the review. Biographies of the current panel members and the names of, and terms served by, previous panel members are included as Appendix A. The review was conducted under the federal Environmental Assessment and Review Process (EARP) Guidelines Order.

1.3 The Review Process

The panel was to examine the low-level flight training being carried out in accordance with bilateral agreements with NATO Allies, as well as a proposal to establish an integrated Tactical Fighter Weapons Training Centre for training NATO air forces. The proposed centre required airport and infrastructure expansion, the building of training facilities at Goose Bay and the development of tactical weapons ranges in Labrador.

In its review, the panel was mandated to consider the impacts of the NATO training centre and current and proposed military training activities on the natural environment; the effect of low-flying aircraft on public health; and the socio-economic effects of the proposal on communities and on hunting, fishing and trapping as well as outfitting within the flight training areas.

With respect to the NATO training centre, the panel was asked to recommend whether or not the centre should proceed. This portion of the Project was cancelled and removed from consideration in 1991.

The panel was asked to recommend measures to minimize adverse impacts of current and proposed low-level flight training. In 1987, the panel sought clarification from the Minister of the Environment on this aspect of its mandate. The panel

Figure 1 - Location of Key Communities in the Quebec-Labrador Peninsula and Current Low-Level Training Areas

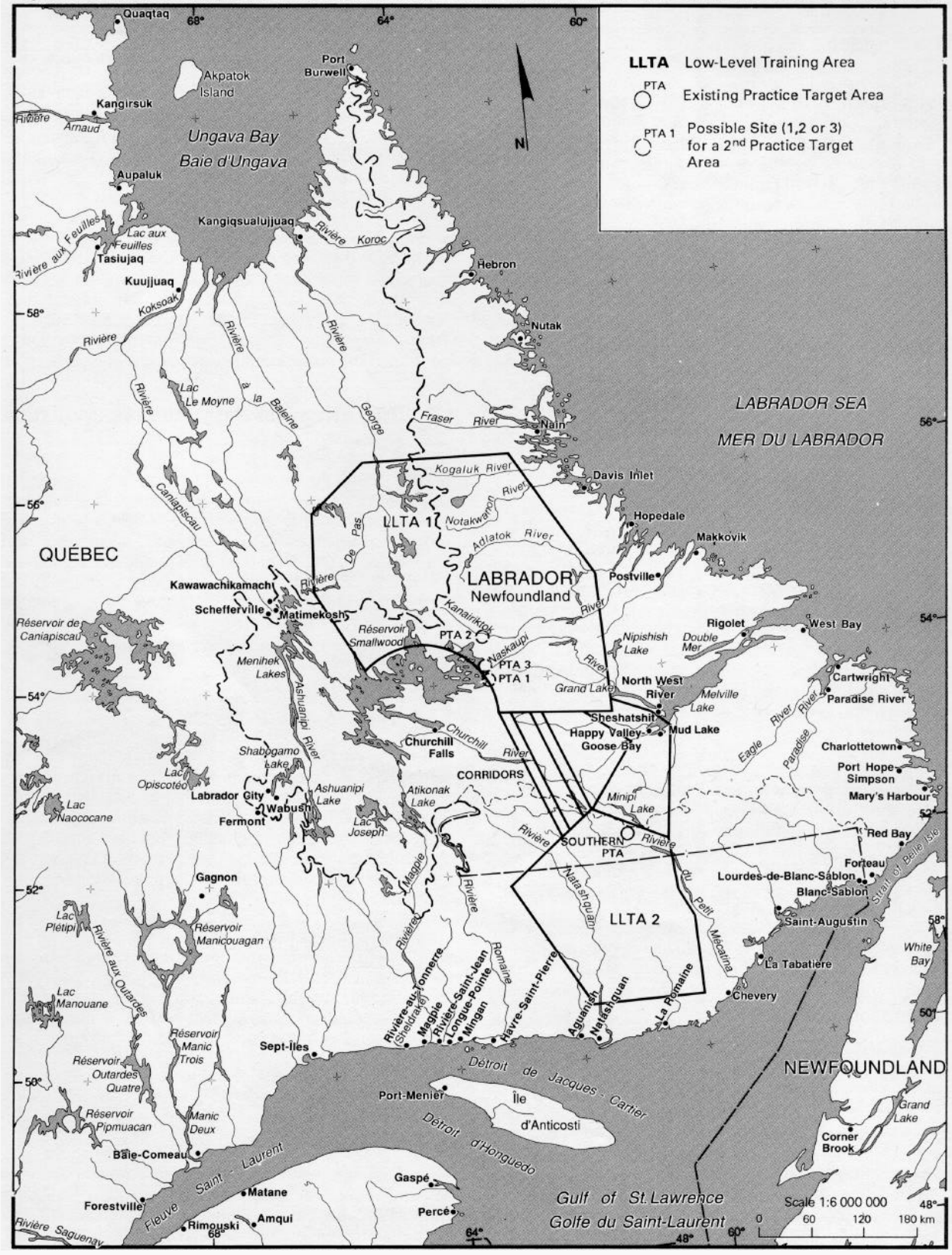
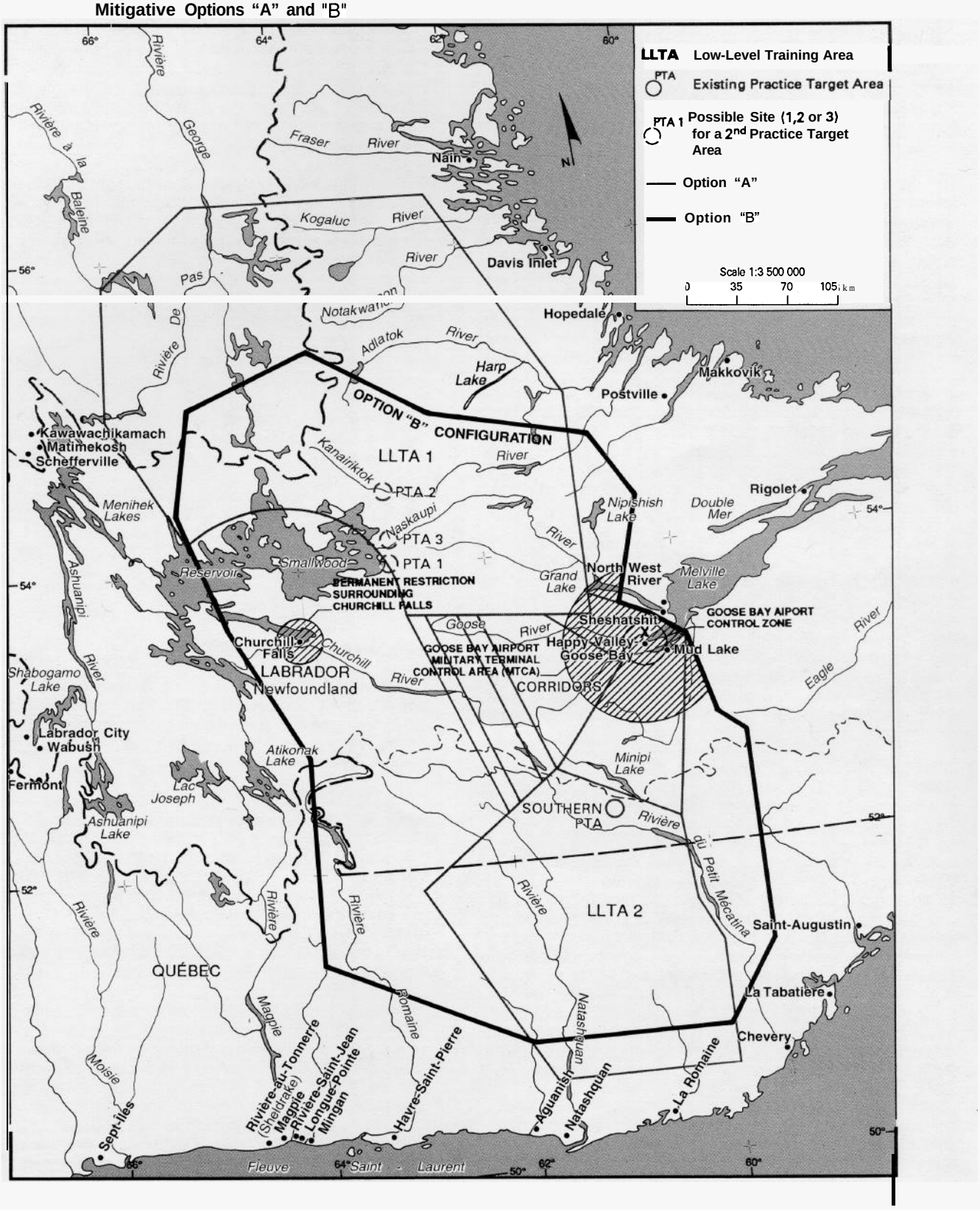


Figure 2- Study Area Showing the Low-Level Training Areas Under Mitigative Options "A" and "B"



wanted to know if it had the mandate to recommend the termination or phasing out of current and anticipated flight training. The Minister of the Environment, in a letter dated March 21, 1988, directed the panel to "follow its collective conscience," indicating that "what you [the panel] write in your report is for you to decide." At the same time, the Minister requested the panel to take into full account the government's commitment to its NATO Allies with respect to flying activities at Goose Bay.

The panel issued Draft Guidelines for the preparation of an Environmental Impact Statement (EIS) and Operational Procedures for Public Review in August 1986. From September to November of that year, the panel held public meetings in Wabush, Goose Bay, Cartwright, Mary's Harbour, Forteau, Sheshatshit, North West River, Kuujjuaq, Kangiqsualujjuaq, Nain, Rigolet, St. John's, Utshimassit (Davis Inlet), Makkovik, Hull, Montreal and Schefferville to receive comments on the Draft Guidelines. Based on these comments, Final Guidelines for the preparation of an EIS were issued in January 1987.

In October 1989, an EIS was submitted by DND, and a 90-day review period began. The panel reviewed the EIS and submissions received from the public, government representatives and the panel's technical specialists (listed in Appendix B). The panel identified 38 major information deficiencies that needed to be addressed before it could proceed with public hearings.

In May 1990, NATO Ministers cancelled plans for a training centre at Goose Bay. Later, in December, a letter from the Minister of Defence to the Minister of the Environment requested that the panel's Terms of Reference be changed to reflect the cancellation of the training centre. The Minister of Defence also requested that the deficiency statement of the panel be modified to reflect this change. Ongoing and proposed low-level flying activities became the subject of the review. A complete description of the panel's Terms of Reference and supplementary clarification are included as Appendix C.

In December 1992. the panel issued a revised deficiency statement to DND in which it withdrew 9 deficiencies and modified 15 of the remaining 29 deficiencies. The revised deficiency statement was made public on January 9, 1992.

In April 1994, the panel received the revised EIS from DND. A 90-day public review then began to determine if the EIS was an acceptable document with which to proceed to the final public hearing phase of the review. The panel reviewed the revised EIS and the more than 850 submissions received from the public, government representatives and the panel's technical specialists. The panel determined that some of the questions had not been fully addressed. Having received assurance from DND that part of the additional information would be provided by September 12, 1994, and that the remainder of the additional information would be provided by October 11, 1994. the panel decided that it could proceed with public hearings

The public hearings gave review participants an opportunity to present their views, opinions and technical information on the acceptability of the proposal. Public hearings were conducted from September 19 through to October 29, 1994, in Happy Valley-Goose Bay, Labrador City, Schefferville, Sept-Iles, Natashquan, La Romaine, St. Augustin, Nain, North West River, Hopedale, Makkovik, Kuujjuaq, Churchill Falls and Cartwright. During the hearings, there were over 200 oral presentations. Appendix D provides the specific dates and locations of the hearings, as well as a list of presenters at each session. The panel received more than 200 written submissions during this phase.

To assist the public in its review, participant funding was made available in three phases. An independent committee, distinct from the panel, made recommendations on the awarding of the funds under the participant funding program. Phase I funding was provided in February 1988 to support public participation in the environmental assessment review. Eight of the 14 applicants received funding totalling $140 000. Phase II funding was provided in October 1989 to assist participants in the review of the EIS and in presenting their views to the panel. For Phase II of the review, 15 of the 17 applicants were awarded a total of $318 130. Phase III funding was provided in January 1994 to assist participants in reviewing the revised EIS and presenting their views at the final public hearings. For this final phase of the review, $300 000 was awarded to 10 of 31 applicants.

Following the public hearings, the panel prepared this report, which has been submitted to the federal Minister of the Environment and Minister of National Defence.

A list of abbreviations used in this report is found in Appendix E.

1.4 Project Justification

Concerns were expressed during the process that DND has not effectively established justification for the Project. It was felt by some review participants that since the "Cold War" has ended, there is no further need for the continuation or expansion of low-level flight training.

DND indicated that the Project maintains links with NATO Allies, which is especially important at a time when Canada is closing military bases in Europe. Through the Project, the operational readiness of Allied air forces and Canadian Forces to support multinational or UN security resolutions is enhanced. Both NATO and the UN have expressed the need to retain a capability to respond to increasing global violence and instability. This was demonstrated during the Persian Gulf War, when air crews that had trained at Goose Bay played a significant role in the Allied operations.

The end of the Cold War has not signified the end of conflict among nations or altered each country's responsibility to provide for its defence and collective security needs. DND indicated that tactical air training has become even more critical with the advent of modern air defence systems that are increasingly available to more and more nations.

The panel also heard that opportunities for realistic training alternatives are limited, especially in Europe, where air traffic

congestion and the prevalence of many human-made obstructions have limited low-level training. Furthermore, the fact remains that those Allies present in Goose Bay are there of their own volition and for their own national reasons, and they have made it clear that they wish to remain.

The panel recognizes that its mandate does not allow it to examine national defence policy, but it notes that the need and justification for a project are a standard component of environmental assessments. Although it was somewhat restricted by its mandate, the panel examined all information received on this issue and does not believe that it has sufficient evidence to challenge the justification put forth by DND.

1.5 Project History and Setting

Goose Bay has been an important military installation since its development in 1941 as a staging base to Europe and for operations in the North Atlantic. During the mid- to late 1950s, the United States Air Force further developed the installation to support Strategic Air Command operations and to provide an air defence base in support of NORAD.

Late in the 1950s, the Royal Air Force established a detachment at Goose Bay to support flights to the Pacific and testing in that area. It was during this period that Goose Bay began to be used by the Royal Air Force for low-level training with the Vulcan aircraft. Vulcan aircraft flew to Goose Bay from main bases in the United Kingdom to conduct training using various flight profiles for missions. The low-level portion of the mission was carried out on routes approved by Canada but usually quite a distance from Goose Bay, in northern Quebec and Labrador.

Through the 1960s and 1970s, the number of these aircraft at Goose Bay at any one time was in the order of three or four. The Vulcan aircraft was withdrawn from service in the early 1980s. and the Tornado was introduced as the main aircraft used by the Royal Air Force for low-level operations. Beginning in 1980, NORAD low-level exercises were conducted annually in essentially the same airspace that is now being used by the Allies, using aircraft of the United States Air Force and the Canadian Forces. Also at this time, the Germans started training at Goose Bay. This was the beginning of the project known today as low-level flying.

Military flying activities are currently conducted in a 100 000 km^2 area located on the Quebec-Labrador peninsula (see Figure 1). The area supports a diversity of wildlife, including several caribou herds, moose and many species of furbearers and birds.

The George River caribou herd is the largest herd in the area, with a population of 600 000 or more. Caribou is of spiritual, cultural and economic importance in the region and is a mainstay of both aboriginal and non-aboriginal diets. Furbearers support a significant trapping industry in Labrador and Quebec. The rivers lakes and streams of the area provide habitat for several species of fish, including salmon and Arctic charr. Up to 29 species of waterfowl are found in the Project area.

The Quebec-Labrador peninsula is the home of approximately 50 000 people, of which 60% live in Labrador. The population consists of several aboriginal groups, descendants of early European settlers and people who have moved from other parts of Canada and other countries.

The people of the Quebec-Labrador peninsula are involved in either the wage sector or the non-wage sector, or a combination of both. Wage sector activities include employment in support of military flying activities out of Goose Bay, hydroelectricity, mining, forestry, government administration and the fishery. Non-wage sector activities include trapping, hunting, fishing and berry picking.

The town of Happy Valley-Goose Bay, with CFB Goose Bay, has a population of approximately 8600 people, which constitutes almost 30% of Labrador's population. Many people have indicated that the direct employment and indirect economic spinoffs resulting from military flying activities out of CFB Goose Bay play a crucial role in the survival of Happy Valley-Goose Bay and in the prosperity of central Labrador directly, and of the rest of Labrador indirectly.

There are six aboriginal groups in the Project area. In northern Quebec, the Inuit communities of Kuujjuaq and Kangiqsualujjuaq support about 2000 residents. The Montagnais of Quebec (estimated in the revised EIS as numbering 4000) reside in several Lower North Shore communities and in Matimekosh, near Schefferville. Over 400 Naskapi live in Kawawachikamach, also near Schefferville.

In Labrador, the Innu Nation represents the Innu of Sheshatshit and Utshimassit, with a combined population estimated at over 1200. The Inuit of Labrador, represented by the Labrador Inuit Association (LIA), reside in northern coastal communities and in the Lake Melville area (Happy Valley-Goose Bay, North West River, Mud Lake). The revised EIS estimates that approximately 5000 Inuit reside in these communities. The Labrador Métis Association represents the last aboriginal group in the area and has a membership of over 1500.

Although the panel heard that the Project is crucial to the economic well-being of Happy Valley-Goose Bay and central Labrador, it also learned that the majority of the aboriginal groups do not appear to benefit either directly or indirectly from the Project. Most of the aboriginal groups have stated that the Project adversely affects them.

Of the six aboriginal groups mentioned above, only two (Inuit of Quebec, Naskapi of Quebec) have had their land claims resolved. With respect to some of the four groups with unresolved land claims, there appears to be a feeling of frustration and an inability to participate in the environmental review process from the same position of strength as can groups whose claims are settled. The business sector in the area also appears to be frustrated in this regard, feeling that development in the area is "on hold" until land claims are settled. These are some of the factors that cause the ongoing military flying activities and the proposed increase in military flights to be a source of division, conflict and social tension.

1.6 Participants in the Review

Throughout the course of the review, the panel benefited from a high level of participation by many groups and individuals with diverse interests. A brief sketch of the representation follows. Summaries of the views expressed by participants are found in each of the relevant chapters of this report.

In Nunavik (northern Quebec), Inuit and non-aboriginal residents of Kuujjuaq and Kangiqsualujjuaq and local and regional governments were active in the review. At the public hearings. many residents expressed their views to the panel. The panel also received a joint submission from the Kativik Regional Government, Makivik Corporation and the Town of Kuujjuaq.

In the Scheffervrlle region of Quebec, participation in the review was by non-aboriginal hunters and trappers in the region and by Montagnais of Matimekosh and Naskapi of Kawawachikamach. Montagnais and Naskapi people of the region did not participate in the public hearings, as discussed below.

On the Lower North Shore of Quebec, participation included that by Montagnais people of the communities represented by the Conseil des Atikamekw et des Montagnais (CAM). The CAM produced several detailed submissions on the adequacy of information provided by DND but did not participate in the public hearings. The panel also received many written submissions on the revised EIS from non-aboriginal residents of the Lower North Shore.

Participation in Happy Valley-Goose Bay, North West River and Mud Lake was very high throughout the review. Municipal governments, interested residents, business organizations and local groups made numerous submissions to the panel at several different stages in the review process. There were particularly high levels of participation in the later stages of the review process, namely the review of the revised EIS and the public hearings.

The Innu of Sheshatshit and Utshimassit were active in the review process from 1986 until the announcement of the public hearings, after which they did not participate. The panel received many extensive written submissions from the Innu Nation prior to the hearings.

In western Labrador, the communities of Labrador City and Wabush maintained a continued interest in the review and made both written and oral representations to the panel. Towards the end of the review, residents of Churchill Falls became more involved owing to proposed changes to the training areas outlined in the revised EIS.

On the north coast of Labrador and elsewhere, the LIA was a very active participant throughout the review process. As the review progressed, the LIA developed many concerns over the review process. such as its ability to deal with land claims issues and aboriginal rights. The LIA reluctantly participated in the public hearings but nevertheless made many constructive submissions to the panel. Non-aboriginal residents of northern Labrador showed a moderate interest throughout the review. The level of interest in the review process shown by communities of southern Labrador declined with the removal of the proposal for the NATO training centre.

Several federal government departments and the Governments of Newfoundland and Labrador and of Quebec participated in the review process. Representatives of the Province of Quebec did not make a presentation at the public hearings. Health Canada, the Department of Indian Affairs and Northern Development, Environment Canada, Enterprise Newfoundland and Labrador, Newfoundland and Labrador Native Policy Branch and Newfoundland and Labrador Wildlife Division made presentations at the public hearings.

In addition, several individuals and organizations across the country made written submissions to the panel.

1.7 The Non-Participation of Some Groups During the Public Hearings

As indicated above, several important groups chose not to participate in the public hearings.

Shortly after the hearings schedule was announced, the CAM, the Innu Nation and the Naskapi Band of Quebec wrote to the panel, indicating that several conditions would have to be met to secure their participation in the hearings. These included:

- requiring DND to provide Information in 36 areas that the groups felt was essential to allow for discussion at hearings, including information on the impact of the Project on aboriginal rights and the process of land claims negotiation;
- modifying the hearings procedures to allow for cross-examination;
- revisiting the timing of the hearings in Utshimassit and Sheshatshit and the scheduling of additional meetings in larger centres; and
- providing more time for technical sessions of the hearings.

The panel responded to the three groups as follows, making efforts to address the concerns to the extent possible within the framework of the federal environmental assessment review process:

- Based on the commitment made by DND to provide certain additional information, there was enough information to have meaningful discussion at hearings. Scheduling hearings, where extensive and open discussion could take place, was felt by the panel to be the most useful way to proceed.
- The panel followed the requirements of the federal process, which directs that hearings be held in a non-judicial and informal manner.
- The panel offered to work with the groups in an effort to find mutually agreeable dates and durations of hearings in Sheshatshit and Utshimassit. The panel offered to consider additional locations if the groups confirmed their intent to participate.

- The panel offered to extend the technical sessions to give the three groups additional time for presentations and questioning.

After reviewing the panel's response to their concerns, the CAM, Innu Nation and Naskapi Band of Quebec announced that they would not be participating in the hearings. Several national and local groups showed their solidarity by also withdrawing from the public hearings.

It is unfortunate that the three aboriginal groups chose not to participate in the public hearings. The hearings would have benefited substantially from the active participation of these groups, and the panel believes that the groups would have also benefited from the opportunity to present their information and ask questions of DND.

These groups represented people who were potentially affected by the Project but would derive few or no direct benefits from the Project. As a result, participation at the hearings was weighted in favour of groups and individuals who derived direct benefits from the Project. The panel is cognizant of this imbalance.

Prior to the hearings, the panel received many comprehensive written submissions from the CAM, Innu Nation and Naskapi Band of Quebec. The panel used this written material to develop questions at the public hearings and in preparing this report.

2.0 BUILDING BRIDGES

2.1 Introduction

The Project under consideration is a source of much controversy and division. It provides obvious direct economic benefits in central and western Labrador and indirect benefits to a much broader area. Yet there are many groups and individuals who claim that not only does the Project not benefit them, it actually adversely affects them.

The panel has carefully evaluated all the information it has read and heard since the beginning of the review. The panel's examination has included a consideration of the various impacts of the Project: economic, environmental, social and health as well as those on caribou and other wildlife. It also dealt with measures for mitigation, avoidance and monitoring. Conclusions and recommendations on these areas are contained throughout this report.

The panel has concluded that, in the short term, severe negative economic effects would result from project termination. In addition, there is little evidence at this time to suggest that the Project will cause significant negative environmental, social or health impacts. However, the panel has also concluded that there is still a high level of uncertainty with respect to many aspects of the effects of low-level flying and that, in the longer term, an independent organization is needed to co-ordinate monitoring and research efforts aimed at resolving some of this uncertainty.

1. **The panel recommends that the federal government approve proposed military flying activities in Labrador and Quebec subject to the recommendations in this report.**

DND has made genuine efforts to build relationships of trust with the various aboriginal groups in Labrador and Quebec. Unfortunately, the results have often been disappointing. Some of the aboriginal groups did not respond positively to DND's efforts to involve them in the preparation of the revised EIS. Some groups felt that their suggestions on refinements to avoidance criteria were not accepted because DND was revising the criteria on the basis of operational and political considerations, not scientific ones. This lack of trust, combined with process-related concerns, resulted in the refusal of some aboriginal groups to participate in the hearings.

One aboriginal group, the LIA, signed a Memorandum of Understanding (MOU) with DND that sets out arrangements intended to prevent and, where necessary, monitor and mitigate impacts of low-level flying on the environment, wildlife and Inuit people of northern Labrador; and to provide for meaningful participation of the Inuit of Labrador in monitoring and mitigative measures and other activities undertaken pursuant to the MOU. The LIA participated fully in the review process and made a very valuable contribution to the public hearings. However, the LIA made it clear that, notwithstanding its MOU with DND, it did not feel it was being treated as an equal partner and it resented being perceived merely as an "ordinary stakeholder." It stated that it wanted recognition as an aboriginal group with special rights and with traditional ecological knowledge and experience to contribute to the process of environmental protection. It gave evidence of its willingness to "accommodate" the DND program given certain assurances of involvement.

The panel heard that many, perhaps most, attempts by DND to communicate with aboriginal groups about the Project were not successful. A credibility gap developed, and it needs to be bridged.

2.2 Public Involvement in the Integration of Monitoring, Mitigation and Research

The Labrador Métis Association said that it supported low-level flying, but only with strict environmental restraints and control measures to overcome any detrimental effects on the human, physical and biological components involved. Among those supporting the Project, not one person said that the Project should proceed at a cost to the environment. A balanced approach was invariably recommended given the general and genuine concern that exists about preserving the environment.

In their written submissions to the panel during the 90-day review period, other native groups such as the CAM, Naskapi of Kawawachikamach and Innu of Labrador flatly opposed the Project but did deal with some aspects of mitigation and monitoring.

It was a widely held view at the public hearings that more work is needed to determine what needs to be monitored, what refinements should be made to the avoidance program and what should be the subject of research.

The panel received much information suggesting that monitoring, mitigation and research must all be part of one comprehensive program that has the active involvement of key groups and individuals.

There was some agreement at the hearings about moving beyond the concept of avoidance monitoring to include effects monitoring. Although there was no overall agreement on the priority to be given to each of the 21 proposed studies listed in the EIS, there was consensus that both the monitoring program and the surveys carried out as part of the avoidance program should be melded into a single program of mitigation and monitoring.

Participants in the review process told the panel that the acceptance of refinements to the avoidance criteria, the need for them and the trade-offs that result will depend on how groups are involved in the process. They stated that as long as they are isolated from full participation in the discussions, they will not have confidence in how the criteria are determined. They stated that the trade-offs must be done in an open, fair process in order to be credible. A wide diversity of groups and organizations expressed interest in taking an active part in a committee to oversee and assess future monitoring and mitigation efforts.

At the public hearings, DND advocated the formation of a steering committee, advisory to DND, that would be all-inclusive in its membership and would address issues related to the mitigation and monitoring aspects of low-level flying, including evaluation and, if necessary, amendments to the boundary of the low-level training area.

The Government of Newfoundland and Labrador recommended to the panel that interested local groups and organizations be involved in the overview and assessment of future monitoring and mitigation efforts and commented that the review committee proposed by DND represented a reasonable effort to involve the public in this process. The Government of Newfoundland and Labrador offered support and assistance in the development of a rigorous monitoring and mitigation program of environmental and human avoidance.

The LIA also presented an approach for the successful management of low-level flying activities and related research. Similarities existed between the two approaches. However, the LIA's approach stressed the need for all groups to be equal partners in the management process.

After considering the vast amount of constructive input on monitoring, mitigation and research, the panel believes that there is a need to go beyond the idea of a steering committee as recommended by DND, in order to give the monitoring and research body the necessary independence from DND and the management flexibility essential to make decisions. The panel also believes that action must be taken as soon as possible, in light of the importance of the guidance required.

2. **The panel recommends the establishment of the Labrador Institute for Environmental Monitoring and Research, whose function would be to advise on the terms and conditions governing low-level flying, including avoidance criteria, mitigative measures, boundaries of the low-level training area and Project-related land uses in the training area. The Institute will manage a program of research and monitoring in support of this advisory role. The Institute must be established prior to the signing of a new MMOU.**

The panel wishes to make clear that the foregoing recommendation is an absolute condition for the approval of the Project.

The structural changes inherent in the establishment of an independent institute as described in this report will cast DND in a new, less dominant role with respect to the development and management of monitoring, mitigation and research. It will allow DND more time to manage the flight training program and will leave the bulk of the responsibility for monitoring, mitigation and environmental research to other, more appropriate Interested users and government agencies. A detailed description of the Institute's role can be found in Chapter 11.

In addition to the establishment of an independent environmental monitoring and research institute, the panel believes that there are other "bridge-building" measures that must be implemented to reduce the division and conflict that this Project has created. These measures include the expeditious settlement of unresolved land claims in the area and the establishment of a caribou management board (discussed in Chapter 8).

2.3 Land Claims and Aboriginal Rights

The most publicized dimension of the Project is the social tensions it has raised, particularly in Labrador. This is a controversial and divisive project that has polarized many social groups, and this is the aspect of the Project that has been principally conveyed to the rest of the country. In general terms, it appears that a person's assessment of the Project is directly related to his or her economic dependence on it. For example, half of the members of the LIA live in Happy Valley-Goose Bay, and they appear to favour the Project, because many of them derive employment from it. Many of the LIA members living in the coastal areas, on the other hand, appear to oppose the Project, not only because they feel it has adversely impacted on the environment and on their traditional harvesting, but also because they see themselves as deriving no direct benefits from it. The same may be said of the Inuit of Nunavik.

The Innu of Labrador and Montagnais of the Lower North Shore of Quebec strongly reject the Project because they feel it harms the environment and their health, provides no benefits to them and frustrates their land claims. The panel finds it difficult to formulate its position on these issues in greater detail given that these aboriginal groups did not participate at the public hearings. On the other hand, the settlers, Inuit and Métis of Happy Valley-Goose Bay and North West River who depend on the Project for jobs or indirect income favour the training program, provided the environmental effects of the Project are well managed.

The people of Labrador West support the Project because they see few adverse effects and feel that there are economic benefits accruing to them. Finally, the non-aboriginal people of the Lower North Shore of Quebec, many of whom go out on the land in the southernmost part of the training area, see little impact or problem. They have other concerns and are largely disinterested in the Project.

From the perspective of the four native groups with outstanding land claims, their land claims settlement with Canada and the provinces is the single most important and lasting action that can be taken to turn things around. This view is shared by the business community and by many Labrador residents, native and non-native alike, who feel that the development of the peninsula's resources is basically stalled until the claims question is resolved. There is broad support for speedy settlement of native land claims.

2.3.1 Comprehensive Claims Policy

Most of the area under review is subject to comprehensive land claims negotiations.

The primary purpose of claims settlement is to conclude agreements between aboriginal groups that assert unextinguished aboriginal rights and the federal and provincial governments concerned. These tripartite agreements allow aboriginal peoples to determine their own development and future through aspects of self-government and create certainty with respect to the ownership and management of lands and resources. They also create a special relationship between the Crown and the aboriginals concerned. In essence, these treaties result in a clearly defined package of rights and benefits that are constitutionally protected.

Aboriginal rights have been recognized by the courts, and the Supreme Court has concluded that they are unique to each aboriginal group. Aboriginal rights generally relate to traditional activities of a group within the geographic area it has historically occupied; hunting and fishing are but two examples. These aboriginal rights, although undefined, are constitutionally protected under section 35 of the Charter of Rights and Freedoms. The aboriginal group receives treaty rights through comprehensive land claims negotiations in exchange for these undefined rights.

In the resulting treaties, aboriginal groups usually receive ownership of some of the claimed area and other benefits, such as exclusive rights to wildlife harvesting and guaranteed participation in management of land, renewable resources and environment. There are also financial benefits, through direct payments, resource revenue sharing and economic development opportunities. Benefits vary from one settlement to another, reflecting specific differences. Self-government on designated lands is probably the most important benefit of all.

2.3.2 Claims in the Low-Level Training Area

Three claims have been accepted within the Project area and are being negotiated at present:

- Conseil des Atikamekw et des Montagnais (CAM);
- Labrador Inuit Association (LIA); and
- Innu Nation.

A fourth claim (Labrador Métis Association) is expected to be filed with the two governments in the near future. In the case of the CAM and LIA claims, negotiations towards Agreements-in-Principle are proceeding. Negotiations towards a Framework Agreement with the Innu Nation are on hold. There are considerable land area overlaps among these claims, which must be satisfactorily settled before final decisions are taken (Figure 3). The LIA advised that it has begun discussing the overlap question with the Innu and the Inuit of Nunavik and that progress is being made.

However, there is considerable frustration and bitterness among the native groups about the extremely slow pace of negotiations. Governments claim that this is due to the comprehensive and complex nature of the issues being negotiated, to the fundamentally different conceptions of the nature of aboriginal rights and to the form that the final agreement should take.

Native claimants, on the other hand, ascribe the protracted delays to federal-provincial squabbling about the cost sharing of claims settlements and to other side issues. The LIA also complained about the high cost of the delays, over which it has no control and which must be repaid to government from settlement monies. The general public characterized the problem as a "political" one and exhorted the protagonists to get on with it so that the legitimate concerns and rights of the native people are met and respected and the uncertainties about development resolved.

2.3.3 Aboriginal Perceptions of the Land Claims Process

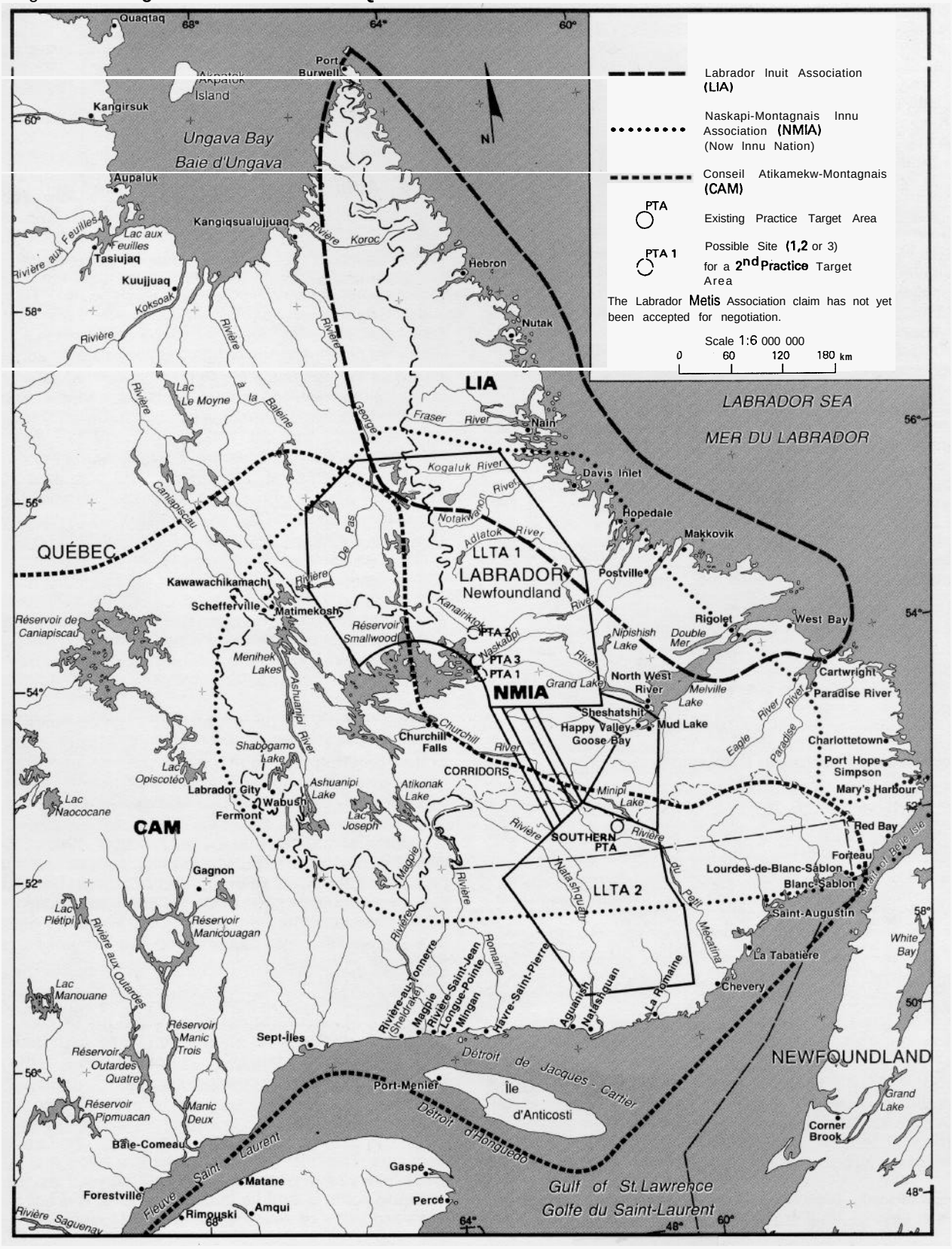
Native claimants feel that they are being discriminated against by governments because they cannot negotiate from the same position of strength as can other groups whose claims are settled. In other words, the lack of a claims settlement translates into an inability to protect the very aboriginal rights that gave rise to a land claim in the first place. In addition, the Labrador Inuit do not feel that they are treated as an aboriginal people by the Government of Newfoundland and Labrador, but rather that they are treated as a minority within the general public.

At the hearings, the LIA provided a detailed list of the aboriginal rights it believes exist in its situation. They include the rights to use and occupy their homeland in accordance with Inuit customs and tradition, in conditions of freedom. dignity and equality without unjustifiable interference from the Crown. These rights to hunt, trap, fish and gather all fauna and flora of their territory are seen as the embodiment of their identity and as the legal and political symbol of their special status in Canadian society. The Inuit believe their rights also include the right to self-government, which, in turn, means the right to participate in environmental protection and environmental impact assessments (EIAs). Their rights include rights to land and participation in land use plans, such as the management of wildlife habitat. They also include the rights to cultural resources.

The LIA noted that it was the only group of Inuit in Canada without a land claims settlement and that it continually had to fight a rearguard action to protect its rights. It also made the point that its participation in the hearings and its recommendations to the panel would always have the objective of protecting the aboriginal rights of its members and advancing the land claims process.

Although they boycotted the public hearings, the CAM, the Innu Nation and the Naskapi of Quebec did present a very comprehensive brief to the panel as part of their review of the revised EIS. One lengthy section entitled "Critique of the Treatment of Impacts of the Project on Innu Aboriginal Rights, Negotiation and Settlement of Innu Land Rights and Innu Human Rights" includes a description of the aboriginal rights that are in play and their origins. The point is made that these rights derive from the Innu peoples' historical position as self-governing peoples who have occupied and used the land for centuries. The brief goes on to say that aboriginal rights include everything necessary for their survival as a people, including rights to land, language, economic and cultural practices and forms of self-government. CAM pronouncements in

Figure 3 - **Aboriginal Land Claims in the Quebec-Labrador Peninsula**



its land claims negotiations echo the same sentiments as did those of the Naskapi in the mid-1970s before they signed the Northeastern Quebec Agreement. It is evident that all aboriginal groups define aboriginal rights in basically the same terms.

During the hearings, the Inuit of Nunavik summarized for the panel the benefits they have received from the James Bay and Northern Quebec Agreement, signed almost 20 years ago. They explained how they control several institutions, such as the Makivik Corporation, the Kativik Regional Government and the municipal corporation in each community. These various bodies are mandated with specific responsibilities and funds to promote the socio-economic and cultural development of the Inuit. An Inuit woman from Kangiqsualujjuaq indicated that any kind of land claim gives power to the people, by giving the people the ability to control things such as local airlines and the educational system. She indicated that along with land claims comes pride, which spawns peacefulness among communities and preservation of culture.

The panel noted the dynamism in Kuujjuaq: a new headquarters for regional government, several new enterprises, a new sports centre with a hockey arena and an evident sense of purpose and cultural pride among its residents. It appears that the Inuit of Nunavik are moving towards the eventual creation of a third level of government in the Canadian family.

2.3.4 Impact of the Project on the Land Claims Negotiation Process

In terms of the Project's impact on land claims negotiations, the LIA feels that the Project has significantly delayed the negotiation process. The LIA has directed considerable resources to dealing with the Project that it feels should have been directed towards the land claims process (e.g. negotiation of the LIA-DND MOU).

The LIA feels that the Project may have significant negative impacts on aboriginal people, the environment and other resources. such that the existence of aboriginal rights becomes hollow and meaningless. The Project may also serve to displace aboriginal economies further and to discount the inherent value of aboriginal culture and traditions.

The LIA is also concerned that the new arrangements resulting from a land claims agreement that come into effect after the Project is approved will not apply to the Project.

The Government of Newfoundland and Labrador and the federal government do not feel that the Project impedes the land claims process, because they are two separate and distinct processes. The Department of Indian Affairs and Northern Development notes that DND has stated that it will abide by the terms of whatever new comprehensive land claims agreement is put in place.

The province also stated that its policy is to consult aboriginal claimant organizations on development proposals within the land claims areas and that the interests of aboriginal claimants, permanent long-term residents, third parties and the general public are all considered.

Whereas the CAM, the Innu Nation and the LIA see very distinct benefits awaiting them in claims settlements, they believe that the flight training project will prejudice the outcome of their negotiations, because DND represents a third-party interest in the claimed area. They feel that their aboriginal rights and, therefore, the federal and provincial governments' obligation to come to terms with them take precedence over any other kind of interest or development in their "unceded" territories, and that their selection of lands should not be impeded by external or third-party considerations. They even question the designation "Crown" lands. Much was said in the three groups' briefs about the federal government's trust responsibility vis-à-vis native rights (aboriginal and treaty) and the **Sparrow** decision by the Supreme Court, which embodies a test for determining whether rights are infringed upon and the remedies that can be applied.

Although the claim policy of the federal government allows for the creation of interim measures either before or after an Agreement-in-Principle is reached, these relate mainly to land and resource matters that are administered by the province. The LIA feels that, in Labrador, the interests and needs of the natives are dealt with only after those of the general public and of third parties.

The panel believes that the settlement of land claims will be the catalyst or "social contract" through which aboriginal people in Labrador and Quebec will find their place as equals in the Canadian family.

For this reason, the panel believes that settlement of land claims in the Project area will constitute significant bridge building. Through power sharing, aboriginal and non-aboriginal peoples will develop mutual respect and trust in each other's abilities and aspirations.

The panel concludes that the federal government, as trustee of native rights, must assume a more forceful and proactive role in the negotiations of comprehensive land claims by reasserting the special position of native rights in the Canadian Constitution and the resulting obligation this places on both Canada and the provinces to deal fairly and honourably with the native peoples.

3. **The panel recommends that, given the perception of the aboriginal groups that the Project negatively influences their land claims negotiations, the federal and provincial governments settle aboriginal land claims quickly.**

3.0 PROJECT COMPONENT ISSUES

The history of low-level flying at Goose Bay and an overview of the activity levels in the post-1979 period were provided in Chapter 1. Generally, the current airspace used for low-level flying, which covers some 100 000 km^2 in two blocks northwest and southwest of the Base at Goose Bay, has remained essentially unchanged since the introduction of low-level training in the form it is practised today -that is, training involving jet tactical aircraft operating at high speed at very low levels, down to 100 feet AGL.

This activity, involving forces of the United Kingdom, Germany and the Netherlands, has been the subject of an exchange of notes with the Canadian government setting out the conditions under which the forces of one country can be stationed in another, recognizing the principles of the NATO Status of Forces Agreement signed by NATO members in June 1951. An MMOU between DND and the participating defence departments was signed in 1986 for a period of 10 years. The original signatories included the United States Department of Defence, which withdrew in 1991. The Netherlands Ministry of Defence, although not an original signatory, joined the MMOU in 1987.

3.1 Multinational Memorandum of Understanding (MMOU)

The MMOU is an implementing document dealing with the general nature of flight training at Goose Bay, cost sharing, financial terms, etc. It defines the numbers of aircraft and numbers of military personnel of each nation that may be stationed at Goose Bay. It does not, however, specify the type of training or numbers of sorties that may be undertaken by these aircraft.

The Allied personnel and aircraft numbers that are authorized at Goose Bay under the terms of the current MMOU are shown in Table 1. All three air forces are authorized to conduct low-level tactical training using transport aircraft going to and from Goose Bay in support of low-level flying operations. These flights are permitted to operate down to 250 feet AGL on established routes around the periphery of the training areas. The panel believes that if airspace boundary changes are introduced in the future, these routes should be realigned to bring them inside training airspace and have avoidance criteria applied accordingly.

Table 1
Allied Personnel and Aircraft under the Existing MMOU

Air Force	No. of Military Personnel	No. of Combat Aircraft
Royal Air Force	350*	20'
German Air Force	400	25
Royal Netherlands Air Force	400	25

** The Royal Air Force requests the same levels of personnel and aircraft as the other two Allies in a new MMOU.*

4. **The panel recommends that low-level tactical transport routes be established within the boundaries of the training areas and that avoidance criteria be applied accordingly.**

Provision is also included in the MMOU for the use of Goose Bay by other nations, provided agreement and suitable funding arrangements are concluded with the Allied users who are signatories to the MMOU. During the hearings, DND indicated that interest existed for other nations' participation. It was stressed, however, that such participation, if it occurred, would not lead to an overall increase in flight activity projected in a new MMOU. It is clear that DND views additional national participation as desirable, as it would make the Project more attractive financially, spreading the cost of joint use facilities among more users.

It is important to note that the MMOU provides for an opt-out clause on the part of each participating nation, provided 12 months' written notice is given. A provision also exists for a year-by-year extension of the MMOU on request of the military users while negotiations on a new MMOU take place, provided that an exchange of notes between the governments of the military users exists.

During the hearings, renegotiation of the MMOU came under discussion with respect to the possible termination of flying prior to the end of a renewed MMOU. **It was suggested, and the panel agrees, that an opt-out clause of 12 months is not a reasonable warning of intention on the part of an Ally.**

5. **The panel recommends that DND, in renegotiating the MMOU, strive to increase the opt-out provision to a minimum of two years.**

3.2 Post-l 996 Period

The use of facilities at Goose Bay and airspace in the low-level training areas by the Allies has increased marginally over the life of the present MMOU (1986–1992), reaching a total of 9733 flights in 1992. Of this total, 7355 flights were low-level flights (below 1000 feet). This is consistent with the assurances of the Minister of National Defence, who stated that the numbers of low-level flights would not significantly increase beyond 8000 until the environmental assessment review was complete. These figures are below the levels that were anticipated in 1986. However, they appear to be in a range consistent with the available airspace, taking into account the avoidance program that DND introduced in 1990 and the changes to the avoidance program that have been required as additional information became available on wildlife, habitat and land use. Details of the avoidance program are contained in Chapter 9.

From an aircrew training perspective, the withdrawal of airspace necessary to meet the evolving avoidance criteria has restricted aircrew training to a point where the viability of the training program is now in doubt unless additional airspace is

provided or less stringent avoidance criteria are adopted within the airspace currently allotted.

DND has estimated that the requirement of the Allies in the post-1996 period will generate up to a maximum of 11 800 low-level missions to fully utilize their capital investments in Goose Bay and the numbers of tactical aircraft they have requested be deployed to Goose Bay each flying season. In addition, provision has been made in planning to accommodate up to two additional nations in the program, which would require a further 2525 flights annually. The Canadian Forces may generate 675 flights each year, bringing the total maximum low-level sorties to 15 000 annually. It is also estimated that 3000 other flights (above 1000 feet) will be required to support this level of training. These would mainly be transport-type aircraft staging to and from Goose Bay and aircraft deployed to Goose Bay for exercise purposes with the Allies.

Ninety percent of low-level flights are likely to be at 500 feet or below, and approximately 15% of these will operate as low as 100 feet AGL.

To accomplish this additional training, DND has proposed that the flying season be extended to nine months, with flying commencing on March 1 and concluding on November 30 each year.

The panel concludes that an increase in the number of flights over the current level makes the Project more economically viable. Moreover, there is little evidence of environmental damage at this time on which the panel could base a recommendation to cap the flights below the level proposed by DND. It is clear to the panel that increases in low-level flights up to maximum of 15 000 will occur progressively, and indeed the maximum may never be reached. Recommendations are made throughout this report that will ensure mechanisms are in place to monitor and control these increases at acceptable levels throughout the life of a new MMOU.

Helicopter flying in support of Allied activity is likely to generate up to 1000 flights annually in the training areas. These flights are normally carried out above 1000 feet in transit to camera targets and the PTAs. **These flights will not increase under a new MMOU, and the panel concludes that they are unlikely to be a problem in the future. It should be noted that military helicopters constitute a small proportion of the total number of helicopter flights in the area.**

Concerns were raised during the public hearings regarding DND's plans to increase night flying by the Allies in the low-level training areas. To date, the number of low-level night flights has been low during the flying season. Statistics show a small increase over the 1990-l 992 period, to a peak of 50. DND projects a significant increase in the number of night flights under a new MMOU, up to a maximum of 1400 flights annually.

Aircraft equipped with terrain-following radar may operate down to 250 feet AGL at night. Aircraft without this capacity will be restricted to altitudes at or above 1000 feet AGL. Night flying normally begins 30 minutes after sunset, and DND proposes to terminate flying by midnight. With the long summer light conditions at Goose Bay, it will therefore be necessary to concentrate night flying in the early spring and autumn months of the flying season. Within the proposed nine-month flying season, there will be six months when night flying can be conducted without delaying takeoffs into the late evening hours.

At the hearings, the Town of Happy Valley-Goose Bay raised concerns about night flying and requested that no engine run-ups, takeoffs or landings be carried out between 11 p.m. and 7 a.m. local time. As a noise abatement measure for people living near the airport,

6. **The panel recommends that no takeoffs or run-ups associated with low-level flying be carried out after 11 p.m. local Goose Bay time.**

3.3 Option “A” and Option "B" Configurations

In an attempt to accommodate the increased flying requested by the Allies, DND examined two mitigative options, referred to as Option “A” and Option "B" in the EIS. Option “A” examines the present airspace assigned to low-level flying to determine what reduced avoidance criteria would be necessary to accommodate an increase in flying up to 15 000 low-level flights annually.

Option “B,” on the other hand, proposes to change the airspace assigned to Allied training to avoid sensitive wildlife areas that have been identified through field work and consultation with users of these areas. DND also proposes under this option to increase the total area available for low-level flying to 130 000 km^2, with the expectation that a minimum of 100 000 km^2 will be available to the Allies throughout the training season; the balance would provide flexibility sufficient to maintain higher and more acceptable levels of avoidance than would be the case under Option “A.” The areas now in use for low-level flying and the proposed expansion and realignment under Option "B" are outlined in Figure 2 (see Chapter 1).

3.3.1 Option “A”

Prior to 1990, field work carried out by DND focussed mainly on the George River caribou herd. Early mitigative measures were introduced in the form of block avoidance in areas where large groups of caribou had been identified. Similarly, calving areas, where they could be identified, were also given block protection during the spring calving period.

During the preparation of the earlier EIS (1989), it became clear to DND that the importance of the caribou herd to both aboriginal and non-aboriginal users warranted increased emphasis on information gathering related to this important species. Moreover, consultation coupled with ongoing field work highlighted the need to consider protection of other wildlife, notably cliff-dwelling raptors in the general area around Harp Lake in the northeast portion of LLTA-1. As a consequence, the avoidance criteria Introduced in 1991-1992 reduced the

airspace available for training by as much as 40% during periods in the late spring and early summer.

Under pressure from the Allies, DND concluded that the restrictions imposed under the developing avoidance program would seriously undermine any negotiations leading to a renewal of the MMOU and an expanded training program in the post-1996 period. Hence, DND recommended that if Option "A" is to apply in the future, the avoidance criteria for wildlife and human activity in the training areas must be reduced to make this a viable option for the Allies.

3.3.2 Option "B"

It is clear in Figure 2 that Option "B" proposed by DND involves much of the airspace currently in use for low-level training. However, it eliminates critical areas of habitat used by the George River caribou herd before, during and after the important calving period. Those areas around Harp Lake and the headwaters of rivers flowing east into the Atlantic Ocean that provide prime breeding waters for the eastern Harlequin Duck have also been removed. Another area in LLTA-2 is also eliminated to provide more buffer between the low-level flying and the coastal communities along the Quebec Lower North Shore.

DND believes that eliminating this airspace for flight training and replacing it with airspace in the western quadrant from Goose Bay will provide the necessary 130 000 km^2 needed to carry out the training proposed under a new MMOU. By shifting the training airspace away from the Labrador coast and land used by the George River herd, DND believes that potential impacts on communities and people on the Labrador coast will essentially be eliminated. On the other hand, opening up new airspace to the southwest of Goose Bay means that potential impacts of low-level flying on wildlife and land use will be shifted more towards regions traditionally used by the Innu, Montagnais and non-aboriginal peoples of the Quebec Lower North Shore.

The new airspace to be opened up to low-level flying has not been subjected to this type of activity in the past and as such provides an excellent opportunity for the acquisition of baseline data before the area is released for low-level training. This, in turn, would provide a reliable and scientific approach to future assessment of the impact of the Project and of the validity of avoidance criteria proposed or in effect over and around wildlife, camps and other land users in this area.

During the summer of 1993-1994, some field work and data collection were carried out by DND in new areas proposed to be used under Option "B." **It is the view of the panel that, although this information is useful, it will need to be supplemented with more baseline data before the area can be released for low-level training. The panel is also of the opinion that insufficient resources are earmarked and insufficient time is available prior to the renewal of the MMOU in 1996 to carry out the necessary field work throughout all the new areas being proposed under Option "B." It is, therefore, not practical to consider moving directly to this option. The only realistic approach would be to concentrate efforts in 1995 on the area already under study, with the objective of releasing this limited area to flying in the spring of 1996. In other words, the best approach would be to adopt a progressive transition from Option "A" towards Option "B."**

Option "B" as proposed would become a general outline of the desirable area for future training airspace on the basis of habitat and land use information available at this time. This is supported by the panel, because it would permit adjustments to be made to the boundaries on a timely basis in response to more data, changing wildlife patterns, human land use or, over the longer term, other more permanent developments such as parks or reserves. Flexible airspace boundaries will enhance avoidance mitigation programs while at the same time ensuring that adequate airspace (100 000 km^2) is available for Allied training.

What is essential in adopting a flexible approach to airspace allocation is public input into and understanding of the rationale behind airspace management decisions that are taken on a month-by-month or seasonal basis. This is a task for the proposed Institute.

7. **The panel recommends that Option "B" airspace with flexible boundaries be accepted as the preferred option for renegotiation of the MMOU in 1996.**

8. **The panel recommends that a baseline study program be implemented immediately so that sufficient data are available before low-level flights are switched to the new training area.**

9. **The panel recommends that DND give priority to field work in 1995 that will ensure that new airspace is available for Allied flying by the beginning of the 1996 season.**

10. **The panel recommends that the Institute review and recommend boundary changes and release of new airspace prior to any approval being granted by the appropriate agencies.**

3.4 Practice Target Areas (PTAs)

PTAs differ from other project components in that they represent actual physical disturbance to the land and they close the area to other uses; as such, they have a more immediate and visible impact on the environment and land use.

A 4-NM-radius PTA, covering 173 km^2, 100 km southwest of Happy Valley-Goose Bay, has been in operation for a number of years. It is located on burnt-over land away from waterways and any high-use harvesting areas. It was selected in consultation with the Newfoundland and Labrador government, and a permit was issued to DND for the use of this area for the release of cement-filled, inert weapons. The PTA is a restricted zone and is posted to that effect. Within the PTA, there are target complexes, surface-to-air missile sites made out of plywood, a simulated runway and mock airplanes. It is daily practice, prior to the release of inert weapons, to overfly the area to ensure that there are no people in the PTA. Clean-

up of the area is carried out annually by DND, and the Newfoundland and Labrador government monitors the site.

DND proposes to establish a second PTA to provide more tactical flexibility with the increased numbers of sorties required by the Allies under a new MMOU. There is congestion over the current PTA, and the weather often limits its use. The Allies would like to have separate areas within the proposed PTA to represent different types of targets: a manufacturing area with vertical development, and simulated rail lines or roads.

Three potential sites are indicated on Figure 1 (see Chapter 1). DND has stated that the final decision will be taken in consultation with the Newfoundland and Labrador government if and when financial costs are worked out with the Allies. DND has estimated the cost of the new PTA at $6 million.

DND has stated a preference for site 1 because of road access, the relatively low potential for wildlife and the distance from permanent settlements. DND said that there are many more sites that could be considered, but work has been done on the selected three in terms of initial archaeological examinations by the province and consideration of environmental issues.

The proposed PTA would cover an area of about 300 km^2. Range boundaries would be marked so as to be visible from the air, and there would be periodic publication of the location of the PTA. Civilian aircraft wishing to fly within 30 NM of the PTA at an altitude of 1000 feet AGL or less would require clearance to do so from the Military Co-ordination Centre prior to takeoff. Similar conditions and restrictions apply to the existing PTA.

If funding is made available, the proposed second PTA may be developed to provide more realistic training by the addition of threat emitters and the capability to handle forward-firing weapons. In either scenario, the immediate target zone of 5-NM radius will become a restricted area and be posted. Art-craft approaches to the target will vary within a 180-degree moveable semi-circle or "special access area" around the target for tactical reasons or for avoidance of camps or harvesting activities.

Within the special access area, the following would be avoided:

- calving areas of the George River caribou, when occupied;
- other large concentrations of caribou;
- critical habitat for species or populations classed as endangered (e.g. Harlequin Duck); and
- occupied camps within designated "high-use" resource harvesting areas.

Some concern was expressed that one of DND's three proposed sites (site 2) for the new PTA overlays the headwaters of the Kanairiktok River. DND confirmed that there are rivers running through site 2 but added that all of the proposed PTAs have water systems within them. Although DND could provide no guarantee that an inert bomb would not land in the water, it stressed that the pilots are trying to hit mock targets, not a river or lake.

The panel feels that because of the higher levels of flights that occur in and around a target complex and the possible impacts on land use and contamination of waterways associated with these flights, great care must be taken in the selection of the second PTA to minimize land impacts and disturbance to people harvesting the land in the vicinity of the target. Moreover, the proposed sites have been chosen for ease of access as well as tactical reasons. Ease of access means that more people will be making use of the area for harvesting and hunting. Risks to these people must be minimized by careful screening of the target and surrounds on a daily basis before aircraft are allowed to use the target area.

11. The panel recommends that the location of the second practice target area be assessed by the Institute before Newfoundland and Labrador government approval of the site is requested.

3.4.1 Impact of the Proposed Practice Target Area on Land Use

Whereas there was general concern about the impact of the Project on aboriginal and non-aboriginal land use, there was particular concern about the impact of the proposed preferred PTA and "special access area" on these activities.

In terms of non-aboriginal land use, the communities located the least distance from DND's preferred proposed PTA are Churchill Falls (70 km to the southwest) and Happy Valley-Goose Bay (about 150 km to the east). This site is also accessible by road from Churchill Falls (by a Churchill Falls Labrador Corporation road). For Happy Valley-Goose Bay, DND found that the vast majority of all resource harvesting activities practised by the residents are well outside the special access area. None of the "high-use" harvesting areas used by residents of the town are located within the special access area.

According to DND, the area harvested by Churchill Falls residents is extensive (approximately 9000 km^2). Although none of the high-use harvesting area defined for the community of Churchill Falls overlaps either the site of the proposed PTA or the special access area, there are approximately 850 km^2 (or 10%) of the total area harvested by residents of Churchill Falls located within the proposed PTA and special access area. DND concluded that, although the establishment of a PTA in this location is likely to affect those individuals who currently harvest in the vicinity of the PTA, it would not have a significant impact at the community level.

In terms of aboriginal land use, DND concluded that Sheshatshit is the only aboriginal community that harvests wildlife in the vicinity of the preferred proposed PTA. Sheshatshit is located about 175 km from the site and about 135 km from the outer limit of the special access area leading to the PTA. DND estimated that the total area harvested by the Innu of Sheshatshit is 20 000 km^2. The total overlap between

Sheshatshit harvesting and DND's preferred new practice target location, including the special access area, is estimated to be 1625 km^2, or less than 10% of the total harvesting area. Other indicators of harvesting and land use, such as the presence of campsites, shaking tents and kill sites for large game, are not found within the PTA and are found in very limited numbers within the special access area.

Although DND admits that it cannot anticipate how Innu harvesters or others may respond to being exposed to the greater frequencies of low-level flights, it still concludes that the impacts on harvesting will be minor to insignificant given the limited area affected.

3.5 Camera Target Areas

At the present time, there are about 70 camera targets in the low-level training areas. These targets are used regularly by Allied crews and do not involve any weapon releases. Under the MMOU, 60 of these targets are required to be available for use at any given time. These targets are small plywood structures simulating enemy installations or field targets such as vehicles or tanks. They are constructed, installed and maintained by DND. When a target is no longer used, it is relocated to a new site, and a clean-up is carried out by DND at the abandoned site.

Under the mitigative Option "B" configuration, new camera targets will be required to replace abandoned sites now in use by the Allies. The Allies have also indicated a requirement for a number of infrared targets, which will call for some type of heat source yet to be identified by DND. Under a new MMOU, the total number of camera targets will not increase above the present 70 sites.

DND has no defined selection criteria for the location of camera targets. The panel feels that it is important in the selection of new sites to consider such factors as land use, camp locations, wildlife and habitat.

12. **The panel recommends that specific criteria be developed to evaluate the suitability of proposed camera targets and that land use be an essential element of those criteria.**

The above recommendation would be especially important as new areas, such as those covered by mitigative Option "B," are included in the low-level training area. DND said that any adjustments to the training area boundaries would result in a need to create new camera targets in the new areas, thereby dispersing flight activity throughout the training area. To prevent an encroachment on resource harvesting activities and sensitive wildlife, the previously recommended formal selection and evaluation criteria would be essential.

A final concern of the panel was that camera target locations had not been entered into the data base of the Geographic Information System (GIS) that is used to monitor flights and closure areas. **The panel concluded that the inclusion of this information into the GIS would allow for the easy identification of targets and permit monitoring of flight paths in the training areas.**

13. **The panel recommends that the location of camera targets be entered in the Geographic Information System so that information on them is readily available.**

3.6 Flight Safety

Concern was expressed during the review process regarding flight safety. These concerns ranged from risk of mid-air collisions between civilian and military aircraft in the training areas to questions as to the ability of the air base to handle safely the increased military traffic proposed under a new MMOU.

3.6.1 Aircraft Accidents

The pattern of Allied aircraft accidents since the early 1980s has shown a reduction in the accident rate throughout this period. As the DND technical report on flight safety points out, an analysis of potential accidents is not a prediction of how many accidents will occur but is merely an assessment of the degree of risk attached to flying operations. Past history, as the report states, may serve as a risk guide but not as an accident prediction methodology. Nonetheless, it is useful to examine the pattern of accidents over recent years.

Since 1989, the activity level of the Allies has remained reasonably stable, and the accident rate, calculated using the Canadian Forces baseline of 10 000 hours flown, has been determined to be 1.22 accidents per 10 000 hours of flying over a period of four years. As sortie durations average slightly over an hour, DND has stated that there is a potential risk of 2.4 accidents occurring based on 15 000 sorties per year. As a comparison, the average loss rate over a lo-year period at Cold Lake, under somewhat similar flying conditions, was 1.7 per 10 000 hours of flying.

3.6.2 Airport Safety Considerations

The airfield at Goose Bay is equipped with a full range of approach aids, and approach control and tower facilities are provided by DND. The ability of an airport to handle a heavy flow of traffic depends on a number of factors, such as runway configurations, approach aids and weather.

DND used a Transport Canada model to calculate the capacity of the airfield and concluded that it has the capacity to handle up to 18 000 flights without unduly restricting other operators now using the airfield.

Local airline operators acknowledged during the hearings that the modern approach and control facilities available at CFB Goose Bay are an important benefit to all operators using the airfield and provide an important contribution to flight safety around the airport. It is also acknowledged by civilian operators that the phase-out of military low-level flying would likely lead to the withdrawal of many of these facilities.

During the hearings, a Transport Canada official raised no specific flight safety concerns regarding the low-level flying program and stated that no complaints were on record from local airline operators. Transport Canada is also satisfied that

with present facilities and approach aids the airfield should accommodate the proposed mix of military and civilian traffic.

The panel is satisfied with the arrangement between civilian operators and DND for use of the airfield. To date, there do not appear to have been any problems in co-ordinating the mix of civilian and military traffic around the airfield.

Insofar as the increased level of military flying is concerned, the panel concludes that the airport is equipped to handle, and capable of handling, the additional traffic without undue restrictions on civilian operators now using the airfield.

Under Option "B," the boundary of the low-level flying area encroaches on airspace near Churchill Falls, where significant helicopter traffic occurs around the Smallwood Reservoir in support of the hydro generation station at Churchill Falls and associated transmission lines. DND and the Churchill Falls Labrador Corporation have addressed this problem, and procedures have been discussed that should provide the necessary separation between low-level flying and company helicopter activities if Option "B" is adopted.

14. The panel recommends that DND formalize procedures with the Churchill Falls Labrador Corporation **in Churchill Falls for the conduct of low-level training in that area to minimize the risk of collisions between helicopters and low-flying jets.**

Within the low-level training areas, low-level airspace is uncontrolled, and civilian traffic operating in these areas must maintain visual lookout for other traffic. Again, procedures have been developed whereby the Military Co-ordination Centre at Goose Bay maintains contact with civilian operators so that both military and civilian pilots are aware of daily traffic in the training areas.

Prior to the hearings, no co-ordination had taken place between DND and Transport Canada. It is essential that this co-ordination take place prior to any airspace boundary changes so that information will be made available to civilian operators through "Notice to Airmen" information circulars and other flight information maps and publications.

15. **The panel recommends that DND co-ordinate closely with Transport Canada on changes to flying boundaries and procedures associated with the Allied low-level flying program.**

4.0 ECONOMIC AND EMPLOYMENT IMPACTS

4.1 Importance of the Project to the Happy Valley-Goose Bay Region

The panel was presented with much information indicating the importance of low-level military flying to the community of Happy Valley-Goose Bay. The panel was told that military flying has served as the backbone of the Town's economy for over 50 years. In that time, Happy Valley-Goose Bay has become one of the most stable and prosperous communities in Atlantic Canada.

From information presented at the hearings, the panel learned that CFB Goose Bay provides 1441 direct person-years of employment. The indirect and induced impacts provide a further 790 person-years of employment to the local economy, for a total of 2231 person-years of employment. The economic foundation that this employment provides finances a high level of education, social, cultural and recreational facilities and activities for the community. The Atlantic Canada Opportunities Agency (ACOA), a federal government regional development agency, stated that the Base provides 35% of employment in Happy Valley-Goose Bay and accounts for 31% of employment income in Labrador. ACOA also reported that 90% of income in the community is employment generated and that only 8% is attributable to government transfers. This compares very favourably to the provincial breakdown of income of 73% and 21%, respectively.

The economic importance of low-level flying to the Upper Lake Melville region alone is demonstrated by its contribution to the local Gross Domestic Product. According to a report produced by a consultant hired by the Town of Happy Valley-Goose Bay, the activity contributes $77.4 million to the local economy. In addition to this, the report findings show that an additional $50.9 million is added to the provincial Gross Domestic Product, for a total contribution of $128.3 million to Newfoundland and Labrador. The Town estimates that the Base generates over $100 million a year in foreign currency for Canada. According to the economic models run by the consultant, the total employment impact on Canada of CFB Goose Bay amounts to 5425 person-years.

In addition to the economic benefits provided to Happy Valley-Goose Bay, many participants stressed the social and cultural benefits of having people from other countries and different parts of Canada living in their town.

While intervenors recognized the importance of the Base to the local economy, many also recognized that any region in which employment and income are heavily dependent on a single major activity is economically vulnerable. This is true of central Labrador in respect of the Base and will be discussed in the following section covering project termination and economic diversification of the region.

The panel agrees with the large number of presenters who stated that CFB Goose Bay is the economic base for the Town of Happy Valley-Goose Bay. Furthermore, the panel recognizes that the economic benefits of the Project are also significant to the economic prosperity of central Labrador.

4.2 Employment

In terms of employment, the panel heard about the need for increased job training and employment equity opportunities and also about concerns regarding job losses as a result of project termination. As was noted previously, the Base provides 1441 person-years of direct employment. DND indicated that not many new jobs will be created by the Project's expansion, and those that will be created require limited skills. The estimated number of new direct and indirect jobs is only 127, with 114 direct jobs on the Base (37 military and 77 civilian).

Aboriginal employment was raised as an issue that needed to be addressed by DND. Whereas DND stated that identifying the aboriginal work force is extremely difficult because self-identification processes have not been successful, it was satisfied with its current levels of aboriginal employment. It stated that one-third of Labrador's 30 000 population is of aboriginal descent (10 000); this compares well with aboriginal employment at the Base, where, out of 1000 employees, about one-third (300-350) are of aboriginal descent (half being Inuit and the other half being Métis). Some aboriginals in wage employment said that cash income from employment greatly improves their living standard, while allowing them to continue their ties to the land.

A study on the impacts of low-level flying on the Innu (1987-1988) showed that the Innu respondents were concerned about a lack of jobs. Forty-one percent of the respondents did not think that the Project would bring them jobs. DND feels that it is unlikely that the Innu will directly benefit from the jobs or the expenditures of an expanded project. The panel was told that DND hired an Innu woman to recruit Innu people from Sheshatshit and Utshimassit. DND stated that 20 Innu workers were employed that flying season but that the program was cut the next year because of lack of funding.

The Union of National Defence Employees and other employees raised concerns about the civilian role at CFB Goose Bay, employment equity and apprenticeship programs. Others had concerns about whether local people would be hired to fill any new jobs and about the levels of female employment.

DND stated that, to the extent that they are available and qualified, local persons will be hired. As 38% of the new jobs relate to employment by contractors, generally in catering and janitorial work, this portion should be met locally. Any new hiring will be done in accordance with Public Service Commission guidelines as an equal-opportunity employer. DND plans to continue to liaise as appropriate with agencies (e.g. Human Resources Development Canada) and the regional vocational college both to identify training needs and to facilitate program design.

In general, the panel concluded that few of the new jobs will require a significant amount of training. The panel is satisfied with DND's ability to identify training needs and to work with the local agencies and the regional vocational college to facilitate the appropriate program design. The panel recognizes that many aboriginal people do not have the same levels of education as do others coming into the area and are not equipped to compete for better or higher-skilled jobs. The panel noted that no long-term goals have been set for a personnel management plan to ensure adequate implementation of employment equity hiring for aboriginal people and for women.

16. The panel recommends that:

- **DND continue to work with the appropriate unions, local training institutions and Human Resources Development Canada to meet its training needs.**
- **Employment equity programs be practised to ensure hiring of aboriginal people and women. In support of this initiative, DND should pursue such mechanisms as daycare and an apprenticeship program, as required.**
- **Special attention be paid to the recruiting, training and promotion of aboriginal employees.**

4.3 Project Termination/Diversification

The panel was often told that project termination would mean the "end" of the community of Happy Valley-Goose Bay. At the same time, most groups realized that low-level military flying cannot last forever and that efforts must continue to search for alternatives to the Project through diversification of the economy in central Labrador.

Evidence of the potential impact of project termination was seen when the Americans withdrew from the Base in the 1970s. The panel heard that businesses collapsed, unemployment was high, alcoholism and social problems increased and people had to relocate in search of employment. There was a 14% drop in the town's population from 1976 to 1981 and a loss of more than 200 jobs as a result of the American pull-out. It was noted that the situation could have been much worse if the town had not had the three to four years to adjust as the Americans slowly moved out. Economic relief eventually came with the low-level military flying project,

The devastating effect that the American pull-out and other failed industries, such as Labrador Linerboard, had on Happy Valley-Goose Bay was noted by one local resident, who stated that his two next-door neighbours just backed up their pickup trucks, hooked on their mobile homes and headed for the ferry dock. He said that the Canadian National (CN) Ferry left Goose Bay "loaded to the doors" with entire families, only to return empty a few days later to repeat the process,

While intervenors recalled the impacts of the 1970s job losses, they also warned that the situation could not begin to compare with what would occur if the present military activity were to cease. It was felt that project termination today would lead to a significant reduction in retail and wholesale trade in Happy Valley-Goose Bay, which would, in turn, result in higher prices in a downsized market for the coastal areas of Labrador. There would also be an increase in numbers of workers returning to the coast to seek support from family members. This would put greater pressure on already inadequate public housing and social services and increase competition for the few employment opportunities that are currently available. There would be a drastic reduction in the level of government services provided to the coastal communities, and completion of the Trans Labrador highway could be significantly delayed or even cancelled.

Many citizens of Happy Valley-Goose Bay recognized the implications of project termination for their community. They recognized Happy Valley-Goose Bay as a one-industry town that would be devastated. They also stated their support for low-level military flying as a clean and renewable resource-type industry. Many saw Happy Valley-Goose Bay as one of the most desirable communities in Atlantic Canada in which to live.

Enterprise Newfoundland and Labrador, ACOA, the Town of Happy Valley-Goose Bay and the local Chamber of Commerce are all involved in seeking alternatives to military flying. The projects that have been identified in Labrador are small to medium scale (e.g. parks for Mealy and Torngat Mountains, the Ptarmigan Trail, etc.) and cannot replace employment now generated by low-level flying.

The Government of Newfoundland and Labrador noted that project termination would lead to a significant burden on social services and health facilities, with increases in unemployment, substance abuse, stress and depression and family violence and a deterioration of municipal services. The loss of tax revenue combined with increased social costs would be too much for the province to bear. This is particularly noteworthy considering the state of the fishery.

DND acknowledges that closure would lead to migration, severe unemployment and related social problems, bankruptcies and the withdrawal and decline of social services. The impacts would go beyond central Labrador, as coastal Labrador could lose the services of Happy Valley-Goose Bay, especially as a centre for air travel. Isolation of the coastal communities would increase if the Base closed. All levels of government must think about the future of central Labrador.

DND stated that the Project's primary purpose is not to provide employment or resolve labour market problems. Its purpose is to provide military flight training. DND noted that the economic activity generated by the Base, in conjunction with population growth, has enabled a certain level of economic diversification to occur. There are craft shops, bars, restaurants, cable television, fast food outlets, car rentals and tourism. Without the military. Happy Valley-Goose Bay would have to rely on reduced government expenditures and more traditional sources of employment and income. Elsewhere in the Quebec-Labrador peninsula, there has not been an equivalent economic foundation for comparable economic diversification. Private funding from alternative development has been restricted by the risk factors associated with a remote location, and not the presence of the Base.

The panel recognizes that project termination would be devastating for the Town of Happy Valley-Goose Bay and the region. It would certainly be much more severe than was the case after the American withdrawal in the 1970s. Even those groups that do not currently benefit directly from the Project, such as the Innu, would be affected by project termination, as the general services of the region declined and services commonly taken for granted were discontinued. The panel acknowledges that this is a very real possibility and that there is an even greater need for communication among all parties to face these concerns.

It appears that some preliminary work has been done by the municipal, provincial and federal governments and agencies to seek out alternative industries. The panel commends the work already under way and encourages DND to collaborate with the various levels of government and business in support of economic diversification and conversion strategies.

4.4 Distribution of Project Benefits

Many of the intervenors raised concerns that the benefits of the Project are not evenly distributed throughout Labrador. As well, concerns were raised about the Project's benefits leaving Labrador. On the other hand, many participants credit the Project with the establishment and improvement of many social and health services, Often these improved services, centred in Happy Valley-Goose Bay, also benefit coastal communities. Improved medical services and air services to the coast are attributable in large part to a thriving business climate in central Labrador. An example of another less obvious benefit is the search and rescue capability at CFB Goose Bay. Although these benefits are recognized, many communities in Labrador would like to see a greater portion of the benefits arising from training activity flow to other areas of Labrador.

The Town of Happy Valley-Goose Bay encouraged DND to co-operate with other Labrador communities in attempting to find ways to share the economic benefits. The Town noted that CFB Goose Bay contributes nearly $300 million a year to Canada's Gross Domestic Product, but less than half that amount, $128.3 million, stays in the province. The Labrador North Chamber of Commerce felt that the Project should optimize benefits by increasing local economic opportunities, by giving preferential treatment to local businesses seeking government contracts. Its analysis indicated that Labrador is getting less than half of the jobs and only one-quarter of the economic spinoff that the Project currently generates. The Government of Newfoundland and Labrador noted that the military has represented a source of stability in the area and in the province as a whole. It feels that CFB Goose Bay can act as a facilitator for economic diversification, especially in the retail and service sectors.

The LIA explained that it did not see many benefits going towards the north coast and its people outside the Happy Valley-Goose Bay area. After several attempts to sell caribou and/or fish, the Labrador Inuit have been unsuccessful in developing any business with Canadian Forces and/or the Allies at CFB Goose Bay. The LIA feels that the military has lost the opportunity to gain aboriginal support and tolerance of the military flying activities through closer economic ties. The LIA also claims that no real new employment opportunities have been created for people from coastal communities.

The communities of the Quebec Lower North Shore and other parts of Quebec visited by the panel generally found that the Project has no benefits for them. The Project lacks support in these regions because the communities feel that the Project may have significant adverse impacts on the environment and health of residents. As is discussed elsewhere in this report, other concerns were raised about the George River caribou and other wildlife that are important to their culture and survival.

The panel feels that there is a significant perception that the benefits of the Project within Labrador are limited to the Happy Valley-Goose Bay area. During hearings, DND confirmed that communities elsewhere on the Quebec-Labrador peninsula will not benefit directly from either job creation or project expenditures. They do not now.

There are, however, many indirect benefits generated as a result of the Project. According to many review participants, the construction and future upgrading of the Trans Labrador highway are closely tied to the existence of the Project. The highway, in turn, has benefited the residents of the Upper Lake Melville region through reduced transportation costs and lower prices for many goods and foodstuffs. It has also opened up a new market for businesses in western Labrador and Quebec.

DND provided information that showed that the Happy Valley-Goose Bay business community should benefit most from the Project's renewal. As sorties increase to 18 000, total expenditures are expected to rise from the present annual level of approximately $128.3 million to $176 million. Catering will gain $2.6 million (up 118%), aircraft refuelling will gain $1 million, liquid oxygen sales may increase by $2 million and janitorial services may increase by $400 000. The role of the Town as an administrative and service centre to the coastal areas will continue and may improve with economic stability. Expenditures in the local economy by the transient military personnel are expected to increase by $1.4 million, or 33%.

In terms of changing purchasing practices, business and employment opportunities with the government are governed by national and departmental purchasing and personnel policies. Notwithstanding these policies, DND feels that there are opportunities for local/regional benefits that could be explored further.

The panel believes that regional enterprises should pursue opportunities related to Base activities in a competitive and fair market.

17. **The panel recommends that CFB Goose Bay work with interested business representatives from the various regional groups of the Quebec-Labrador peninsula to clarify Base procurement needs and identify prospective**

regional suppliers. In particular, the panel encourages DND to explore opportunities for increasing local/regional benefits for aboriginal groups.

4.5 Tourism Potential

Throughout the public hearings, and as previously discussed, the need for economic diversification in Labrador was often mentioned. One possible route for diversification **was** adventure tourism, both consumptive (e.g. hunting and fishing camps) and non-consumptive (e.g. trekking, canoeing, historical sites). The panel was impressed to hear about the significant impact that consumptive and non-consumptive adventure tourism has had on the regional economy of Nunavik. The question of both current and future tourism in Labrador and its relationship with low-level training activities was therefore one of particular interest to the panel.

At the hearings, concerns about the tourism and outfitting industry centred around its ability to provide an alternative to the Project and the Project's interference with its success and continued growth. One intervenor group felt that the potential for full development of wilderness tourism and the possible establishment of wildlife reserves and parks in Labrador are being and would be directly and negatively affected by the Project. In general, the group found that low-level flying interferes with Labrador's greatest base for sustainable economic development — the natural environment. It also felt that wilderness tourism might be considered an alternative to low-level military flying. In particular, wilderness tourism might keep more dollars in Labrador if it were owned and run by local people. Success has been seen in similar tourism industries of Alaska and the Northwest Territories.

The Government of Newfoundland and Labrador presented the panel with a paper on the current state and future potential of adventure tourism. According to this paper, the industry is expanding. The annual contribution to the Labrador economy is $5 million, with $4 million coming from consumptive activities and $1 million from non-consumptive activities. The major portion of consumptive activities in Labrador involves sport fishing (37 licensed outfitters). There are 13 sport hunting operators licensed in Labrador. Only 7 of these are classified as active, mostly located west of the Smallwood Reservoir outside the current and proposed low-level training areas. Sport hunting centres around harvesting of the George River caribou. This sector has grown from fewer than 50 licences in 1990 to a projected 800 in 1994. Non-consumptive adventure tourism is not licensed, but the province identified four operators in Labrador.

There are currently nine outfitter hunting camps located within the current low-level training areas, and provincial department officials advised that they had received no complaints from any operator concerning low-level flying.

George River caribou are the primary resource supporting the important sport hunting industry in Quebec and Labrador. The panel was told that in Nunavik alone, the caribou sport hunt, carried out through outfitting camps, creates hundreds of jobs and generates more than $10 million per year. The employment and revenues flowing from sport hunting in Labrador are in the range of dozens of jobs and about $1.5 million, respectively, in 1993. In Quebec, sport hunting is a growing industry, with additional outfitting camps being established every year. The mobile camp, as well as the permanent camp, is a feature of Quebec outfitting.

The Newfoundland and Labrador government feels that there is little conflict between the Project and the current state and future potential of tourism and outfitting, given the location of outfitter camps, the size of the training area and the DND avoidance program. In terms of future development, the province has identified the coastal areas of Labrador, in particular the north coast, for new non-consumptive activity. The infrastructure is there in terms of airstrips, hotels and historic and cultural sites. On the other hand, potential for lodge development in the interior is thought to be limited. In the province's opinion, the 2.5-NM avoidance plan is more than adequate, and 1 NM will not pose any problems for any new properties that may be approved. Furthermore, it is anticipated that most sites will be located outside the low-level flying areas. The panel was told that DND and the provincial government will consult with each other so as to avoid potential conflict between new developments and military activities. Implications that new developments may have on the military training program will be considered in assessing future Crown land requests.

DND agrees that outfitting and other tourist activities generate an important seasonal source of employment and significant expenditures in the local economy. In terms of the Project, DND indicated that there are approximately 35 camps located within or close to the low-level training areas. It is estimated that 500 people may occupy these camps at any one time. Because of their location and the fact that they operate during the summer months, their exposure is high — the estimated range, at 18 000 sorties, is between one overflight a month up to four a day. Camps in central Labrador will experience the greatest disturbance from overflights.

The panel concludes from its questioning of outfitters during the hearings that low-level flying activities have negligible to limited impact on their industry. Outfitters said that the avoidance measures operated by DND provided the necessary space, and there had been no negative impact on their existing operations.

DND reported that non-consumptive adventure tourism in the study area is at an early stage of development. It is mostly organized from central Labrador or along the Quebec Lower North Shore. The opening of the Trans Labrador highway has created opportunities for non-consumptive activities that were not there previously.

Given the Newfoundland and Labrador government's statement that future development of tourism in Labrador will be primarily in non-consumptive adventure tourism and that DND's proposed future avoidance criteria would provide avoidance for these activities only "when operationally feasible," the panel believes that the effect of this approach may not have been closely examined as to its

potential impact on the future growth of this sector in the vicinity of the low-level training area.

18. **The panel recommends that the avoidance criteria for future non-consumptive adventure tourism within the low-level training area be reviewed on a case-by-case basis as the industry develops and that alternatives be considered for the avoidance of such activities as necessity requires.**

The panel was told that some of the aboriginal groups who did not participate in the hearings may have an interest in adventure tourism. Accordingly, there is a possibility that more interest exists in the future development of adventure tourism in Quebec and Labrador, especially within the low-level training areas, than was apparent during the review process. This fact should be considered when the avoidance measures are reviewed in future years and while evaluating the effectiveness of avoidance on adventure tourism activities.

Additional factors influencing the future of adventure tourism in Labrador could be associated with both the Trans Labrador highway and low-level training activities. The latter has been seen to provide increased exposure of the Labrador tourism industry in Europe through the Allied Forces training in Happy Valley-Goose Bay. Increased adventure tourism activities will also develop along the Trans Labrador highway as the conditions of the road improve.

The panel supports DND's commitment to fly across the Trans Labrador highway only, rather than down the path of the highway. The panel has also made a recommendation (#35), in Chapter 7, that reinforces DND's commitment not to fly along the Churchill River valley, where many resource users can be found, but rather to fly across it only.

5.0 SOCIAL IMPACTS

5.1 In-Town/Regional Impacts

5.1.1 Infrastructure and Services

During the hearings, some concerns were heard regarding Happy Valley-Goose Bay's infrastructure in terms of the ability of the sewage and water treatment facilities and health care services to meet current and future needs.

DND indicated that the existing water system, designed to serve a population of 9600, is at capacity, and the municipality acknowledges that modifications will have to be put in place before the maximum number of sorties is reached. The Town has installed a temporary system to alleviate water shortages, and further upgrades are being studied to eliminate any future problems.

In terms of sewage treatment, DND stated that the additional sewage load resulting from an expanded flying program will exacerbate peak flow problems and, without remedial action, will aggravate pollution at the outfalls into the Churchill River. Studies are ongoing to determine volumes of sewage and levels of contamination. CFB Goose Bay has provided financial support for the current study, and a cost-sharing agreement to develop a sewage treatment plant should be negotiated in due course.

DND sees the expanded project as having a minor impact on health services. More specifically, the expected impact on the Melville Hospital is negligible because military personnel rarely use the hospital (17 admissions per year, for an average stay of 2.5 days). The Newfoundland and Labrador Department of Health said that the government is committed to building a new hospital in Happy Valley-Goose Bay, that would be separate from the military hospital. The new hospital will be located off the Base and in an area where noise impacts will be minimized (see Chapter 6).

DND stated that the integrated high school on CFB Goose Bay is already at capacity and that a minor increase is expected as a result of the Project's expansion. With or without the Project, the schools on CFB Goose Bay need structural renovations. The impact of noise on schools in Spruce Park is also discussed in Chapter 6.

Environment Canada has reviewed a draft of the Hazardous Materials Management Plan and the feasibility study that addresses sewage treatment needs for the Happy Valley-Goose Bay area including CFB Goose Bay, and the department is satisfied with DND's initiatives. Environment Canada will continue to support DND in its development of pollution controls and strategies.

The panel concludes that all infrastructure and service issues are being dealt with and that project expansion will not cause significant problems in the future. The panel encourages more formalized and regular discussion of infrastructure issues and planning among DND, other federal agencies, the province and the Town of Happy Valley-Goose Bay.

5.1.2 Housing

The submission from the Government of Newfoundland and Labrador noted that the housing market is heavily influenced by military activities. The province thinks that there could be a strain on housing, because an increase in military personnel for training would mean that civilians would have to give up housing on the Base to the military. With a vacancy rate of less than 1%, Happy Valley-Goose Bay already experiences a high demand for housing.

The Melville Native Housing Association (MNHA) stressed the need for adequate and affordable housing for aboriginal people. The MNHA has 80 applicants waiting for quality housing. Furthermore, the MNHA will receive no further financial assistance through Canadian Mortgage and Housing Corporation's recently cancelled Urban Native Housing Program. The MNHA was particularly concerned because, as was noted above, there is likely to be a displacement of civilians currently occupying Base housing, which will cause an increase in demand for civilian housing.

In the information presented by DND, it was noted that the Project will generate a modest demand for married quarters on the Base. The Royal Air Force may also require an increased number of married quarters as a result of personnel restructuring. There will be pressure from DND to reclaim a number of housing units that are currently rented to civilians. These people will have to seek alternative housing.

The panel feels that appropriate long-range planning involving DND, the municipality, housing agencies and developers should take place. In particular, the panel recognizes that housing for aboriginal peoples in Happy Valley-Goose Bay is of concern.

19. **The panel recommends that DND continue to work closely with the Town of Happy Valley-Goose Bay, the Newfoundland and Labrador Housing Corporation (NLHC) and the Melville Native Housing Association (MNHA) in monitoring housing demand.**

20. **The panel recommends that DND ensure that timely information is received by those affected regarding its plans to displace civilians from Base housing.**

5.1.3 General Social Concerns

Concerns were raised about a number of general social issues and problems and their possible relationship to the Project. Among these were abuse of women, sexually transmitted diseases, prostitution, provision of social services, alcohol abuse and general social disruption resulting from the Project.

The Newfoundland and Labrador Department of Social Services outlined the various social services available to people in the region. In terms of the suggested link between the military and abuse of women, the department noted that the services of Libra House, a home for abused women, are

largely underutilized, with fewer than 800 women having used the service in its nine-year history. Use of this service by military families is very low, with only three recorded cases during this same period of time. The department also reported that CFB Goose Bay has developed the Family Resource Centre for DND employees and dependents. In general, the department feels that the town is thriving and growing largely as a result of the employment generated by CFB Goose Bay, and, as previously noted in Chapter 4, government transfers or social assistance levels in Happy Valley-Goose Bay are quite low compared with those in communities of similar size elsewhere in the province.

During the hearings, the panel heard that current health services for the Goose Bay area are provided by the administration of Grenfell Regional Health Services, with headquarters in St. Anthony. The Health Services Board is being reorganized, with a Northern and Western Labrador Health Services Board being located in Happy Valley-Goose Bay. There has been a military representative on the Board of Directors of the Melville Hospital, and the hospital has enjoyed a very co-operative relationship with the military.

In terms of the health impacts of the Project, the Newfoundland and Labrador Department of Health reported that the data provided thus far on health impacts are limited because they are dealing with such a small population, and, as a result, comparisons and firm conclusions are difficult.

The Newfoundland and Labrador Department of Health reported that the proportion of deaths due to accidents, poisonings and violence is three times higher in Labrador's aboriginal communities than in the Canadian population in general. The incidence of family violence is comparable to that in the rest of northern Canada. The contrast in the health status between central and northern Labrador communities relates more to the poorer living and social conditions in the coastal communities than to any military-related activity in Goose Bay or in the flight zones. In general, the health and social problems seen in the area are similar to those described in other aboriginal populations in Canada where there are no military flight training activities.

The provincial brief also stated that improvements in the health status of aboriginal people in northern Labrador communities will depend on improvements in social and lifestyle conditions, rather than on changes in the Project. The Newfoundland and Labrador Department of Health concluded that if low-level flying has any negative effects, these would have been seen primarily in the Happy Valley-Goose Bay region. The health status of this population compares favourably with that of other communities in Newfoundland and Labrador.

Alcohol abuse is a major health problem throughout the region. Although the aboriginal alcohol abuse rates are higher than in the general population, this situation is similar to health and social conditions in other aboriginal communities in northern Canada. The Newfoundland and Labrador Departments of Health and Social Services both concluded that alcohol problems would rise if CFB Goose Bay did not exist. Military training activities have provided the foundation for the sound economic development of Labrador and the basis for further enhancement of health services within the region.

The province wrote that it was not aware of any significant social or health problems that could be attributed to military training activity. The incidence of social problems like family violence and abuse is no greater in this area than it is in other parts of Canada's North. Furthermore, there is no evidence concerning increased sexual assault, prostitution or incidence of sexually transmitted diseases.

DND responded to concerns about various social issues by reporting the results of its local consultation. It showed that most people felt that the region's social problems had more to do with unemployment, the lack of opportunity and northern isolation than with CFB Goose Bay and the Project. DND concluded that links between the Project and concerns about sexual assault and sexually transmitted diseases are tenuous at best and that no increase in these problems could be attributed to the Project.

The panel concluded that there was no direct link established between the Project and the health and social problems of the region. Nevertheless, the panel does not feel that these issues should be ignored. Of particular concern is the fact that, as in other aboriginal communities of Canada, a large proportion of the population is under 25 years of age. This may increase stress upon all social and health agencies as the demands for education, training and jobs increase.

The panel encourages social service agencies and related government bodies to set up a working group with DND (Family Resource Centre) to observe problems of a social nature (e.g. housing, family violence, needs of a largely young population, alcohol abuse, etc.) closely and to develop strategies and plans to meet future needs.

5.1.4 Base-Region Relations

Some people who appeared before the panel said that racial tension exists in Happy Valley-Goose Bay and throughout the region. A member of the LIA told the panel that racism and prejudice have existed in the area for many years. They became more significant in Happy Valley-Goose Bay in the 1960s when Inuit were coming in from the coast and a special area was established for them away from the main population. Concern was expressed about an increase in racism after the hearings, regardless of the environmental review's conclusion.

The Town of Happy Valley-Goose Bay claimed that it does not see widespread racial tensions in the community being caused by the presence of military flight training.

The panel believes that social tension and racism exist in the area. Much of the tension arises from anxiety regarding employment because of the Project's uncertain future and the absence of land claims settlements. The speedy resolution of these two issues would be beneficial to all. The panel also recognizes that these kinds of problems are found in communities throughout Canada and that racism would likely exist whether the Base was there or not. Part of the problem lies in the exclusion of aboriginal groups from the decision-making process. The panel feels that this problem can be addressed through the

participation of aboriginal groups in the proposed Institute, discussed in Chapters 2 and Chapter 11, and in the proposed George River Caribou Herd Management Board. When aboriginals feel they are involved in the decisions that affect them, their distrust of government will decrease and teamwork will gradually take hold. Constructive communication between the various groups can only help to relieve tension in the area.

In order to promote better communication and interracial respect between its staff and Allied personnel and the aboriginals in the area, DND has made courses available to sensitize employees to the aboriginal reality. Although formal mechanisms such as the Institute and the Caribou Herd Management Board are essential for developing mutual respect between aboriginals and non-aboriginals, the less formal, daily interactions of the two groups are no less important.

Presently, some government departments and agencies require their personnel working in Labrador to take cross-cultural awareness training. **The panel encourages other organizations and businesses in the region to offer similar initiatives.**

21. The panel recommends that DND conduct cross-cultural awareness training for all incoming Canadian Forces, DND civilian employees and Allied Forces.

There were many comments during the hearings that the general public was largely unaware of the roles of the Native Liaison Officer and the Community Liaison Officer and that the toll-free numbers were not being used for avoidance. **The panel concluded that the communication role of these positions has not met with any great success. This issue is discussed further in Chapter 11.**

5.2 Land Use

5.2.1 Importance of Resource Harvesting

Although the EIS discusses the existence of the “old” and “new” economies on the Quebec-Labrador peninsula, it was during the public hearings that the panel gained an appreciation for how the peoples of the area have integrated these economies to survive. Each community provided its own particular blend of the two, based on the distribution of natural resources and the availability of wage employment opportunities.

The panel found that few people believed that a purely traditional way of life could be sustained today. The cost of harvesting the natural resources on the land, especially the purchasing and maintenance of modern-day equipment, was seen as a limiting factor. Each individual was forced to create a balance between the acquisition of resources through harvesting and the acquisition of income through wage employment, transfer payments, etc.

For the coastal communities, where wage employment opportunities are few, the panel found that the dependence on resource harvesting is very strong. Fishing provided both income and an important part of the diet for these communities. The panel also heard that caribou was extremely important in the northern coastal communities as a source of food. Southern communities were more involved in trapping and the income it generates. The harvesting process and the sharing of country foods are culturally important to the coastal communities.

In western Labrador communities, the panel heard from people who were less dependent on the harvesting of resources owing to greater opportunities for wage employment. As a result, activities on the land tend to be more of a recreational nature. This is not to say that resource harvesting does not contribute substantially to the household foods eaten, just that there are other foodstuffs readily available, along with the income to purchase them.

The testimony of the central Labrador communities showed a dependence on resource harvesting that was intermediate between that of the above two regions. For many, there was still a dependence on the harvesting of resources, despite the wage employment opportunities. The panel heard that harvesting in this region, as in western Labrador, was closely tied to the availability of easy access routes onto the land. Indeed, as a result of the Trans Labrador highway, resource harvesting has increased and expanded into areas previously frequented only by some of the more active harvesters, including the Innu.

Resource harvesting on the Lower North Shore of Quebec varied depending on the sector being examined. The central and eastern communities were described as carrying out considerable resource harvesting and land use activities, whereas the western portion of the region depended to a lesser extent on such activities. The panel received information on the cultural importance of resource harvesting and land use activities among the Montagnais of the region.

As demonstrated, the resource harvesting and land use activities are an integral part of the way of life in the region. DND did not try to calculate an economic value for these activities, as the data necessary for such an analysis were said to be unavailable. This was especially true for Innu, Montagnais and, to a lesser extent, Inuit populations, as there is significant cultural and religious importance associated with the use of the land that is unquantifiable in monetary terms.

DND estimated that there were about 3000 individuals conducting harvesting in the region. Of these, between 350 and 600 harvest within the boundaries of the low-level training area, depending on the mitigative option selected. No specific data were presented during the hearings that showed trends in resource harvesting and land use activities by aboriginal groups. In general, DND concluded that most of the harvesting, with the exception of big game, takes place in close proximity to the communities and largely outside the low-level training areas. For the Option "B" configuration, DND sees some potential impacts on community resource harvesting in central Labrador falling on the communities of Happy Valley-Goose Bay, Sheshatshit, North West River and Mud Lake. In northern Labrador, the coastal communities will be less affected.

In western Labrador, DND stated that impacts will be felt by harvesters from the community of Churchill Falls, as a high percentage (85%) of their harvesting will be carried out within the proposed reconfigured area. On the Quebec Lower North Shore, the harvesters from the communities of Natashquan/Aguanish, La Romaine and St. Augustin may all have their harvesting impacted upon to some degree, although the southern boundary of the proposed training area will be about 60 km away from these communities.

During the hearings, the panel heard from many harvesters in this area who do not depend on resource harvesting for their survival and who do not perceive any impacts to be associated with low-level flight training. The panel feels that the importance of resource harvesting to the aboriginal peoples of the Project area and surrounding communities cannot be downplayed. Resource harvesting and land use activities remain an integral part of the way of life in the region, not only on an economic level, but also on a social, cultural and religious level.

The panel tried to get good information on the numbers of people carrying out harvesting on the land and, more specifically, within the low-level training area. DND did provide rough figures from the data collected for the EIS, but the uncertainty associated with the figures was high. In addition, the numbers presented did not include any data on the Innu and Montagnais harvest and land use activities. Neither the Department of Indian Affairs and Northern Development, which finances, nor the Newfoundland and Labrador government, which administers the "Outpost Program," could give firm figures on users, despite increasing budgets for the program.

The times of the year in which resource harvesting and land use activities are conducted were presented both in the EIS and during the public hearings. The panel finds that it is clearly evident that the lengthening of the flying season considerably increases the likelihood of individuals on the land being overflown. This will, of course, depend on the level of low-level flying activity during the months of March and November. Again, the number of individuals to be potentially impacted is uncertain.

The panel concludes that there is not enough information on the impacts of the Project on aboriginal and non-aboriginal resource harvesting.

22. The panel recommends that the Institute undertake studies to determine the extent of resource harvesting activity on the land and the impact that low-level flying may have on aboriginal and non-aboriginal resource harvesting.

52.2 Impacts on the Innu and the Montagnais

DND realizes that Innu, whether they are on the land or in their communities, are concerned and impacted by the Project because of their relationship to the land. Their "quality of life" has been adversely affected by low-level flying in areas where they have established their camps and where they use the land. The Innu feel less secure when they travel out on the land because of a fear of low-flying jets. They indicated that a deterioration of their quality of life in the past has had consequences on their economy and their health. The Innu also feel alienated and frustrated because their land claim is not settled and feel that they have no influence on how the Project is carried out.

There are overlaps between Project activities and Innu land use. It is critical to note that camp site locations tend to coincide with preferred flight paths — in the river valleys and along principal water courses. It is worst for Sheshatshit, La Romaine and Natashquan — more than 50% of the land accessed by these communities is often exposed to Project activities. The Project may cause some Innu to abandon the most exposed camp sites, return to their community or change the time they go into the bush. This, in turn, could affect the social dynamics of the community — particularly the system of exchange that is inherent to the Innu system of land tenure and the success of their harvesting activities.

DND noted that, despite the Project, there is some evidence that the amount of harvesting has increased in the 1980s (e.g. the number of trappers in the communities of Mingan, Natashquan, La Romaine and St. Augustin rose from 118 in 1981 to 330 in 1987). The "Outpost Program" has allowed increased access to the country, which also changes the nature of harvesting. DND also looked at demographics in terms of the impact on the "sustainability" of the resource base used for community harvesting. The Innu population has increased substantially since 1971 (e.g. Sheshatshit up by 74%, Utshimassit up by 140%). This growth influences who harvests and where they harvest and should therefore be taken into account when discussing harvesting patterns and considering the sustainability of the resource base.

In terms of Innu and Montagnais country-based harvesting, the most affected are La Romaine, Natashquan and Sheshatshit (especially Natashquan and La Romaine because of the greater importance placed on the income gained from trapping). For Sheshatshit, there are impacts on the caribou hunt, small-game hunting and fishing.

DND noted that harvesting activities contribute to the physical and psychological health of the harvesters, provide opportunities for the transmission of knowledge about the land and its resources from elders to the younger generations and provide for family and community interaction. Their role is economically and culturally significant.

DND has conceded that the Project cannot provide the employment many seek in the new economy and that it may be an unwanted intrusion over the land to those who are in the country, but DND claims it poses little or no threat to their search for a better future. Increasing numbers harvest irrespective of the Project. DND believes that, for those from Sheshatshit who wish to be involved in the new economy in central Labrador, the opportunities are greater with the Project than without it. Furthermore, the termination of low-level flying would not resolve the dilemmas and problems confronting the Innu people and might in fact make the situation for those from Sheshatshit more difficult.

DND does not question the value attributed to the land by Innu people. Their use of the land is susceptible to change, but

many factors are involved — demographic growth, the reclaiming of responsibility for their own way of life and their determination to settle their land claims successfully, all of which will alter their way of life.

DND determined that there will be an increased impact on the activities of the Innu community of Sheshatshit should the Project shift to Option "B." The fact that much of Innu tradition and culture is inextricably linked to resource harvesting and land use activities makes the Innu especially sensitive to projects that might impact on these activities.

The panel was told that there are other activities in the region that have contributed to the cumulative impact on Innu tradition and culture. The construction of the Smallwood Reservoir caused the Innu of Sheshatshit to relocate some of their land use activities to new areas. The construction of the Trans Labrador highway is creating increased harvesting pressure on traditional Innu lands, perhaps ultimately forcing the relocation of Innu land use once again. With low-level flying exercises encroaching on their lands, there is little wonder that Innu people feel so strongly against the Project.

The control over the land, an integral part of the notion of "territorial integrity," is no longer perceived to be in the hands of the Innu, as their traditional culture and religion require. The Innu claim that they cannot escape the pressures of their new community life and return to the land to cleanse and renew their beliefs without being overflown by fighter aircraft. The fear of being overflown and the noise from the jets have been reported to prevent Innu from returning to the land, the consequences of which are discussed in Chapter 6.

Unfortunately, the panel did not receive conclusive evidence about the real impact of low-level flying on the numbers of Innu going out on the land and on the success of their harvest activities. The material submitted on Innu land use made the panel aware that there is a need to reduce the conflict between Innu land use and low-level flying. Part of the answer may lie in the successful negotiation of the Innu comprehensive land claim. Another part is the successful inclusion of Innu opinions into the management process of low-level flying and the associated mitigative measures. This can be accomplished only by the full participation of the Innu in the Institute.

A similar case exists for the Montagnais bands represented by the CAM. Although more distant from the Project area, Montagnais land use does extend into the low-level training area. Montagnais culture is similar to Innu culture and religious beliefs, in that it has important links to the land. Again, the panel views the settlement of the CAM comprehensive land claim as being an important step towards obtaining the involvement of the Montagnais in the planning of future low-level flying activities. The panel also strongly encourages their involvement in the proposed Institute.

5.2.3 Competition for Wildlife Resources

Concern was expressed during the course of the review that DND and Allied personnel increased the pressure on wildlife resources in the Project area. A specific concern was raised during the hearings about DND's use of No Name Lake. As well, questions were raised about foreign military hunting and fishing rights and use of guides.

DND reported that No Name Lake is a site that the department has leased for many years. It was originally built by the United States Air Force; when the air force left, DND took over its operation. It is now used as a wilderness fishing camp for military and civilian personnel from CFB Goose Bay and their dependents. Everyone pays his or her own way, as no public funds pay for the camp's operation. People at the camp fish and hunt under licence and use guides licensed by the province.

The panel viewed this issue as one of wildlife management and not part of the mandate of the review process. Representatives of the Government of Newfoundland and Labrador stated that all provincial rules and regulations were being applied to the personnel associated with the low-level flying project.

It is evident from the data presented to the panel that greater pressure is being placed on the wildlife resources in central Labrador than elsewhere in the region. Apparently, this is from both an increase in the population of the area and the construction of the Trans Labrador highway. As mentioned above, the Trans Labrador highway has enabled increased access to areas previously harvested by only the more active harvesters and the Innu. This has considerably changed the harvesting patterns in and around the community of Happy Valley-Goose Bay.

5.2.4 Parks and Reserves

Within the Project area, there are a number of proposed parks or reserves. Of these, the Lac Joseph Reserve was discussed most frequently during the public hearings. DND did not commit itself to any special mitigative measures for any parks, reserves or International Biological Programme sites, as none has been formally established. DND also felt that it should have priority rights over any of these proposed developments, as the low-level training areas would have been formally established first.

The Newfoundland and Labrador government takes the point of view that, by including DND in the province's assessment process for the development of Crown lands, potential conflicts can be resolved. The provincial government was also of the opinion that the avoidance measures currently in place already provide a degree of protection to many of the wildlife species and areas in question.

No submission was made from the Quebec government on this topic. There is currently one park proposed to be established within the Quebec southern portion of the low-level training area.

The panel does not agree with DND's claim that, with regard to the establishment of parks and reserves, DND has priority rights over the low-level training areas.

23. The panel recommends that decisions and mitigative measures on proposed parks or reserves be formalized in the future, so as to ensure the protection of the natural environment and human activity within the parks and reserves.

6.0 HEALTH IMPACTS

6.1 Fuel Management

Many concerns were raised in written submissions and during the hearings about fuel management on CFB Goose Bay and during aircraft emergency situations that require fuel dumping or the jettisoning of fuel tanks while airborne.

Hydrazine, a toxic fuel carried aboard F-16 aircraft, was of particular concern. DND stated that if an F-l 6 aircraft crashes, either the hydrazine tank will remain intact and be recovered or the tank will break on impact and the fuel will evaporate quickly. In the latter situation, the small quantity of fuel released, a maximum of 73 litres, will be minimal relative to the amounts of other contaminants at the crash site.

On-base storage and the possible release of hydrazine on the ground are also of concern. Special storage and handling procedures for response to inadvertent firing of F-16 emergency power units are in place at CFB Goose Bay. DND has concluded that the use of hydrazine for F-16 aircraft does not present a risk to people, the environment or wildlife.

When DND assumed control of the Base in 1988, seepage of about 4.5 million litres of fuel from the fuel tank farm was identified as a problem, and action was taken by DND to resolve it. DND reported that, since 1992, six of the large above-ground fuel storage tanks have been upgraded with impermeable dikes. with the remainder to be completed no later than 1997.

Environment Canada expressed concern about the shipment and delivery of fuel. Its concerns centred upon ensuring that there is a timely and effective response to accidents during transport and delivery of fuel to CFB Goose Bay. DND reported that a contingency plan has been developed for fuel spills in water and that an inventory of hazardous materials has been developed.

The panel is satisfied with DND's response to fuel problems on CFB Goose Bay and feels that those government departments and agencies with responsibility in these areas should exercise their authority to prevent future problems.

6.1.1 Airborne Fuel Releases

Throughout the review process, participants raised concerns about fuel dumping and the effects on human health, wildlife and vegetation. Compensation for those affected by fuel dumping or the release of a fuel tank in flight was also an issue raised during the hearings.

Occasionally, emergency situations may make it necessary to jettison aircraft fuel tanks. The tanks will normally break up on ground impact, and fuel will be released. DND's "Environmental Action Plan" describes the procedure for removal of jettisoned tanks and/or fuel spills. DND reported that, over the last three flying seasons, there has been only one incident of fuel tanks being jettisoned at Goose Bay. Should a tank cause damage on impact, compensation is available from DND through an established claims procedure.

Fuel dumping is a more common occurrence, but the number of emergency occurrences that require fuel to be released is still very small as a percentage of total flights. For example, there were 16 fuel dumps in 1992 out of some 7000 flights associated with the low-level training program. DND designates three areas within 30 km of Goose Bay (see Figure 4) where aircraft are directed during an in-flight emergency to release surplus fuel. Normally, the fuel will be released at about 2000 feet altitude; depending on the quantity of fuel released, the speed of the aircraft and the wind speed and direction in the area, the fuel will be spread over a wide area and will largely evaporate during the fall to the ground. Modelling done by DND suggests that between 3 and 28% of the fuel will reach the ground, depending upon the altitude of release, wind velocity and quantities released.

Although Environment Canada agrees with DND's conclusion that dispersion of aviation fuel over a wide area during emergency events should not result in significant environmental effects, the department feels that incidents involving jettisoned fuel tanks that rupture on impact have not been fully addressed.

The panel concludes that, although it received no conclusive evidence that fuel dumping from the Project has had significant health impacts, there is considerable public concern on this matter. Further monitoring of the impacts of fuel dumping should be a priority for the proposed Institute. If any impacts are determined, then the issue should be referred to the responsible organization for action.

24. **The panel recommends that DND advise regulatory agencies of the map co-ordinates of all future fuel dumping incidents.**

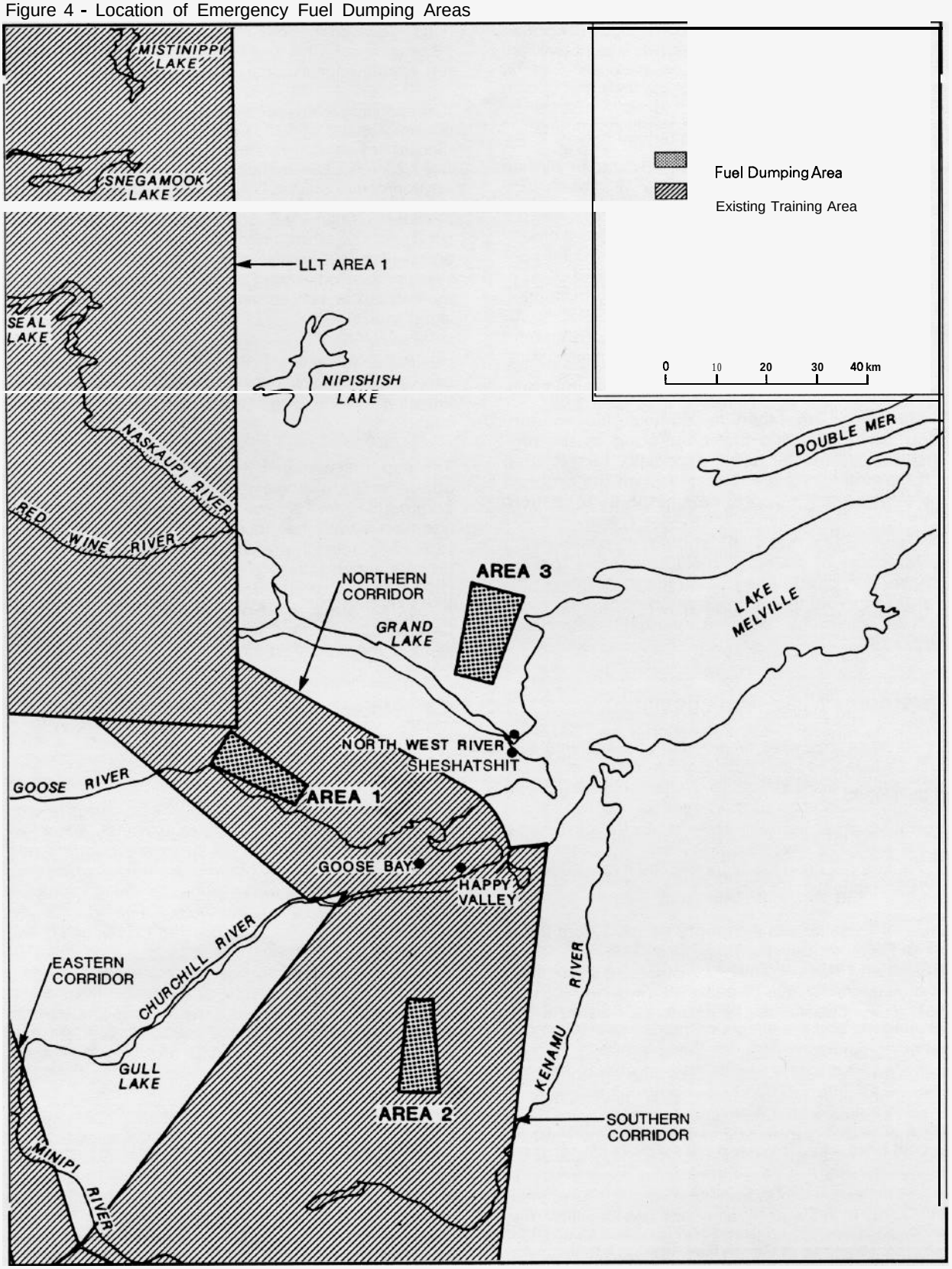
25. **The panel recommends that the study of hydrocarbon concentrations in fuel dumping areas include the behaviour of petroleum hydrocarbons in aquatic systems.**

6.2 Air Quality

Significant concerns were raised regarding the impact of low-flying jet exhaust on the air quality within the training areas and around CFB Goose Bay. A particular concern was raised about the effect on the food chain (discussed in more detail in Section 7.5). The Government of Newfoundland and Labrador and Environment Canada also expressed concern about nitrogen dioxide levels.

To determine air quality impacts, DND first considered the quantity and type of releases of contaminants (mainly carbon monoxide) by jets per hour of flying time and then multiplied the quantity of contaminants released by the numbers of hours of flying time — 18 000 hours. Models were then run to determine what happens to the gases. It was determined that

Figure 4 - Location of Emergency Fuel Dumping Areas



some fall to the ground but that there would be no significant change in water, air or soil quality. The DND study concluded that the biggest problem in terms of air quality was not military flying, but instead acid rain from sources in central Canada and the United States. Environment Canada feels that carbon monoxide is not a concern because its levels would still be below safety levels even with an expanded flying program.

Environment Canada found that although nitrogen dioxide concentrations, monitored by DND in the vicinity of CFB Goose Bay, did not exceed maximum acceptable levels according to the National Ambient Air Quality Objectives, modelling shows that these levels may be surpassed during poor dispersion conditions and when flights are at a maximum. Environment Canada believes that the air quality monitoring program proposed by DND should help verify predicted increases in nitrogen dioxide concentrations. Environment Canada has offered to support this program and help interpret the results.

The panel recognizes that there are some significant concerns about air quality and that monitoring by the proposed Institute should be done, especially for nitrogen dioxide. If harmful levels are detected, then the problem should be referred to the appropriate authority for action.

The panel concludes that DND should consider using real-time forecasts of meteorological conditions that influence dispersion conditions to plan the daily flying program in order to avoid those times when poor dispersion may result in acceptable ambient air quality objectives being surpassed.

6.3 Hazardous Waste Management

Some general concerns were raised about the management of hazardous waste and other hazardous materials related to the Project. Environment Canada's written presentation, in particular, suggested that further attention to hazardous materials management was warranted given the past waste management problems reported in the EIS. Concerns were also raised during the hearings regarding the management of polychlorinated biphenyls (PCBs).

In response, DND stated that it currently has 900 kg of PCBs stored on CFB Goose Bay from past use. The Base is not currently using any PCBs. If any more PCBs are discovered, DND has a hazardous waste disposal area where the PCBs can be held until a decision is made as to their disposal.

Environment Canada recognized that the Base has been in operation for over 50 years, and much of the environmental damage occurred prior to DND taking over management in 1988. In consultation with Environment Canada, DND has developed a remedial plan to address many of the environmental problems it inherited at the Base. DND has made great strides in identifying areas of environmental concern and in implementing mitigative and monitoring measures. The "Environmental Action Plan" is an example of DND's initiative in this area. Environment Canada is pleased with these initiatives and will continue to support DND in its development of pollution controls and strategies. Environment Canada is committed to ongoing consultation with DND and to conducting inspections of CFB Goose Bay to ensure compliance with regulations administered by the department.

In responding to environmental concerns, DND stated that it is currently spending $30 000 a day on environmental issues at Goose Bay. It also has the largest environmental budget of any air force base in the country and is the first base with an environmental officer. DND stressed that it showed environmental responsibility upon assuming control of the airfield by conducting an environmental baseline study and producing an action plan that identified environmental problems. Although these problems were not created by DND, a five-year environmental plan was developed that could cost DND $32 million to implement.

Health Canada accepts DND's Environmental Action Plan and sees no problems with its waste management plan in terms of ensuring safe drinking water and control of hazardous waste sites.

The panel is satisfied with DND's response to concerns about hazardous waste management. DND should be commended for its proactive approach to the waste management problems, most of which it inherited when it took over operation of the Base. Although the panel has no recommendation to make in this area, it encourages DND to continue its proactive approach to these issues. Agencies such as Environment Canada and Health Canada should continue to monitor the situation as part of their regulatory roles.

6.4 Noise

6.4.1 Noise Measurements

The amplitude of sound or its "loudness" is expressed in decibels (dB), a numerical scale that indicates a level of sound power. There are several decibel scales, but the most commonly used is the A-weighted scale (dBA), which mimics the characteristic human ear response to sound intensity. On this scale, everyday sounds normally range from a very quiet 30 dBA to a very loud 100 dBA. Normal speech between two people about 2 m apart creates a sound level of about 65 dBA. In general, a 10-dBA decrease makes a sound seem half as loud as it did before. Conversely, a 10-dBA increase will make the sound appear to be twice as loud as before. For example, a diesel truck with a sound level of 90 dBA may be perceived to be twice as loud as an alarm clock with a noise level of 80 dBA.

There are different methods of measuring noise, Noise can be considered in terms of the maximum noise level reached during a noise event. For example, during an overflight, the maximum noise intensity or "loudest" noise occurs when the aircraft is directly overhead. This kind of measurement, often referred to as the "maximum sound level (L_{max})," is usually considered in relation to such activities as speech interference or sleep disturbance.

Noise is also considered in terms of its cumulative impact over a period of time — for example, the noise from frequent takeoffs and landings at an airport. The "equivalent sound level (L_{eq})" measures the level of continuous, steady noise that would, over a given time, contain the same acoustic energy as a series of single noise events plus the background noise. This measurement is useful in relation to such factors' as community annoyance levels and hearing loss over time. It can be measured for any period of time, such as 15 minutes. 1 hour or 24 hours.

Noise around airports is most often quantified in terms of the cumulative noise contours. The most widely used measurements in Canada are Noise Exposure Forecast (NEF) contours. They are produced by computer modelling that considers such factors as aircraft types and runway utilization and assumes the daily number of aircraft movements (single takeoffs or landings by individual aircraft) to be equal to that on a "peak planning day." It is important to note that, 95% of the time, the number of daily movements will be less than or the peak planning day.

Transport Canada guidelines provide that no urban development should take place inside the NEF 30 contour, although with appropriate noise insulation this can be extended to the NEF 35 contour. The Canadian Mortgage and Housing Corporation uses NEF 25 as a contour-value guideline for mortgage approval purposes.

6.4.2 Onset Rate and the Startle Effect

In terms of determining the impact of overflights, the rate at which noise increases and decreases (the "onset rate") during a fighter overflight depends primarily upon its altitude above ground level, its speed and the lateral distance between the flight path and the observer on the ground. The distance and direction of the noise are also determining factors. Increasing the lateral offset distance reduces the onset rate noise much the same as reducing aircraft speed and increasing the altitude above ground level would.

The onset rate is important for determining the degree of startle effect and disturbance to humans and wildlife from overflights. DND assumes that aircraft noise with a rise time or onset rate greater than 15 dBA/second is startling. To quantify the effect of the startle, onset corrections are usually made that can vary from 0 dBA for onset rates below 15 dBA/second to 11 dBA at onset rates of 150 dBA/second or greater.

The panel received comments about the use of these measurement techniques by DND and their value in terms of judging the health impacts of noise. Critics said that much of the information provided by DND did not include an estimate of the range of prediction uncertainty. DND should have accounted for more factors in considering the health impact of noise, including previous exposure history, previous behavioural and health status and interactions with other environmental variables. Critics stated that these factors are considered critical for the determination of Project impacts for groups, such as Innu, that spend a significant amount of time out on the land.

The panel noted these criticisms and recognizes the high degree of uncertainty involved in making any conclusive statements regarding the impacts of noise. At the same time, the panel recognizes that the primary impact of the Project on human health is noise.

6.4.3 Impacts on Health

The review process produced much expert and public opinion on the health impacts of noise. There was a good deal of theoretical and hypothetical basis for concerns about health impacts due to noise, but much of this information was conflicting and/or inconclusive. The panel found noise and its health effects to be one of the most difficult, complex and uncertain aspects of the Project. This uncertainty meant that the panel relied heavily on the testimony of those personally affected by the noise, whether in the vicinity of the airport or out on the land.

The impacts of noise can generally be broken down into two distinct areas: impacts on people in the vicinity of the airport and impacts on people out on the land. The basic distinction between the two is that people in the vicinity of the airport are impacted by the regular operation of the airport, whereas people on the land are more likely to be impacted by the occasional overflight.

6.4.3.1 **Impacts in the Vicinity of the Airport**

Discussion of the impacts of noise near the airport focussed on the community of Spruce Park (located beside the airport, with a population of over 900 people) and the effects of takeoff and landing noise. It was felt by some participants that the noise levels in and around Spruce Park represented a greater concern than those on the land. The impacts considered were annoyance, activity disturbance, effects on blood pressure, effects on hearing, effects on pregnant women and unborn children and effects on learning and child development.

DND also identified Spruce Park as having "by far the greatest potential for any adverse effects." In a future peak year, Spruce Park residents will be exposed to NEFs ranging from 36 to 46, whereas residences on CFB Goose Bay, in Hamilton Heights and elsewhere will all be outside the NEF 35 contour.

a) Annoyance

Annoyance from noise is difficult to determine because it usually will depend on a person's attitude towards the source of the noise. As one expert said, the people of Spruce Park are less likely to be annoyed than people on the land, because many of them enjoy benefits from the Project (e.g. jobs), whereas many of those on the land do not. For this reason, the level of annoyance experienced must be considered in terms of its relationship to the source of the noise. During the hearings, the panel heard from a few residents of Spruce Park who did not mind the noise.

In comparing the noise levels to those experienced in similar situations elsewhere, one expert concluded that the levels of annoyance in Spruce Park should be severe. With the increase in flights, DND has forecasted NEFs of 46. An expert

noted that these levels represent a high exposure in comparison to other populations studied.

A submission from the Government of Newfoundland and Labrador stated that concerns about loud jet noise, both at the aerodrome and in the training area, were largely unsubstantiated. The province believes that noise levels in Spruce Park, although annoying to some, will not cause hearing loss or other physical health effects. The province noted too that DND has restricted times for engine run-ups and takeoffs and has constructed a noise berm.

The province also noted that housing development restrictions are in place for high-noise areas in Happy Valley-Goose Bay. The municipal plan prohibits new housing in areas above the NEF 35 contour.

The panel urges the rigorous application of planning that prohibits housing development in the NEF 35 contour areas.

DND found that noise studies generally acknowledge that noise level is only one of many factors that, in combination with other irritants, determine the degree of annoyance experienced by a population exposed to noise. It was noted in information provided by DND that a 1988 social survey of Spruce Park residents indicated that 10% of residents considered themselves to be "highly annoyed," 27% were "moderately annoyed" and 35% considered themselves "slightly annoyed." DND added that annoyance could increase, as the NEF contour is expected to increase by 3 dBA in some areas of Spruce Park. DND concluded that the overall significance of annoyance in the immediate vicinity of the airport is moderate.

DND suggested that the situation in Goose Bay should be compared with that near airports in Toronto and Vancouver. Not only are there considerably more people living within the same NEF contours in Toronto and Vancouver, but those noise environments are undoubtedly more continuous than at Goose Bay. Furthermore, DND reported that, although aircraft movements in Goose Bay will result in higher maximum noise levels at certain times of the day, the Goose Bay situation is probably preferable, in that residents enjoy almost total relief from aircraft noise throughout a substantial part of the day and very limited activity during normal sleeping hours and during the winter.

Although surveys indicated significant annoyance levels in Spruce Park, the panel heard from residents who had no problems with the noise. The residents seem quite ready to put up with it for the sake of economic and social health. They said the noise is no problem: one gets used to it; it is the noise of money; it is the basis of their prosperity. **However, the panel concludes that annoyance from airport noise exists and is real.**

b) Disruption of Activities

In terms of noise disrupting activities such as sleep, one expert determined that it is probable that sleep is going to be disrupted for a significant fraction of the population in Spruce Park, especially considering the significant increase in the number of night flights. The noise from these flights can reach maximum levels (L_{max}) of more than 65 dBA (with windows closed) inside houses in Spruce Park. This is significant, given that the sleep disturbance level in the home is usually judged to be around 50 dBA (L_{max}). As a result, many people will have their sleep disrupted.

From its review of the scientific literature, DND concluded that it is very difficult to predict sleep disturbance accurately. Although night flights will increase in the future, this will be offset slightly by the noise berm reducing noise on runways **26** and **34.** DND pointed out that the majority of "night flights" will be conducted in the early spring and late summer months and will likely be carried out in the evening before most adults have gone to bed. However, there may be occasional night flights during mid-summer months when sleep disturbance could be a problem in Spruce Park. DND noted that young children living in Spruce Park who must sleep during the day will be exposed to more noise events, but this could be partially offset by the fact that children appear to be less sensitive to noise during sleep than are adults, by 10 dBA.

A DND survey of Spruce Park residents in 1988 found that 2% were frequently awakened by aircraft noise and 39% were sometimes awakened.

DND presumes that patients at Melville Hospital represent a particularly vulnerable group, because they sleep during the day. The hospital is currently located at the NEF 26 contour and will ultimately (in a future peak year) lie approximately on the NEF 29 contour. DND suggests that noise exposure levels will be much better for the new hospital (see Chapter 5, for reference to the hospital) in a new location.

DND stated in its documentation that, considering the noise levels that occur in Spruce Park, it is safe to assume that a significant amount of speech interference occurs during a large percentage of aircraft noise events. It concluded that the significance of speech interference within Spruce Park is moderate, with the most serious consequences likely to be in Spruce Park schools where teaching and learning could be adversely affected.

During the public hearings, the panel heard from a number of residents of the town who had no complaints about the noise and who raised "healthy" children in spite of the suggested impacts of noise.

The panel concludes that sleep disturbance may be a problem. Recommendation 6 relating to this has been made in Chapter 3.

c) Effects on Blood Pressure

In determining the effects of noise on blood pressure, DND and the experts noted that it was difficult to separate the influence of noise from other factors. Nevertheless, it was noted that adverse effects could be possible. Severe and sudden noise, such as the "startle effect," had an obvious short-term impact on blood pressure.

In their review of the literature, DND found a number of studies indicating a positive relationship between noise and blood

pressure (i.e. the studies indicated that the use of cardiovascular and antihypertensive drugs increased as noise exposure increased). At the same time, DND also concluded that there are many uncertainties (methodological problems, etc.) that prevent a hard and fast conclusion. Regardless, some risk must be acknowledged for the most highly exposed residents near Goose Bay (i.e. Spruce Park). However, considering that small increases in blood pressure, if they occur, do not necessarily represent a threat to long-term health, DND concluded that the significance of any adverse effects on blood pressure for Spruce Park residents is minor.

d) Effects on Hearing

Experts commented that information on the effects of the noise from the Project on hearing is inconclusive and that further study is required. Noise levels of 75-95 dBA associated with aircraft takeoff are predicted outside the houses and schools in Spruce Park. However, as the percentage of time during which the level of the noise exceeds 75 dBA is not known, it is difficult to predict the scope of the phenomenon of auditory fatigue.

The Town of Happy Valley-Goose Bay noted in its submission that DND has attempted to reduce noise levels with installation of the noise berm.

The Town Council of North West River noted that more hearing damage is likely caused by the use of shotguns, chain saws and snowmobiles.

Employees of the Base and their union indicated no incidents of hearing loss as a result of low-level flying as no problems have been reported.

An expert from Health Canada concluded from his review of the relevant literature that no significant hearing loss is likely to be experienced by the population near Goose Bay where the NEF exceeds 37, as the most extreme exposure in Spruce Park was estimated to be about L_{eq} 74 dBA. Furthermore, he stated that these levels could be reduced further if one were to consider that people are not outside all the time as the planes take off and land.

DND concluded that there would be no significant risk of hearing loss for residents living in the vicinity of the Goose Bay Airport. The general consensus from studies examined by DND was that a safe criterion for long-term noise exposure (L_{eq}) (i.e. 24 hours a day for many years) is 75 dBA. Although it has been estimated that the yearly L_{eq} in Spruce Park is 70-75 dBA outdoors, DND has assumed that the actual yearly levels of noise exposure will be less than 70 dBA, because residents will not, as Health Canada noted, spend all their time outdoors, and the noise berm will lower levels further. As the noise level in Spruce Park is less than 70 dBA, DND concludes that there will be no risk of hearing loss.

The panel agrees with the responsible government agencies and DND, and concludes that there is no significant risk of hearing loss for residents living near CFB Goose Bay. In reaching this conclusion, the panel notes that no one presented evidence linking the Project to hearing loss.

e) Effects on Pregnant Women and the Fetus

Some studies have shown a relationship between low infant weight at birth and exposure to aircraft noise. One expert stated that there is a strong probability of an association between exposure to noise and increased blood pressure of the mother and that it is logical to assume such an increase in blood pressure causes a reduction in both fetal blood flow and growth.

Most experts and DND found that studies on the effects of noise on the fetus have produced somewhat inconsistent results. Potential effects on the fetus appear limited to reduced birth weight without any increased risk of malformity. In this case, the population at risk would, once again, consist primarily of Spruce Park residents, whose noise exposures are relatively high; however, their noise exposures are well below the occupational noise exposures that were involved in some of the studies. DND concluded that the significance of potential effects on the fetus from aircraft noise is minor.

The expert from Health Canada concluded that there was no convincing information that aircraft noise in the Goose Bay Airport area causes an increase in the incidence of non-auditory illnesses such as cardiovascular diseases, mental or psychosomatic illnesses or adverse pregnancy outcomes. He said that few rigorous studies have been done in this area that prove otherwise. Although he acknowledged that some studies have indicated adverse effects of aircraft noise, these studies have had methodological flaws and inconsistent conclusions.

Although the information presented to the panel was inconclusive, the panel agrees with Health Canada and DND that if there are any effects, they are minor.

f) Effects of Noise on the School Environment in Spruce Park

Concern was raised from experts at the hearings and from the panel itself regarding the effects of noise on the schools in Spruce Park. These schools are currently located between NEF 35 and NEF 40 contours. According to Transport Canada guidelines, noise environments with NEFs above 35 are incompatible with the requirements of schools, even when the buildings are specially designed to mitigate aircraft noise.

There was a concern that listening and communication activities will be disturbed by Project-related noise. One expert stated that a noise level of 45 dBA requires persons to raise their voices. Maximum noise levels (L_{max}) in the Spruce Park schools are expected to peak in the 80-dBA range. This has significant implications in a learning environment.

It was concluded by some participants at the hearings that the greatest impact would likely be on young children during the speech and language acquisition phase and in learning situations. It is well-known that a temporary reduction in hearing ability as a result of intense noise can limit communication and delay speech and language acquisition.

It was noted during the hearings that noise levels cannot exceed 30 dBA in the classroom without interfering with verbal

communication. One expert noted that, in the Spruce Park Elementary School and the high school on the Base, noise levels exceed this maximum by at least 30 dBA. Furthermore, it was stated that the discomfort threshold was about 50 dBA, at which teachers had to make a special effort to speak. As a DND document stated, a maximum noise level (L_{max}) of 81 dBA was measured inside a classroom of Robert Leckie Intermediate School while an aircraft departed from runway 26, and a maximum noise level (L_{max}) of 79.5 dBA was measured inside a Spruce Park residence while an aircraft departed on runway 08. These noise levels would make it necessary to use a raised voice to communicate over distances of 1-2 m.

DND suggested that the noise berm provides some noise attenuation for the schools within Spruce Park. Although DND noted that the schools were within incompatible NEF contours, it suggested that the effects within Spruce Park could conceivably be modified by the fact that most of the potentially disruptive noise events are not distributed evenly throughout the day but are concentrated during takeoffs and landings. DND concluded that the significance of potential effects on child development and learning is moderate, with, once again, any adverse effects occurring primarily in Spruce Park.

Again, DND noted that the training jets do not fly during the winter months when school is active and that the schools are closed during training in July and August. The panel notes, nonetheless, that, with the extended flying season, there will be an additional impact on schools.

During the hearings, the panel did not hear any complaints from students or teachers regarding the noise. A teacher from a nearby high school on CFB Goose Bay who spoke at the hearings saw no harmful effects from the noise and noted that school drop-out rates have declined over the years.

In response to concerns raised during the public hearings and DND's own conclusions about the impact of noise on the learning and social development of children attending Robert Leckie Intermediate School and Spruce Park Elementary School, a more focussed approach to noise monitoring (EIS Monitoring Study 1) was put forward by DND.

The panel concludes that the effects of noise on learning and development are a cause for concern and require further monitoring, such as that proposed by DND. The panel recognizes that Spruce Park schools have been built close to the Goose Bay Airport, and, short of building a new school, there is little that may be done to alleviate the noise.

26. The panel recommends that DND investigate methods (e.g. runway usage, takeoff times) to mitigate Project-related noise that affects Spruce Park schools.

27. The panel recommends that a continuing program of monitoring and study be carried out to ensure that noise effects do not remain undiscovered and unmitigated. Particular attention should be paid to monitoring the impacts of noise on the school environment. The panel also recommends that the non-auditory impacts of noise, such as those on blood pressure, pregnancy and annoyance, be included in monitoring studies by the proposed Institute.

g) Impact of the Noise Berm

Discussion at the hearings on the impact of the berm was inconclusive. As one expert noted, the berm causes amplification of about 2 dBA at certain locations south of it, whereas it reduces noise levels by 6-l 1 dBA at another location. He also noted that any study of the impact is significantly affected by weather conditions, including temperature, relative humidity and wind speed and direction. He did not think that there was significant consideration of these variables in DND's assessment of the berm. Residents of the area generally supported the berm, although some thought it had little impact and only obstructed their view of the airfield.

DND feels that the berm will help reduce much of the noise exposure increase expected under the increased flying program for at least the central portion of Spruce Park. In the absence of westerly winds, the berm is expected to provide greater attenuation than was assumed for the purpose of generating NEF contours.

The intended purpose of the berm was to reduce noise in Spruce Park that was generated by a specific aircraft operation: the engine run-up at start of roll for takeoffs on runways 26 and 34. It was recognized that a berm would have a diminishing effect on noise level as the aircraft moved down the runway during takeoff and would have no effect on noise once the aircraft was airborne. The DND study showed that the berm was effective for the central and eastern areas of Spruce Park, was less effective on the western edge and actually caused a slight noise increase in the vicinity of the southern end of the berm.

The panel concludes that the berm has only partially met its objectives. The panel did not hear any reasons why the berm should be extended for further noise reduction.

28. The panel recommends that DND explore other methods of noise reduction for Spruce Park before considering any extensions of the berm.

6.4.3.2 Impacts of Noise on the Land

The discussion of impacts of noise on the land focussed on the startle effect of low-level flights. As one resident of nearby Mud Lake noted, low-level flights can be intrusive and irritating in a rural setting. In a written submission received by the panel, it was explained that "the noise is indescribably awful and the planes come and go at such speed and so close to the ground that one can never see them to prepare oneself and block one's ears before they have come and gone miles past."

While an expert from Health Canada stated that the data from studies in the vicinities of large urban airports do not provide convincing evidence of an increased risk of cardiovascular disease due to exposure to environmental aircraft noise, there could be a significant startle effect from an overflight where the noise exposure in the low-level training area can reach a

high peak (L_{max}, 115-I 25 dBA) with a rapid onset rate (greater than 60 dBA/second). However, the current literature does not fully support the hypothesis that long-term exposure to low-level military flight noise similar to that in the low-level training area would lead to increased risks of cardiovascular disease.

The experts who appeared before the panel felt that the significance of many of the non-auditory impacts of noise could be debated (e.g. impact on blood pressure, impact on pregnancy), but they all agreed that the impact of the startle effect is significant.

Although some groups that are often out on the land, such as the Innu, did not participate in the hearings, their written submissions indicated that they were impacted significantly by overflights and the resultant startle effect. Their written testimony indicated that the overflights were particularly frightening for children and elders within their community when out on the land.

The point that some Innu may be so afraid of the noise that they do not want to go out on the land has significant implications beyond health effects. A reluctance to go out on the land could significantly affect the social and cultural well-being of the Innu. This issue was considered in more detail in Chapter 5.

One intervenor presented the results of a study on the impacts of low-level flying on the Innu (1987-1988). He found that a significant percentage (34%) of those responding to the survey were afraid after being overflown, whereas others felt that they had suffered partial hearing loss, headaches and temporary deafness as the result of jet overflights. In terms of annoyance, Innu respondents felt that the jets were the most unwanted noise in the country.

One expert at the hearings indicated that, although there have been reports that chronic ear disease and auditory deficiencies are quite prevalent in the Innu and that the Innu may be more vulnerable to intense noise, the actual prevalence of chronic otitis media and hearing loss among this group is not known. Despite claims of hearing loss, the Innu have not agreed to have their hearing tested, and accordingly there is not a single documented case of ear disease and/or hearing loss due to noise from low-flying jet aircraft. Regardless, the expert noted, the potential for hearing loss cannot be denied in a susceptible individual.

Another expert recommended that a study be done to determine the various symptoms and consequences of exposure to very low level flights. Such a study could then lead to research for the purpose of quantitatively defining the conditions that would prevent the undesirable consequences of this type of exposure. Steps should be taken to prevent impacts on and help maintain the physical and psychological health and fitness of the communities exposed.

DND stressed that the maximum noise levels occur only during direct overflights, which are rare. Furthermore, for every doubling of distance between a noise source and receiver, the sound level drops by 6 dBA. Therefore, it does not take a very great increase in source-to-receiver distance to cause an appreciable drop in the sound level.

An expert from Health Canada found that existing laboratory and survey studies show that it is reasonable to expect that some relatively small but measurable temporary hearing loss would occur **as** a result of exposure to overflight noise. He felt that persons may get ringing in the ear for perhaps an hour afterwards or possibly an earache. However, he also indicated that it was very unlikely that any person in the low-level training area would suffer any permanent hearing loss.

A representative of the Regional Health and Social Services Board on the Quebec Lower North Shore felt that the reduced access to resources and the resulting reduction in the quality of food supplies as well as the impact on air quality and the environment may be just as serious as the direct health impacts of low-level flights.

In terms of health impacts, DND concluded that the risks from direct overflights are very low and that the risk of permanent hearing damage will be negligible. For the vast majority of overflights and individuals affected, there is no significant risk of acute cardiovascular effects attributable to low-level flying.

In researching the startle effect, DND found that the effect from low-level flying is very limited. DND noted that, although extremely loud and sudden overflights are very unpleasant and often frightening — particularly to infants, young children and the elderly — there should be no significant health risk resulting from the startle effect. As stated earlier, any individual is likely to be startled by low-level overflights with onset rates greater than 15 dBA/second. According to DND, German researchers have found that onset rates greater than 60 dBA/second may impair health. DND has stated that almost all overflights within the training area will have onset rates below 60 dBA/second.

As late-night sorties will be rare, DND has concluded that sleep disturbances are not expected to be a problem in the low-level training areas. The significance of other potential effects such as speech interference is also considered to be low.

DND has mounted some noise research models based on the need for information about the impact of noise in the low-level training areas. As a significant amount of flying will occur in river valleys, it is proposed that noise measurements be carried out in selected river valleys (EIS Monitoring Study 19) in conjunction with river valley ecosystem studies (EIS Monitoring Study 18). These studies would provide a greater level of confidence in noise prediction methodology while at the same time providing some of the information necessary to assess these highly used and potentially sensitive areas in greater detail.

The panel concludes that there appears to be no significant direct health impacts of low-level flying on people on the land. Indications are that more people are going out on the land. New roads, snowmobiles, planes and helicopters have permitted more access to the land. The panel was struck by the difference between the evidence from those who benefit from the Project and harvest from the land and who said that the Project had little effect on their land use, and the evidence from those who do not

benefit from the Project and who claim that it may have significant impacts on their land use.

The panel also **recognizes** that this apparent contradiction stems from a difference in perception towards the Project, a theme mentioned by several noise experts during the hearings. It is the panel's belief that the active participation of the Innu in the proposed Institute and the settlement of their land claims could provide the basis for ensuring a better incorporation of Innu concerns and perceptions into the management of the Project. This, in turn, would lead to a reduction in the adverse health impacts they feel when out on the land.

7.0 NATURAL ENVIRONMENT ISSUES

It became clear to the panel during the course of this review that the principal environmental issue associated with the Project was aircraft noise. Concern related not only to the effects of noise on human health, as discussed in Chapter 6, but also to the potential effects of noise on wildlife populations in general and caribou in particular, with some participants raising the special cases of night flying and river valleys.

Other major concerns brought to the attention of the panel included the lack of a good biological information base for the new areas that make up Option "B" and the potential for pollution from aircraft exhaust emissions and contaminant releases.

7.1 Effects of Noise on Wildlife

The effects of noise disturbance on animals are largely unknown, and there have been few studies. Although there are virtually no data on the effects of low-level flying on wildlife and the environment, the LIA cautioned that the absence of evidence is not evidence of absence. We may never determine cause and effect, but low-level flying must be considered one stress among many facing wildlife species.

Throughout this review, there was considerable focus on the possibility that wildlife exposed to low-level overflights could be adversely affected because of the "startle effect." Startle can increase stress levels by affecting an animal's physiological condition, including reproductive performance and patterns of habitat use. In reality, not much is known about the effects, particularly the long-term effects, of startle on wild animals.

It has been observed that the immediate and short-term reactions to startle usually include a tensing of muscles, which may be accompanied by head turning, and possibly the initiation of escape behaviour (running, flying). There may also be a physiological response (e.g. elevated heart rate), even in the absence of any detectable change in behaviour. However, the implications of long-term exposure to startle are virtually unknown.

Several presenters, including a trapper whose trapping area encompassed part of the present training corridor, stated that they have seen no adverse effects of the Project on wildlife and that wildlife populations fluctuate in response to food supply, harvest pressures and natural cycles rather than as a result of low-flying aircraft. Concern was expressed that the Trans Labrador highway has caused more disruption and a greater decline in wildlife than has low-level flying.

The panel learned that there is a widespread belief among the Innu of Utshimassit and Sheshatshit that low-level flying may be having a negative impact on the wildlife in their hunting territory. Much of the anxiety that Innu feel about the future of their land and culture is expressed as fear about the impact of future military flight expansion on wildlife, in particular the effects of jet noise and chemicals in jet exhaust. Innu and Montagnais hunters report that duck and goose eggs have been found cracked and abandoned; that nesting, hatching, growth and development of waterfowl are impaired; that abnormal numbers of dead fish have been found on lake shores and surfaces; and that dead partridge have been found in the immediate vicinity of a camera target site at Hope Lake — and they believe that military jets may be responsible for these developments.

In presentations to the panel, participants cited caribou, furbearers, migratory waterfowl and raptors as being most vulnerable when considering possible impacts from the startle effect. The impacts of noise on caribou are discussed in Chapter 8.

7.1 .1 Furbearers

Furbearers play an important role in the subsistence economy of Labrador. Twelve species are commonly trapped in the study area.

Some participants requested that the jets avoid furbearers when the animals are whelping. In the past, the Lake Melville Trappers Association raised concerns about flying over furbearing wildlife during the whelping period in major trapping areas surrounding Goose Bay. DND and the trappers agreed on a compromise to restrict low-level flying below 500 feet AGL over these areas from March 1 to May 31 during 1991 and 1992. It is unclear to the panel why this restriction was discontinued in subsequent years.

7.1.2 Waterfowl

The panel learned that the region provides habitat for approximately 29 species of waterfowl and contributes significantly to the Atlantic Flyway waterfowl stocks. Labrador's breeding populations of American Black Ducks and Canada Geese are significant when considered on a continental scale. Labrador accounts for 40% of the American Black Ducks and 80% of the Canada Geese produced annually in Atlantic Canada.

Breeding waterfowl are widely dispersed within wetland habitats throughout the Project area, particularly the northern training area of the current configuration. Exposure to overflights is therefore variable; if high-quality breeding habitat is overflown, larger numbers of waterfowl will be exposed to aircraft noise.

Information provided to the panel indicates that moulting American Black Ducks may be adversely affected by overflights, but little other information is available with which to judge the potential impact of aircraft noise on breeding, moulting and staging waterfowl. It is known that flushing and other avoidance behaviour will occur if waterfowl are overflown frequently and that staging and migrating ducks may avoid such areas.

Innu people who occupied the Minipi Lake bombing range in 1987 and 1988 said that there were no waterfowl to be seen anywhere in the vicinity of the range when they first arrived. It was only several days after the bombing and low-level flights

had stopped that ducks and geese started to return to the area.

Although there are no hard scientific data demonstrating that the waterfowl populations of Labrador have been adversely affected by low-level flying, there have been no long-term monitoring studies. It follows, therefore, that further studies must be undertaken to determine the impact of the Project on waterfowl.

Among the waterfowl in the Project area, the Harlequin Duck occupies a special position. The eastern population of this species is endangered, and Labrador is thought to support the largest number of breeding birds from this population. Because it has specialized nesting requirements (white water, fast-flowing rivers) and because river valleys are subject to higher exposure to overflights, the Harlequin Duck is particularly vulnerable to disturbance. There are almost no data to provide insight into the effects of noise on this species.

Under Option "A," DND has committed not to overfly areas that support populations of Harlequin Ducks during breeding, but other important waterfowl species (e.g. American Black Duck) could still be affected. Until it is demonstrated that low-flying aircraft have no effect on other waterfowl, Environment Canada does not support Option "A."

Under Option "B," DND has stated that it will not fly over areas that support important waterfowl populations during breeding, staging and moulting. However, such concentrations cannot be adequately avoided at present, because the locations are not known.

7.1.3 Raptorial Birds

Seventeen species of raptorial birds are known to occur in the Project area. Three of them (the Peregrine Falcon, the Gyrfalcon and the Golden Eagle) have particular importance because of scarcity or sensitivity. Labrador would appear to be the only area left in eastern North America where the Peregrine Falcon, an endangered species, and the Golden Eagle still breed in significant concentrations. Most (70–80%) of the falcon territories located in Labrador to date are on the coast and thus outside the Project area. However, information presented to the panel indicates that at least one Peregrine Falcon nest was located in the northern training area in 1993. This nest, which was first located in 1991, successfully produced three young birds in 1993.

Studies done elsewhere indicate some behavioural reaction by raptors to aircraft activity, especially helicopters. The impacts resulting from low-flying jet aircraft are virtually unknown. Concerns about potential impacts include changes in habitat use patterns, decline of reproductive success, displacement and mortality of eggs or young from nests and energetic stress. The panel also learned that three camera target areas are located in high-quality habitat for cliff-nesting raptors and that the tactical support routes traverse areas designated as important for raptors.

Monitoring studies carried out by DND indicate that, to date, there appears to be very little difference in raptor nesting activity between experimental (overflown) and control (not overflown) areas. If Option "B" is adopted, most of the habitat for cliff-nesting raptors would be eliminated from the flying area. The potential high-quality breeding habitat for Bald Eagles and Ospreys, however, would be increased. DND is committed to protecting identified nest sites but recognizes that this is unlikely to be 100% effective. Several participants indicated that they felt it would be more effective and practical to avoid important breeding habitat rather than known active nests, as this would ensure that most nests are undisturbed and that adequate areas are available for new nest sites, recruitment, re-establishment and migration.

The panel learned that critical habitats for the rare and endangered cliff-nesting raptors would not be avoided under Option "A" even though a direct, long-term impact from military activity was predicted. The degree of avoidance practised under Option "A" also depends on the extent of airspace closed to protect wildlife within the training areas. Once an area in excess of 10 000 km^2 is closed, the protection of species such as Gyrfalcon and Golden Eagle may be lifted entirely. Concern was expressed that areas preferred for flight training, such as the river valleys containing important raptor habitat, will be the first areas opened to overflights.

Recommendation 42, presented in Chapter 9, that current avoidance criteria not be reduced in Option "A" while the transition to Option "B" is being implemented is of critical importance for raptors.

7.1.4 Fish

Concern was raised about the effects of underwater noise created by low-level flying on fish populations, particularly in river valleys and PTAs where overflights are concentrated. One participant stated that, with diminishing ocean fish stocks, it is critical to be able to rely on inland resources for harvesting or tourism. Environment Canada and the Department of Fisheries and Oceans felt that the proposed study on behavioural responses of Atlantic salmon will address the concern about underwater noise, but that this study should be given a higher priority than that indicated by DND in the EIS. **The panel leaves a decision on this issue to the Institute.**

7.2 Information Gaps in Option "B"

Several participants criticized Option "B" as likely to have the same potential operational problems that affect current training. They feel that operational problems arising from the closures are likely to recur under Option "B" when more knowledge is accumulated. DND argued that as the area under Option "B" is larger and as Option "B" permanently deletes key habitats of the George River herd, it expects a significant reduction in the total area of closures, thus making the option viable.

Approximately 50% of the Option "B" configuration is new territory: it is not part of the current training area and, therefore, with few exceptions, has not been studied or monitored to any great extent. During the course of the review, the panel asked a number of questions about wildlife numbers and distribution in Option "B." Data gaps exist in the new parts of

Option “B,” and the proposed avoidance program has little meaning while these gaps exist.

The panel concludes that the data base for raptors, while not extensive, is reasonable. Four of the survey blocks that form part of the existing monitoring program for raptors in and adjacent to the current flying areas lie within the new portion of configuration "B." This leaves less than a third of the new area without information on raptors. It may be noted that, although there appears to be little preferred nesting habitat for the Peregrine Falcon in the new area, both Bald Eagles and Ospreys are present in greater numbers in Option "B" than in the current training area.

29. **The panel recommends that a survey be carried out to locate Osprey and Bald Eagle nest sites in the area covered by Option "B."**

The panel also believes that studies to monitor the effects of low-level flying on particular raptor species should begin immediately.

30. **The panel recommends that a study to determine the behavioural and population responses of Ospreys and Bald Eagles to overflights be an effects monitoring priority.**

Several review participants were critical of the manner in which DND surveyed for the avoidance of waterfowl habitat. They stated that survey coverage rather than the real distribution of habitat and waterfowl appears to be the factor constraining the extent of aerial closure. Only surveyed areas are integrated into the avoidance program, and these represent about 5% of the flight training areas. The review participants were concerned that avoidance of waterfowl habitat is based on one-time surveys and that the survey plot method was confined to areas DND considered to be prime habitat. They were also concerned that there may be considerable cumulative impacts on waterfowl populations. Mitigative measures are proposed only for above-average densities of waterfowl. The overall study area supports relatively low densities of breeding waterfowl, but the vastness of the areas results in a very significant contribution to the waterfowl stocks of the Atlantic Flyway. Waterfowl in these vast areas would not be protected from overflights.

Information on the numbers and distribution of waterfowl in configuration "B" is particularly inadequate. Although DND has prepared initial habitat capability maps for waterfowl in Option "B," this information is of limited value and must be updated with field studies. Incidental observations of waterfowl made during the raptor monitoring surveys indicate that both the numbers and variety of waterfowl present in the new area are impressive.

31. **The panel recommends that the important breeding, moulting and staging concentrations of waterfowl in the unsurveyed areas covered by Option "B" be given priority.**

Although some information presented to the panel indicates that the white-water nesting habitat required by Harlequin Ducks is in limited supply in Option “B,” the Churchill River watershed and adjacent watersheds leading into Lake Melville support significant breeding and migration stocks of this species, according to a critique on the EIS. In addition, the document indicated that there have been a number of sightings of Harlequin Ducks by residents in the Lower North Shore area of Quebec within the last 10 years in the non-inventoried sections of the study area.

When DND inventoried the south part of the study area in July 1992, no Harlequin Ducks were sighted. At that time of year, the females may be nesting and the males may already be gone from the breeding sites. The probability of sighting Harlequin Ducks in July is, thus, very low. It is possible that the quantities of breeding habitats were underestimated, particularly in the southern part of the study area.

32. **The panel recommends that the Institute consider whether or not the identification of potential nesting habitat for Harlequin Ducks needs to be undertaken and if it can be accomplished as an add-on to other field studies (e.g. river valley study).**

7.3 Impacts of Night Flying on Wildlife

The proposed increase in the number of low-level sorties at night caused a number of participants to question what their impact might be on wildlife populations. Most small mammals and the predators that feed on them are mainly or partly nocturnal. Owls, for example, are primarily nocturnal. In addition, owls have very sensitive hearing, which they rely on when hunting. Many ducks and geese and most other birds display some level of activity at night as well as during the day. In reality, most of these groups may be more correctly referred to as crepuscular, which means that they are most active at dawn and at dusk, rather than nocturnal.

Very little is known about the reaction of these animals to overflights at night. There will, of course, be a greater overlap between their activity periods and overflights because of the increased number of night sorties.

Caribou and moose will also likely be overflown at night. As with the other animals, the reactions of caribou and moose to night flights have not been studied. The panel has no information with which to judge the impact of night flights on wildlife. There may be an effect, but, without properly structured studies, the impact of night flights cannot be distinguished from the overall impact of overflights.

33. **The panel recommends that, depending on the information generated by baseline studies in the new flight training configuration and armed with knowledge of how many of the 1400 proposed night sorties are low level, the Institute determine if the impact of night sorties needs to be monitored.**

7.4 River Valleys

River valleys are oases — special places for wildlife (and for people). The panel was reminded of this by many presenters

during the review. As is the case everywhere, river valleys in the Project area generally support more diverse and productive vegetation than do the surrounding uplands. This, in turn, provides a variety of habitats for wildlife. Most wildlife species in the area make use of river valleys; overwintering locations for moose are a well-known example. As was pointed out by many participants, including a biologist, wildlife populations in and adjacent to river valleys may be most at risk from the Project, because river valleys are also preferred locations for low-level flight training.

Of particular concern to the panel is the limited attention paid to river valleys to date and the general lack of information on them in the new area of configuration "B." **The panel believes that river valleys require much more attention.**

34. **The panel recommends that priority be given to studies aimed at describing river valley resources and monitoring programs to evaluate impacts of the Project on wildlife resources in them.**

DND made the commitment not to fly along, but rather to fly only across the Churchill River valley and the Trans Labrador highway at a minimum altitude of 250 feet, if Option "B" is adopted.

35. **The panel recommends that DND adopt the commitment to fly only across the Churchill River valley and the Trans Labrador highway. If operationally viable, this avoidance measure should be considered for other high-use valleys.**

In its preliminary mapping of river valley resources, DND identified extensive areas of high-quality overwintering habitat for moose in the southern part of the reconfigured training area. **With the proposed extended flying season, overwintering moose could well be exposed to low-level sorties at a critical time of the year. It is important that winter locations of moose be identified.**

36. The panel recommends that a study be undertaken to determine the locations of winter concentrations of moose in the Option "B" configuration before releasing it for flight training.

7.5 Pollution

A number of participants, particularly representatives of aboriginal groups, were concerned that exhaust emissions and the occasional emergency release of such contaminates as jet fuel may result in pollution of the air, water and soils of the Project area.

Although there appear to be some localized air quality problems with regard to increased nitrogen oxides and carbon monoxide levels in the vicinity of the airport from time to time, this is consistent with the situation around most major airports. Nevertheless, the panel feels that levels of these materials should continue to be monitored, as discussed in Chapter **6.** In general, however, the air in the Project area has been shown to be of very high quality.

Of greater concern to aboriginal and other groups that depend heavily on harvesting is the possibility that pollutants may enter the soils and water bodies and contaminate fish, vegetation and wildlife (i.e. food chain contamination). People worried as well about changes in the number, distribution and migration of wildlife as a result of contamination. These possibilities have been given little attention by DND or the regulatory agencies to date. **The panel did not receive evidence that a problem exists. However,**

37. The panel recommends that, in view of the increased number of sorties, food chain monitoring studies be carried out.

In the written submissions and during the hearings, the use of “chaff” was raised as an issue. The release of chaff (fine strips of aluminum) from aircraft is a World War II technique used to confuse enemy radar. It has been used in Labrador by NORAD forces in training scenarios, but DND confirms that it is not used by Allied Forces and that there are no plans to introduce it.

7.6 General Conclusions

In summary, the panel believes that, at present, there is little evidence to suggest that wildlife populations or the natural environment will be harmed in any significant way by the proposed increase in low-level flights. It appears at this time that any additional stress placed on animals exposed to low-level flying activity does not add significantly to the stress levels that are a normal and integral function of wildlife interactions. That is not to say that there are, in fact, no minor environmental effects now or that more serious ones will not become apparent in future. It is clear that monitoring and other studies must be carried out to ensure, as much as possible, that any adverse impacts will be noted early and mitigated.

8.0 CARIBOU

It is almost impossible to exaggerate the importance of caribou to residents, particularly aboriginal residents, of the Quebec-Labrador peninsula. Caribou are at the base of many cultural activities of the region and are an important base of the economy. Thirty years ago, a Canadian Wildlife Service publication noted that caribou were as important to an aboriginal person living in the North as a job was to a citizen of southern Canada. The panel has learned that this is, in many respects, still true today. For many presenters, the caribou (especially the George River herd) was the chief source of their anxiety about the Project. They wondered what the effect of the Project might be on the caribou's environment, on the number of animals in the herd and, by extension, on the economics and cultural relationship they have with the caribou.

Although George River caribou are the principal concern, the Project area also overlaps with the ranges of the much smaller Red Wine and Lac Joseph caribou herds (Figure 5). During the course of this review, much information was presented to the panel on caribou in the Project area. This information falls into four categories: social/cultural, economic, environmental and management considerations.

8.1 Social/Cultural Considerations

For northern residents, particularly those of aboriginal descent, caribou are, even today, an integral part of social structure and culture. The panel was told that hunting is an essential component of the social life of most small communities. Although imported foods are used in most northern households today, caribou and other country foods form the major part of the diet, particularly in aboriginal households, However, hunting is more than just a food-gathering activity. Hunting provides identity, self-worth and a certain measure of security. For aboriginals, hunting is seen neither as a specialized occupation nor as an avocation for the privileged, but as the birthright and heritage of every man and woman.

8.2 Economic Considerations

The panel was told that an estimated 38 000 caribou from the George River herd are harvested annually. This is a highly significant contribution to the economy from the subsistence (nutritional), outfitting and commercial perspectives. A representative of Makivik Corporation pointed out that the caribou harvested by the Inuit of Nunavik in 1993 provided approximately 800 000 kg of fresh meat to the local communities. Although no precise information is available for the amount of caribou meat consumed by residents of Labrador, it is known that 10 000-15 000 George River herd caribou are harvested there each year.

George River caribou are the primary resource supporting the important sport hunting industry in Quebec and Labrador. The George River herd has also supported a commercial harvest. The Labrador Inuit Development Corporation was engaged in a commercial harvest of caribou for a number of years until recently, when the processing plant in Nain developed structural problems. The meat was sold in the Far East, Europe, the United States and central Canada. Approximately 60 direct jobs (and more spinoff employment) were created by this commercial harvest. The harvest was carried out in the spring and generated income at a slow time of the year.

Quebec had not permitted a commercial caribou harvest until recently, when the Crees, the Naskapi, the Inuit and the Government of Quebec reached an agreement on the establishment of such a harvest in that province. Four processing plants have already been built in four Inuit communities as part of a program to harvest and market caribou meat.

Caribou is also a basic attraction for the adventure tourism industry in the North. Although other attributes are included in the package, tour operators often rely on the caribou as the key market attraction. Presenters in Happy Valley-Goose Bay offered mixed views on the future of this industry in Labrador, the most common view being that growth would probably be limited in the project area.

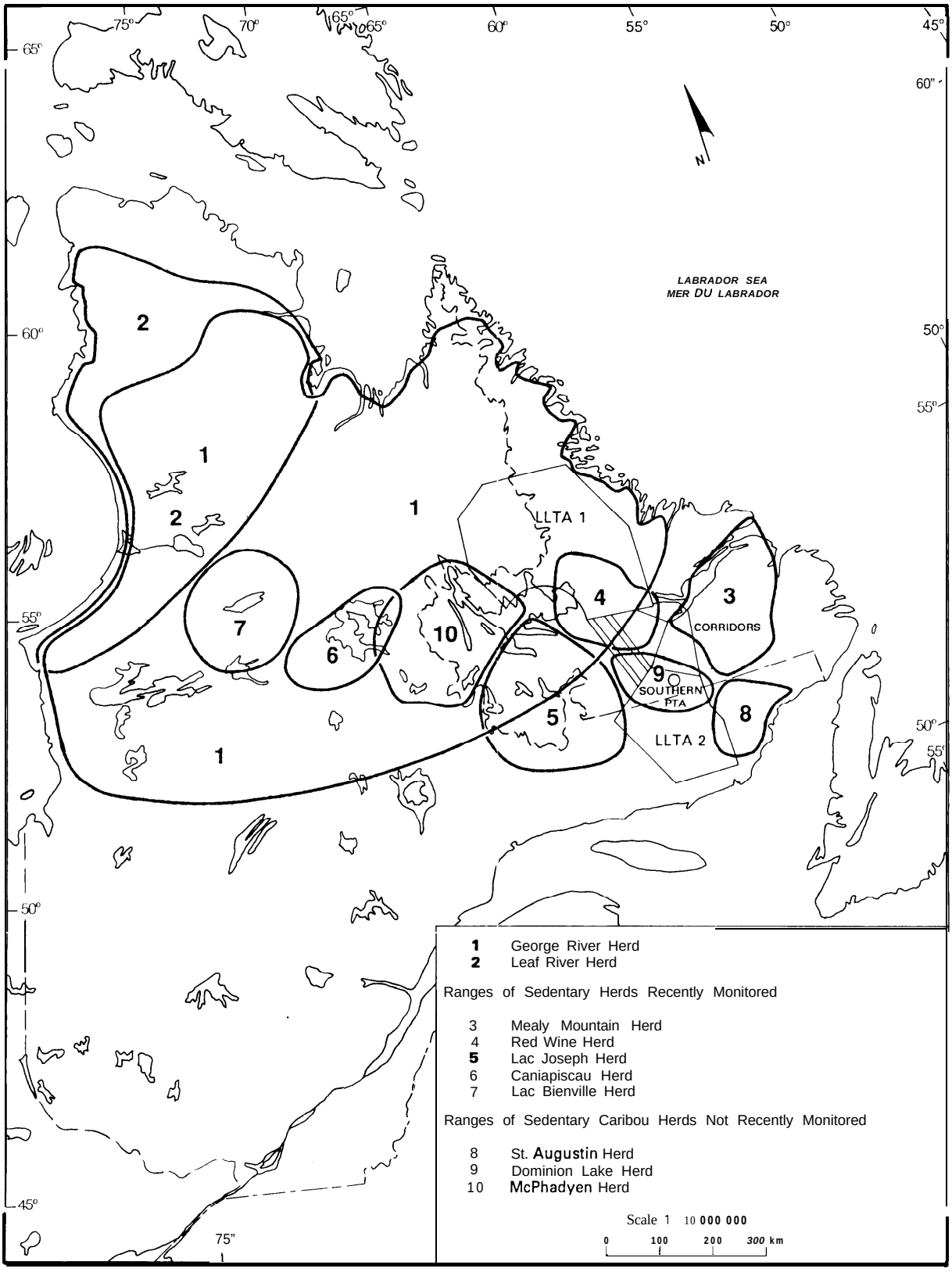
The George River herd, therefore, is a key to the continuing economic well-being of a number of northern Quebec and Labrador industries and the social well-being of northern residents. If the herd is now in decline, as most biologists believe, how will this affect the communities and the commercial enterprises in Labrador and Quebec that depend on it?

Recently, as the caribou population increased dramatically, the range of the herd expanded, bringing it closer to more communities in Quebec and Labrador. A higher level of harvesting resulted from easier access to a larger number of animals. The larger herd size also triggered the proliferation of outfitting camps, primarily in Quebec. It was pointed out to the panel that, as the herd declines in numbers, the range will contract, with the centre of distribution shifting eastward to the vicinity of the Quebec-Labrador border. If the herd declines to very low levels, the largest numbers of caribou may be centred in northern and western Labrador. In any event, the decline may continue until some population level is reached at which food resources are in balance with caribou numbers and predation.

The history of fluctuations of the George River herd supports this view. The cyclic population trends of the herd occur quite independently of military overflights, with population lows (and highs) occurring approximately 100 years apart. Information presented to the panel by the Government of Newfoundland and Labrador suggests that the next "low" will likely occur sometime in the next 25-35 years.

The declining numbers of George River caribou and the economic and social consequences demand attention.

Figure 5 - Distribution of Caribou Herds in Relation to the Study Area and the Low-Level Training Areas



8.3 Environmental Considerations

8.3.1 Potential Effects of Low-Level Flying

Concerns raised about the potential impacts of low-level flying on caribou centred around the potential for noise and the sight of the jets to displace caribou from important habitats, change their migratory patterns, increase stress levels or cause injuries owing to startle and decrease reproductive success. Concern was also expressed that exhaust may pollute plants, leading to a reduction in the quality or quantity of caribou food resources and contamination of caribou tissues. A potential increase in hunting and poaching as a result of an influx of recreational hunters was also mentioned.

Some review participants argued that the birth rates, calf survival and adult survival of the George River and Red Wine caribou herds are normal and are not influenced by military flying. They said that there is no evidence that Project-related disturbance or habitat alterations affect productivity. Many participants, both native and non-native, said that they regularly go out on the land and have not noticed any negative effects on the wildlife populations, including the caribou. One biologist stated that the disturbance that has the most serious impact on the caribou energy budget is harassment by insects and that the second most serious disturbance is hunting, especially from snowmobiles.

Other participants stated that they believe that the caribou are in trouble. The caribou are behaving differently and seem to be sickly. Their livers are full of lumps and are sometimes stuck to their ribs or back bones. Their bone marrow is changing. Weights of fetuses are decreasing, and fewer females become pregnant. Migratory routes have changed, fewer caribou are seen in open marshes and the caribou no longer calve in certain areas. Some hunters believe that George River caribou are trying to come back into the Harp Lake area, which was used as a calving area in the early 1960s. They believe that low-level flying may prevent the caribou from calving there. DND suggests that the decreased use of Harp Lake as a calving area may be a natural shift or a result of intense hunting in the area.

One biologist stated that caribou appear to have a high degree of resilience to human disturbance and that seasonal movement patterns and distribution appear to be a function of population size rather than of disturbance. He, along with other biologists, noted recent improvements in the health of the caribou herd. His study of caribou physical condition, forage and movement show that the caribou are travelling more slowly and going less far and that their marrow and back fat reserves have improved.

Several participants indicated that low-level flying cannot be isolated as the only problem, but it may be contributing to the problems affecting caribou. For example, in the insect harassment period, even moderate disturbance from low-level flying may be sufficient to push the animals below a minimum energy budget threshold. Concern was expressed that natural predation and disturbance from military flying may be preventing the recovery of the Red Wine caribou herd, despite over 15 years of protection from human hunting. Participants cautioned that insufficient information exists at present to allow for a sound evaluation of long-term effects on caribou herds as a whole.

Most evidence, including video evidence, presented to the panel indicates that startle may cause some brief running movement (5-10 m) in caribou, but that there are no other behavioural signs of stress. Although some participants believed that the health, numbers and distribution of George River caribou could be adversely affected by the Project, most participants who reported their experience on the land indicated that they see no adverse effects — that caribou and other wildlife are as numerous and as healthy as ever. The majority of wildlife experts who made presentations to the panel stated that, notwithstanding the possible relationship between overflights and calf survival in the Red Wine herd, low-level flying has not had significant negative effects on either the George River or Red Wine caribou herd. This is consistent with the findings from a number of other jurisdictions, particularly Alaska, that decades of overflights have not adversely affected caribou.

8.3.2 The George River Herd

The George River herd of migratory caribou (barren-ground caribou) is the largest herd in the Project area. At an estimated 600 000 animals, it is also considered to be the largest herd in the world. This herd ranges over much of northern Quebec and Labrador between Hudson Bay and the Labrador Sea and south to the 52nd parallel (to southern James Bay, see Figure 5). The George River herd has increased its use of LLTA-1 in the current training area (Option “A”) in recent years and now makes extensive use of LLTA-1 during all periods of its annual cycle. It overlaps the northern and northwestern part of LLTA-1 during spring migration, calving, summer and the rut periods. In winter and early spring, all of LLTA-1 may be occupied by George River caribou. However, the overlap during calving, when the animals aggregate in a restricted area, is considered to be most critical and is the basis for the major avoidance of caribou during flight training.

The recommendation by DND that the flight training area be reconfigured in the future (Option "B") to delete permanently the sensitive portions of LLTA-1 has, the panel believes, considerable merit. Although the panel found no convincing evidence that the Project will adversely affect the George River herd (the present decline in numbers is attributed to overgrazing of range), deleting the locations for calving and other sensitive life cycle activities from the training area is a decision that can have only positive consequences for this herd.

The panel concludes that the environmental requirements of the vital George River herd are not likely to be greatly infringed by the Option "B" configuration. No future changes in numbers or distribution of this herd would likely be attributable to the Project.

8.3.3 The Red Wine Herd

The Red Wine herd, currently estimated at 700-800 animals, occupies a range of approximately 26 000 km^2 centred on the Red Wine Mountains. About two-thirds of the herd's range lies within the current training area. All of this herd's range is within the boundaries of the proposed (reconfigured) training area. The Red Wine herd displays characteristics of woodland caribou, including short migrations and local, dispersed calving. A number of presenters pointed out that the small size of this herd and its wide dispersal (particularly during calving) to avoid predators make it vulnerable. The wide dispersion/lack of aggregation creates difficulties for the avoidance program; thus, the overall exposure of the Red Wine caribou herd to overflights is high.

The Red Wine herd was the subject of the only "cause-and-effect" study carried out during the Project assessment. This study suggests that exposure to many flights could affect calf survival. The authors of the study found a significant negative correlation between calf survival and the amount of exposure recorded for the female during the calving period, during the immediate post-calving period and during the period of insect harassment. Startle responses, seen as running or walking, were brief in duration and distance, and daily movements of the caribou were slightly greater. Owing to the reflex nature of the response, the authors felt that habituation to such stimuli is not likely. It was also observed that caribou responded significantly sooner and ran significantly longer and farther in response to helicopter approaches than in response to jet overflights.

Some participants criticized the study as "inconclusive" owing to the small sample size and the failure to include the influence of other factors. They stated that the energetic costs due to low-level flying disturbances are low, and there was no evidence of a significant threat to the caribou population of the Red Wine herd.

One of the authors of the cause-and-effect study asked whether low-level flying activity adversely affects caribou. The answer provided is that we do not yet know, but perhaps it does. Certainly, there appears to be agreement among the specialists who addressed the panel that the major factor limiting Red Wine herd numbers is predation by wolves (and possibly black bears) rather than low-level flying. **With the transfer to Option "B," this is now the only herd that will be substantially overflown by flight training activities, and encounters may be difficult to avoid. Therefore, the panel recommends that high priority be given to "effects" research on the Red Wine herd, as highlighted below.**

The panel concludes that the Red Wine herd is the herd potentially most at risk from future flight training activities and recommends that the bulk of the budget for studying Project-caribou interactions be reserved for this herd.

38. The panel recommends a continuation of the Red Wine caribou calf survival study.

The Institute may wish to include caribou heart rate telemetry studies to monitor and compare physiological reaction to overflights and to natural stress (e.g. predation) in its research and monitoring program.

8.3.4 The Lac Joseph Herd

The Lac Joseph herd is another small woodland herd of resident caribou, which, together with the Red Wine herd and three or four other adjacent herds in Labrador and Quebec, form a continuum (continuous band) of caribou across central Quebec and Labrador. As pointed out by a caribou biologist, these are not really herds at all: the herd designation is just a convenient label for management purposes. The eastern part of the Lac Joseph herd range, including a portion of its calving area, would be overflown in the proposed reconfigured training area. There is no overlap with the present flight training area. The Newfoundland and Labrador Wildlife Division, among others, has proposed that a wildlife reserve be created to protect this herd and has recommended that a buffer zone be established around the reserve to guard against overflights. DND does not plan to avoid overflying the Lac Joseph herd, as most of this herd's range is located to the west of the training area.

The panel concludes that the environmental requirements of the Lac Joseph herd may be somewhat infringed by the Option "B" configuration. A caribou biologist told the panel that this herd has excellent potential for growth and that its welfare should not be ignored.

39. **As a precautionary measure, the panel recommends that the seasonal distribution of the Lac Joseph herd be established prior to the commencement of flying in the reconfigured training area to determine if adjustments should be made to the training area's western boundary.**

Review participants presented the panel with many specific recommendations for mitigating the impact of the Project on caribou and for monitoring and research studies aimed at learning more about Project-caribou interactions. These suggestions have merit. Some of them relate to the George River herd, which will be largely excluded from the flying area under configuration "B." Other recommendations focussed on the Red Wine herd. **The panel believes that the emphasis in future caribou studies should be placed on the herds whose critical biological activities (e.g. calving, post-calving, etc.) take place within the reconfigured training area. These will be the Red Wine herd and possibly the Lac Joseph herd, whose range will be overlapped by the new training area.**

8.4 Interjurisdictional Considerations

In a presentation to the panel, a representative of the LIA made the obvious but important point that the range of the George River caribou herd does not correspond to political boundaries. It is a discrete herd, which occupies a discrete range. It is more than just a part-time Quebec herd and a part-time Labrador herd. Management of this herd is rightfully the

responsibility of the governments of Quebec and Newfoundland and Labrador as natural resource managers. However, anyone who is familiar with government organization will understand how difficult it is for these two governments (or any two governments) to establish a management plan and put it into effect. If the herd continues to decline in size and the centre of abundance shifts one way or the other, common management objectives, on which there is little or no agreement now, will be hopelessly out of reach.

The panel agrees with the statement of one of the technical experts who pointed out that DND has no mandate to manage wildlife, yet finds itself holding the responsibility for collecting data and designing avoidance programs. In recent years, and in the absence of an overall management plan, DND may have provided the closest thing to a management plan for the George River herd.

The question of the survival and well-being of this herd is not only a question of biology. It is a social question also. It is not enough that the management biologists are satisfied; it is important that the program be worthy of the confidence of the main users, particularly aboriginal people. **Users, particularly aboriginal users, do not always understand or trust the scientific approach to management. As well, scientists often question the value of local knowledge. However, the panel believes that traditional ecological knowledge, both aboriginal and non-aboriginal, can make a valuable contribution to management. Such knowledge would seem to be of particular worth considering the absence of reliable scientific data.**

To date, none of the pleas for joint management of the George River herd has filtered through to the governments that hold the responsibility. The panel believes that it is time that they did. How better to allow DND to assume its rightful role and to enable the managers and users to benefit from each other's strengths?

8.4.1 Caribou Management Board

Under the James Bay and Northern Quebec Agreement and the Northeastern Quebec Agreement, there is already a management regime in place and established legal rights. The rights of the Quebec Inuit, Cree and Naskapi to take caribou sufficient to meet their needs are guaranteed. These groups all traditionally hunted, and currently hunt, the George River caribou. A management body known as the Hunting, Fishing and Trapping Coordinating Committee (an advisory body with representatives from the three aboriginal parties and the Quebec and federal governments) has also been established.

Caribou user groups in Labrador are in a different situation. There is no formal priority allocation for aboriginal people in Labrador and no management arrangement that provides for co-operation with aboriginal users.

Presenters at the hearings invariably placed the George River caribou herd as the top natural resource in the Project area in terms of cultural, spiritual, nutritional and economic value. Many of the participants agreed on the need for a caribou management board for the George River herd. This herd is the only major migratory herd in Canada that is without such a management board, and several review participants felt that a joint Canada/Labrador/Quebec management board for the George River herd is critical for effective management. Given the herd's mobility, it was stressed that any plan developed must involve both provincial jurisdictions.

Currently, DND contributes to caribou research and monitoring. Participants felt that this should be done within the context of overall herd management, where DND is no longer being held financially responsible for doing work that is rightfully the responsibility of government departments with mandates for resource management.

Participants discussed those characteristics of a caribou management board that they would like to see in place in order to minimize some of the difficulties they envisage in developing a management plan for the George River herd.

The LIA stressed the need for responsible management, given the guaranteed harvest for the Inuit, Cree and Naskapi in Quebec; given the commercialization of caribou meat in that province; and given that the herd could decline in numbers. The LIA stressed that management is necessary to understand and get consensus on both sides of the border on the state of the herd, the stresses on it, how the total allowable kill should be established and how the harvests should be shared.

Inuit hunters and elders stressed the importance of factoring in their traditional ecological knowledge when making decisions about wildlife and wildlife management. They noted that their knowledge and experience have to be treated with respect and that they should be considered as experts. They expressed the hope that all parties would put their knowledge together and come up with the best solutions, as neither they nor the scientists had all the answers. Preserving the status quo because the herd is underharvested is unacceptable. Action should not be deferred until a crisis occurs.

The LIA's recommendation, which the panel supports, is the establishment of a joint management board for the George River caribou herd along the lines of that for the Beverley-Kamanuriak and Porcupine herds in northern Canada. The LIA categorized its proposal as the only responsible way to ensure the attainment of several interrelated objectives: conserving the George River caribou herd; protecting the rights and interests of aboriginal people, both defined and undefined; maintaining the honour of the Crown in the context of a massive ongoing development project in which the Crown has a significant vested interest; and ensuring that the Project and DND's responsibilities with respect to monitoring and mitigation of the impacts of the Project can be carried out and placed within the context of a comprehensive management scheme that accounts for environmental, conservation and human interests.

40. **The panel recommends that governments ensure the establishment, at the earliest possible date, of a joint Canada/Quebec/Labrador caribou management board for the George River caribou herd that would have underlying principles, objectives, responsibilities and membership as outlined in this report. Lessons learned in the**

management of the Beverley–Kamanuriak and Porcupine herds in northern Canada should be considered in the development and operation of the Board.

Given the failed attempts of the past to set up a joint management board involving both provinces, and given Canada's special responsibilities for native people and their aboriginal rights, the panel feels that the federal government should play a lead role in setting the process in motion. The panel acknowledges the defined rights of the Quebec Crees, Inuit and Naskapi but also firmly believes that the protection of the undefined rights of aboriginals of Labrador and Quebec can best be served through the setting up of a joint management board for the George River herd. Aboriginal peoples and other users must also be full and equal participants in the process. Panel suggestions on various aspects of the board follow.

8.4.1 .1 Underlying Principles

During discussions on caribou management at the hearings, the panel learned that there are several requirements for a successful management board. They include clearly defined roles, the ability to overcome jurisdictional barriers and the careful selection of representatives for board membership. Members appointed to boards should have the authority to make commitments, be flexible and imaginative, seek experience from outside sources, ensure political support and be patient.

The panel learned the importance of shared responsibility for management between users and government, the involvement of all affected interests, meaningful third-party involvement and direct community input. The panel was also told of the importance of mutual understanding of interests and of the consequences of decisions, trust among board members, comprehensive education and information systems, an accountable process and a committed staff with resources, knowledge and connections.

The panel believes that the above requirements must be factored into the development and operation of the caribou management board.

In addition to the above, the panel was told at the hearings of the "3 C's" **principles that should apply to a caribou management board. The panel believes that these principles, which are described below, must be applied to the joint caribou management board established for Labrador and Quebec.**

8.4.1.2 Composition

The panel heard of two models that were used for wildlife management boards: those composed entirely of non-government representatives, and those with a combination of government and non-government representatives. **The panel believes the better model is the latter.** The panel heard that the benefits of an organization composed of government and non-government representatives include the fact that participants become part of a team, thus removing the tendency of adversarial relationships. In addition, under this arrangement, government representatives are well placed to explain what they can and cannot do and to suggest viable approaches. Governments do not relinquish or transfer any legal authority; they merely share decision making with user groups and respond promptly and formally to recommendations. They can also provide access to information and administrative support. The panel was also told that, ideally, any government representatives should remain part of the organization for a number of years, so that they develop an understanding of community concerns. It was also told that community members should be provided with an honorarium for their time. The panel repeatedly heard that all interests have to participate in the process or it will not work.

8.4.1.3 **Communication**

Communication was singled out as one of the greatest challenges to a caribou management board. Public education and consideration of traditional ecological knowledge and cultural values were discussed as essential parts of communication.

The panel repeatedly heard that no one has all the answers. Knowledge and data have to be combined, and individuals and groups have to listen to each other to be able to ask the right questions and find the right answers. Aboriginal knowledge about animals and nature must be respected and treated as expert knowledge, not just as nice-to-hear stories. The LIA recommended that there be a systematic way of soliciting Labrador Inuit traditional ecological knowledge so that it can be appropriately tested where necessary and incorporated into the general data base. It further recommended that DND and government consider this Information in the development of all aspects of the avoidance, mitigation and monitoring programs. The LIA made it very clear that it would like to be directly involved in planning and implementing research it considers important.

8.4.1.4 **Consensus**

The panel heard that, if at all possible, decisions should be made by consensus. Ideally, this means consensus not only among members of the management board but also among the communities involved. It is a time-consuming process but one in which the recommendations generally have greater support, and community self-management can be initiated right away, reducing the need for formal regulations. Participants at the hearings also indicated that a consensus process is important in that it gives communities confidence that their concerns will be addressed by the management board.

Working in partnership on common objectives reduces the adversarial climate, and accommodation replaces confrontation. Trade-offs become possible, and the "we versus they" syndrome is eliminated. **The end result of the "3 C's" is a fourth C — credibility.**

8.4.1.5 **Objectives**

The panel believes that the management board should have the following objectives:

- **co-ordinate management of the herd in the interests of all users;**

- **establish a process of shared responsibility for the development of management programs;**
- **establish communication among users and governments in the interests of co-ordinated caribou conservation and caribou habitat protection; and**
- **discharge the collective responsibilities for the conservation and management of caribou and caribou habitat as per the spirit of the management agreement.**

8.4.1.6 **Responsibilities**

The board should have the following responsibilities:

- **make recommendations to governments and user groups for the conservation of the herd and its habitat in order to maintain a size and quality that will sustain the requirements of traditional users;**
- **monitor caribou habitat to promote better maintenance of a productive habitat;**
- **conduct an information program;**
- **acknowledge and protect the harvesting rights of the Labrador and Quebec aboriginal peoples as identified either in final land claims agreements or in Agreements-in-principle;**
- **acknowledge the rights of other users;**
- **assess and report on the operation of the herd management plan to governments and user groups; and**
- **liaise with and advise the proposed Labrador Institute for Environmental Monitoring and Research on project-related caribou issues.**

8.4.1.7 Membership

The joint caribou management board should have representation from at least the following groups: Inuit of Labrador and Quebec, Innu, Labrador Métis, Naskapi of Quebec, Montagnais of Quebec, Crees of Quebec, non-aboriginal users in both provinces, caribou outfitter associations and the governments of Canada, Quebec and Newfoundland and Labrador. c

9.0 MITIGATION AND AVOIDANCE

Mitigative measures are used to reduce negative impacts that result from projects. Through their successful incorporation into the design and implementation of a project, it may be possible to minimize the residual impacts that arise. DND has proposed a number of mitigative measures with respect to low-level flying activities in Quebec and Labrador. The main mitigative measure is avoidance. The panel heard a considerable amount of input from both DND and other groups on the avoidance program, as will be discussed later in this chapter.

Other mitigative measures have been proposed and implemented for the Project. Since 1989, DND has created several new positions on the Base — Base Environmental Officer, Community Liaison Officer, Native Liaison Officer and Social Worker — in an attempt to address certain issues that arose during the early stages of the environmental review process. These were the first measures used to mitigate the impacts of low-level flying activities.

In 1990, DND began a formal avoidance mitigation program along with other mitigative measures, including the Base Environmental Protection Plan. Both the avoidance program and the Base Environmental Protection Plan have grown over the years. The avoidance program has become more refined, and the criteria for avoidance have become more exact. The Environmental Protection Plan has now expanded into the Goose Bay Environmental Action Plan. The plan addresses such issues as waste management and disposal, noise abatement, hazardous materials and emergency response measures. In addition, the plan has set up procedures for dealing with specific environmental situations that may arise from the low-level flying activities. The Goose Bay Environmental Action Plan is currently overseen by the Base Environmental Officer.

In 1992, DND created two additional positions related to its mitigation program, those of Mitigation Co-ordination Officer and Biophysical Effects Co-ordination Officer. The Mitigation Co-ordination Officer's role is to supervise and co-ordinate the mitigation program activities at the Base level. The Biophysical Effects Co-ordination Officer is primarily Involved in the implementation of the wildlife avoidance monitoring program.

Recent attempts by DND to reduce impacts that the town may experience include the creation of problem-solving groups like the Happy Valley-Goose Bay Liaison Committee. Mitigation has also provided for noise abatement by a variety of measures (construction of a berm, use of specific runways, etc.). The success of these measures and others proposed in the EIS will have to be examined in the future, and the measures will need to be modified as required.

41. **The panel recommends that the Institute examine the success of the "in-town" mitigative measures proposed in the EIS and suggest modifications to these measures as required in the future.**

9.1 Development of the Avoidance Program

DND's major mitigative measure in the past few years and proposed in the future is avoidance — that is the closure of parts of the training area to low-level flying to protect wildlife and people from overflights and startle. Some of the most demanding questions with regard to the Project revolved around the issue of mitigation and avoidance. Many review participants saw the avoidance program as the key to the acceptability of the Project. To many of the public, the program seemed effective or promised to be effective. However, questions and problems have been growing.

DND's objectives are to develop a viable low-level flight training program, while at the same time providing environmental protection. The extent of the impact on natural systems, people and wildlife is generally unknown. An avoidance program seemed the simplest, most practical and most prudent approach — a preventative approach that eliminated the need to assess or quantify effects. The concept is based on separating low-flying jet aircraft from sensitive wildlife or their habitats and from areas of human activity. Aircraft flights are flexible in time and space. If aircraft can reach any area in the training areas, they should also be able to avoid any area.

The program, largely paid for by the Allied nations training out of CFB Goose Bay, developed and evolved rapidly. The criteria and methods changed often. In developing the avoidance criteria, DND had no precedent to follow, and there were few guidelines for refining the avoidance criteria. The panel was told that no one had tried to practise avoidance on this scale before.

Prior to 1990, resource users within the low-level training areas were avoided in response to requests and complaints received. Based on a commitment made in the 1989 EIS, DND implemented a formal avoidance program in 1990 and carried out baseline studies and monitoring surveys directed at ensuring that resource users and sensitive wildlife such as caribou at the calving grounds, nesting waterfowl, raptorial birds and Harlequin Ducks were avoided by low-level overflights. Systems to gather information on the location of camps, wildlife and wildlife habitats were put into place, and arrangements were made to ensure that pilots received the needed information on what and where to avoid. Avoidance criteria were developed, specifying the time, altitude and horizontal separation for certain environmental elements and for people.

9.2 Feasibility of the Avoidance Program

A series of reports, initiated by the Innu Nation and submitted to the panel in the fall of 1993, first brought the problems in the avoidance program to the attention of the panel. These reports concluded that the Project could not meet its stated twin objectives — viable flight training and environmental protection — by avoidance; that there are too many noise-sensitive areas to avoid; that avoidance measures are devised to maximize military flight training and minimize avoidances of people and sensitive wildlife areas; and that little protection is being given to sensitive wildlife and to Innu and non-Innu hunters and trappers.

Certain avoidance closures in the training areas and in transit corridors have created operational problems for Allied flying activity. DND is now having difficulty retaining operational viability of the flying program while ensuring that avoidance criteria are met. The number of restrictions is much larger than anticipated. Currently, avoidance frequently closes 1 0–20% of the training areas, and at times George River caribou herd closures may comprise up to 40% (40 000 km^2) of the areas. The Allies maintain that operational problems arise when 10% of the training area is restricted; that restrictions in the corridors hamper the flow of traffic into, out of and between the training areas; and that the PTA is difficult to access from certain directions owing to the presence of restrictions. In addition, they have indicated that the nature of the flying program has evolved so that more complicated scenarios demand a more restriction-free environment.

Below is a discussion of the avoidance program in terms of its design, its effectiveness in protecting the environment and the people using the land, its application and communication.

9.2.1 Managing the Avoidance Program

The avoidance program will continue to develop in the future as it has developed in the past; as such, it will require changes in criteria (sensitive areas and separation distances), in training area boundaries, in area- and time-specific boundaries and in openly accepted trade-offs between the basic objectives and potential impacts of noise. Although it will remain the most active participant, DND cannot supply all this; although expert in some of these areas, DND is not a wildlife management agency and is not best placed to manage much of this. There is room for the building of non-governmental institutions that can tap more of the resources of the community. Despite its efforts, DND has not achieved a sufficient level of trust with this program to be able to carry out the trade-offs that may be necessary — and perhaps never could, because of its rather intimidating presence. Trade-offs can be made only in an atmosphere of understanding and trust.

The panel concludes that it is unclear whether the dilemma of the "contradictory" objectives of environment and people protection and a viable low-level flight training program can be solved. However, it can be managed when all interests are involved, where there is a broad spectrum of professional and experienced advice and when there is a good measure of trust and credibility. DND by itself lacks the credibility and trust to do it. The panel reiterates recommendation 2, that the avoidance program be supported by an integrated program of monitoring and research managed by a new institution at arm's length from DND. It will be demanding to bring all these elements together and manage them effectively with the monies available, and more monetary resources may need to be sought from other sources, but it is the price of a truly viable future project.

9.2.2 Effectiveness

The avoidance program must be judged on its results. Is it protecting the environment, wildlife and people who are out on the land? The issues involved in identifying and avoiding critical groups and in developing the avoidance criteria are discussed in the following sections.

9.2.2.1 Identifying and Avoiding Critical Groups

Initially, avoidance closures were designated using constraint maps based on historical use. These were of limited use, as there was no assurance that people or wildlife were actually present within those areas. Now, many of the closures are based on "real-time" data, such as from a signal from a caribou satellite collar. A program based on real-time data is very costly. DND currently spends $1.27 million annually to determine where sensitive wildlife resources are located so that they can be avoided. Recently, some of these surveys have been done by other government agencies — for example, the Canadian Wildlife Service which conducts surveys for waterfowl.

a) Identifying and Avoiding Wildlife

For many wildlife species, the baseline data for habitat locations and population numbers are sparse. The effectiveness of avoidance as a mitigative measure is reduced because all potential habitats within the current training areas have not been surveyed for important wildlife species. More closures are being implemented as more areas are surveyed. In spite of an active monitoring program, there are still significant gaps in our knowledge of the distribution of sensitive species within the training areas. For example, although all participants agreed that concentrations of moulting and staging waterfowl should not be overflown because of potential negative impacts on the birds, there is little that can be done about it until we know where the concentrations occur.

Most of the criticisms about determining the distribution of wildlife species concerned either caribou or waterfowl and raptor populations. The distributions of these species change, requiring that up-to-date information be collected to evaluate exposure and to assess long-term displacement. Some review participants recommended further surveys of the number and distribution of the George River caribou and that existing caribou movement data should be analysed. Participants also recommended that more caribou wear either radio or satellite collars to provide more accurate plots of their distribution. A participant also indicated that the Red Wine caribou herd coalesces during the annual rut. Neither the locations nor movements of the animals associated with the rut are adequately known. As this period overlaps with active low-level flying, it was recommended that DND determine where concentrations occur and apply protective criteria.

DND agreed that if more caribou were collared, their movements could be more accurately plotted; however, DND commented that this would be very expensive and that application of more collars would disturb the animals. To help overcome the difficulties of identifying the location of caribou, DND implements buffer cell closures, which allow for movements of the George River herd caribou from main concentrations into the surrounding areas without being overflown. The size of the buffers is reduced when the caribou are thought to be less sensitive to overflights.

The review of the feasibility of the avoidance program, submitted by the Innu Nation, criticized the manner in which DND's consultants surveyed waterfowl habitat. Only areas of prime habitat were surveyed and integrated into the program, and these represent only about 5% of the low-level training areas. It was pointed out that the inclusion of additional waterfowl habitat (e.g. areas with average waterfowl densities) in the surveys may well have resulted in the designation of more avoidance zones for migratory waterfowl. DND officials agreed that a more comprehensive survey can provide a more precise delineation of habitat units, but that it is more time consuming and needs to include ground truthing of habitat types and verification of waterfowl use.

To date, DND has collected mainly population baseline data and very few data on effects. Even so, the program is costly, as up-to-date information must be secured on a continual basis. The avoidance program has demonstrated that it has difficulty accounting for the dynamic nature of various wildlife populations. Some of the participants recommended that the program shift from the avoidance of specific locations to the avoidance of habitat used by sensitive species, as a means to improve operational and cost effectiveness.

As a measure to increase cost effectiveness, DND proposes to increase the use of military aircrew sightings of wildlife as the basis for establishing wildlife closures. The reports on the feasibility of the avoidance program recommended that the effectiveness of this practice be demonstrated. It is felt that attempting to obtain data on wildlife on the basis of sightings by military aircrew is not feasible owing to the speed that the aircraft travel, the lack of training of aircrew in wildlife identification and their preoccupation with tactical and operational tasks. A review of past flight data forms demonstrated that out of 808 forms, only 2 wildlife observations were recorded. **The panel concludes that the use of military aircrew sightings as the basis for establishing wildlife closures is not likely to be effective.**

b) Identifying and Avoiding People

The intent of the avoidance program is to avoid low-level flying of all sites within the training areas that are known to be occupied by people. The panel was told that the avoidance of humans works well provided that the individuals co-operate. Outfitters and others with permanent camps who spoke at the hearings said that the avoidance program worked well for them. The panel was told that the Innu from Sheshatshit and Utshimassit have provided the co-ordinates of their camps to DND on a number of occasions but that the issuing of Operations Directives specifying camp locations has not prevented overflights. The Innu indicated that repeated overflights of a camp at Ashuapun occurred during the spring in 1992, even though it had been designated for avoidance in the Goose Bay Operations Directive 92-27 (May 22, 1992).

Avoidance of humans is complicated by their mobility when resource harvesting and the fact that DND cannot aggressively monitor their locations. DND states that the chance of overflight is small if the Base has been alerted of the location and times of occupancy. Knowledge about human occupancy is derived from the groups and individuals who use the area — requiring both updating of the harvesting data base compiled in 1987 and 1988 and communication among individuals and groups. Reporting by liaison officers and charter company pilots assist in avoiding resource users when they do not notify the Base of their location within the training area. DND was criticized for restricting data gathering to Labrador-based charter companies, preventing it from obtaining information on locations of camps of the Montagnais from La Romaine and Natashquan who harvest in LLTA-2.

Satellite transmitters were suggested as a means to track hunters and trappers in the training areas. That raised questions about the state of tracking technology, infringements on rights to privacy and the extent of the avoidance radius.

The panel concludes that the Innu have presented significant concerns about the impact of low-level flying on their health and social and cultural traditions. The panel recognizes that, although DND has some information on the location of Innu camps, the information is incomplete without Innu co-operation, without which Innu camps and hunters will continue to be overflown. Although the Innu seem to believe that their way of life and the Project cannot co-exist, the panel feels that there can be compromise.

As many people as possible, in camps and in aboriginal hunting parties, must be avoided by all the skilful ways that may be devised. Every method must be tried to reduce overflights. The panel's recommendation 22 in Chapter 5, proposing further study on the impacts of the Project on harvesting, will lead to more conclusive findings regarding the impact of noise on the land.

9.2.2.2 Implementation of Avoidance Restrictions

The ability to implement the restrictions is dependent on communication of information concerning avoidance areas to the Military Co-ordination Centre on the Base, and from there to the respective pilots. The panel was assured that the pilots are capable of avoiding restricted areas.

The panel was told that Allied crews required a minimum of four hours to incorporate new information from the Military Co-ordination Centre into flight plans. **The panel is satisfied that if accurate information is available to crews, the navigation equipment and skills are there to meet the avoidance criteria.**

9.2.2.3 Avoidance Criteria

Several participants spoke of the need to tie research priorities and management to effects research; and the need to integrate avoidance and specific effects monitoring studies. The panel heard that the criteria for avoidance should be part of an evolving program shaped by all groups affected by low-level flying. Currently, DND, assisted by federal and provincial wildlife agencies, designs and implements the monitoring and avoidance measures. Increased public input was recommended as the key to enhancing the avoidance program. It

was further recommended that the public be involved in determining program priorities and assessing program effectiveness. Some people feared that when trade-offs must be made or differences accommodated, the environment may lose out.

The panel concludes that all aspects of monitoring, research and recommended avoidance actions must be integrated — and run under the principles of the "3 C's" discussed in Chapter 8. The program must be overseen by all major users so that informed decisions about what and when to avoid, and what and when to overfly, can be reached by mutual agreement. The aboriginal people must be brought in, if they will come, as full and equal participants in a revised monitoring and research program. Only then will the fourth "C" of credibility be attainable.

The panel does not, at this time, support the lowering of avoidance criteria below those now in effect. However, it does recognize that DND may have been unnecessarily stringent in establishing criteria in the past on the basis of the limited information available at the time. Accordingly, there may be opportunities in the future to change or adapt the criteria as more reliable information becomes available. The panel believes that to be credible such judgments would have to be made on the basis of sound information and with the involvement of all stakeholders. Again, this is a task for the Institute once it is established and operating.

42. **Until adequate baseline studies have been completed in the new areas to be overflown, the panel recommends that flying continue to be conducted in the present low-level training areas with no reduction at this time in current avoidance criteria.**

a) Wildlife Criteria

The panel heard that the state of knowledge of the effects of low-level flying on wildlife, their level of tolerance and the likelihood of their exposure to disturbance is currently insufficient to resolve adequately key questions regarding the vulnerability of wildlife to disturbance. It is not known for most wildlife whether they are sensitive to noise and disturbance from low-level flying. There are no agreed-upon criteria with which to establish the distance of avoidance. Little effects monitoring has been done, and little is known about the potential longer-term effects of low-level flying. Critical questions about the effectiveness of avoidance criteria need more work, such as what species need to be avoided? When do they need to be avoided? What should the avoidance criteria be? Is avoidance feasible for the species in question?

At this time, it is not possible to determine if the avoidance program is producing the desired results. The scientific basis of the avoidance program remains weak. Data on the effects of military aviation noise on wildlife are not sufficient to determine whether wildlife is being affected or not, and, if so, in what ways. Science is currently limited in the extent to which it can isolate variables at work in environmental change. Although the panel heard that there is no clearly recognized damage to wildlife in the area from low-level flying and that the wildlife are as healthy as ever, the EIS states that there is potential for major or moderate adverse impacts. **The panel concludes that not only is avoidance prudent, it is essential. More basic information needs to be gathered on natural systems and wildlife. More research must be done on the effects of the Project on them, and more monitoring, including compliance monitoring, must be conducted.**

The panel heard that the ultimate goal of the avoidance program should be to avoid that which must truly be avoided. Because it is not possible to predict the future distribution of wildlife populations, avoidance is doomed to the recurring difficulties of reconciling military requirements with wildlife protection. A balance can be accomplished only if a rigorous, experimental, scientific program is incorporated into the avoidance program.

The panel notes that other types of military and non-military aircraft, such as helicopters, flying at low altitude may impact sensitive wildlife as much as or more than the training jets.

43. **The panel recommends that, through the Institute, a monitoring program address the potential impacts of low-level flying, other than Project-related low-level jet flying, on sensitive wildlife.**

The reports submitted by the Innu Nation were very critical of the manner in which avoidance criteria were determined. The reports stated that avoidance measures were political — intended to implement minimal avoidances of people and sensitive wildlife areas in order to meet public relations objectives while at the same time maximizing military flight training. The reports also stated that DND is more concerned about the impact of wildlife and people on low-level flying than the opposite, and thus that little protection is being given to sensitive wildlife or to Innu and non-Innu hunters and trappers. It said, DND acknowledges that there is little quantitative research on which to base spatial separation and that initial closures were not systematically applied. The panel recognizes that there must be trade-offs. The panel suggests that, by becoming involved in the Institute, the Innu can be full participants in determining what is avoided, how and when.

Several review participants recommended revisions to current and proposed avoidance criteria. The panel learned that the present avoidance criteria do not recognize that large sectors of rivers may be utilized by breeding pairs and subsequent broods of Harlequin Ducks. Access to high-quality habitat free of disturbance for brood rearing is as important as having high-quality habitat free of disturbance for pair bonding and nesting. It was recommended that rivers where the species occurs or potentially occurs during the May to August breeding period be avoided.

DND was criticized for reducing the Osprey avoidance criteria in 1993 when effects monitoring had not yet been initiated. Review participants recommended that current avoidance zones not be reduced until the relevant effects studies are completed and analysed. Some participants said that where avoidance criteria appear not feasible for various sensitive wildlife species and populations, like the Red Wine caribou herd and forest-dwelling raptors, effects monitoring studies

should be implemented soon. In addition, it was recommended that the calving areas of the Red Wine herd not be overflown at altitudes below 300 m AGL during the last week of May and the first three weeks of June. If it is not possible to avoid all areas of the calving range, it was suggested that corridors of permitted training activity be designed to minimize the number of females being overflown. The panel agrees.

44. **As it is not operationally feasible to avoid the entire calving area of the Red Wine caribou herd, the panel recommends that during the last week of May and the first three weeks of June, corridors of permitted training activity be designated in the calving area of the Red Wine herd to minimize the number of females being overflown.**

b) Altitude Criteria

One review participant indicated that the altitude criterion proposed seems to be arbitrary, as it has been demonstrated that a jet avoiding a Peregrine Falcon's nest at an altitude of 820-984 feet (250-300 m) may cause the adults to take flight. DND stated that because flights down to 1000 feet are permitted in uncontrolled airspace throughout Canada, it was considered inappropriate to impose a higher "floor" within the designated low-level training areas. With regard to all avoidance criteria, one DND expert pointed out that there is little research on which to base spatial separation. **The panel concludes that altitude criteria should be researched in regard to avoidance measures.**

c) Human Criteria

The mobility of hunters and trappers in the country makes the prediction of the spatial and temporal aspects of travel on the land extremely difficult when attempting to devise a successful avoidance program. The panel learned that the current 2.5-NM radius for camp avoidance provides protection to Innu women and young children who rarely travel more than that distance from camps, but it does not protect hunters and trappers who travel far greater distances from their camps.

The Inuit and Innu have both requested that blocks of hunting territory be avoided on a seasonal basis — blocks designed to take into account the often shifting and unpredictable character of harvesting activities. DND indicated that it is prepared to consider enlarging the avoidance radius around primary camps (if such an increase does not undermine the operational viability of the training program), to implement agreed-upon changes to avoidance criteria on a trial basis and to evaluate the merits of the changes jointly with concerned resource harvesters. DND also indicated that the only camps that are "mobile" over large expanses are those associated with caribou hunting, which are often associated with large groups of caribou that benefit from avoidance in their own right.

45. **The panel recommends that the Institute examine DND's proposals with respect to increasing avoidance of main camps and implementing block closures.**

Hunters along the Lower North Shore of Quebec requested that overflights be reduced during the period of the moose hunt (one month in duration in the fall) in the Lower North Shore area; or, failing this, that pilots cross the rivers during the moose hunt period, instead of flying along them.

46. **The panel recommends that avoidance of moose hunters during the fall hunt be examined in the review of the avoidance criteria to be conducted by the Institute.**

9.3 Implementation of Avoidance Criteria in Options "A" and "B"

The present low-level training area boundaries were set up many years ago and did not take into account ecologically sensitive areas, areas of high wildlife concentrations or areas of intensive resource harvesting. DND proposes that the training areas be reconfigured so that some of the most environmentally sensitive areas are permanently excluded from overflights. The avoidance criteria for the two proposals put before the panel — Options "A" and "B" — are discussed in more detail below. The boundaries of the low-level training areas in the two options and the requirements for the transition from Option "A" to Option "B" were discussed in Chapter 3. Table 2 provides a summary of the proposed avoidance criteria under Option "A" and Option "B."

Table 2
Summary of Option "A" and Option "B" Avoidance Criteria as Provided in the Revised EIS

Topic	Option "A"	Option "B"
Rationale	• reduces the scope of the existing wildlife avoidance program in order to make available sufficient "restriction-free" airspace to ensure the continued operational viability of the Project • retains protection only for those ecosystem components that are "highly valued" and/or that are predicted to be most affected by military overflights	• designed to provide avoidance comparable to the current practice by permanently deleting important wildlife and resource use areas from the existing LLTAs • permanent deletions are compensated by the addition of airspace in areas of lower value to wildlife and humans
Boundaries	• maintained with the two existing training areas of 100 000 km^2 • training program requires a minimum of 90 000 km^2 of unrestricted airspace at all times (need 90 000 km^2 for safety reasons. in case closures due to weather and to ensure enough space to conduct a variety of air exercises)	• reconfigured area covers an area of 130 000 km^2 (9000 km^2 consisting of an access zone to the Goose Bay Airport and a IO-NM exclusion zone around Churchill Falls is not included in this total) • a maximum 100 000 km^2 will be used for low-level flying at any one time — the area will be shifted within the outer boundaries as avoidance closures occur, in order to maintain 100 000 km^2 free of avoidance restrictions
Operational Requirements	• minimum width between the corridors between the Base and the LLTAs has been estimated at 15 NM given the distance that must be travelled to the LLTAs	• minimum width between the corridors between the Base and the LLTAs has been reduced from 15 NM to 7.5 NM because the distance between the Base and the training area has been reduced from 70 **NM** to 20 NM (because aircraft do not need to enter formation)
Areas That Cannot Be Closed	• two PTAs and their approaches with a moveable 180-degree, 20-NM-deep sector abutting the PTA • 15-NM entry corridors between Goose Bay and the LLTAs • corridors connecting the LLTAs • airport control zone (1 O-NM-radius circle around CFB Goose Bay)	• access to the PTAs must be restriction free in a 180-degree, 20-NM-deep sector abutting the PTA • airport control zone (lo-NM-radius circle around CFB Goose Bay) • 7.5-NM entry corridors between Goose Bay and the LLTAs
George River Caribou Herd	• avoided during periods of pre-calving, calving and post-calving • avoid 10 000 or more caribou, a density of 25 caribou/km^2 within a grid cell of about 484 km^2 or groupings of satellite collars	• a large tract of land in the northwest of the present LLTA-1 that is consistently used by the George River caribou herd during calving, post-calving and rutting periods is permanently excluded • concentrations of 500 or greater avoided • avoidance will be based on satellite telemetry and aerial surveys
Red Wine Caribou Herd	• avoided during late winter • the use of two camera target sites within the wintering range of the herd in the Red Wine Mountains will be restricted	• existing criteria will be maintained: avoided during late winter; spot closure of 5-NM-radius circle around sighting of group of 10 or more
Lac Joseph Caribou Herd	• not applicable (LLTA does not cover Lac Joseph herd range)	• no program is planned because most of the range of the Lac Joseph herd is located to the west of the adjusted training area

Table 2 con't
Summary of Option "A" and Option "B" Avoidance Criteria as Provided in the Revised EIS

Topic	Option "A"	Option "B"
Waterfowl	• no avoidance	• highest-quality breeding habitat permanently excluded from the training area • concentrations avoided during staging, breeding and moulting • baseline surveys will be conducted in new areas; surveys to establish the location of important habitat area will be continued • the criteria will be reviewed with the resource management agencies to ensure that they continue to meet the minimum requirement for protection
Raptors and Endangered Species	• full protection of the Harlequin Duck and cliff-nesting raptors during breeding periods • no avoidance of forest-nesting raptors • avoidance limited to species formally designated as endangered (i.e. Peregrine Falcon and eastern Harlequin Duck) and the rare Gyrfalcon and Golden Eagle • no avoidance of Bald Eagle and Osprey nest sites	• option permanently deletes a large area in the northeast of the present LLTA-1 that provides the most important breeding habitat for cliff-nesting raptors (Peregrine Falcon, Gyrfalcon and Golden Eagle) and Harlequin Ducks • surveys will be conducted to determine active nest sites for raptorial birds • monitoring surveys will be conducted
Moose	• no avoidance	• avoidance of concentrations in late winter
Tactical Transport Routes	• parts of the three tactical transport routes traverse areas outside the training area • surveys will have to be carried out along these routes because some of this area provides potentially high-quality nesting habitat for cliff-nesting raptors, as well as for Harlequin Ducks	• as in Option "A," parts of the three tactical transport routes traverse areas outside the training area * surveys along these routes will be carried out to locate nests of raptors and breeding areas of Harlequin Ducks, in addition to similar surveys within the training area
Resource Users	• in "high-use" areas, resource users will be avoided by setting a 1.O-NM radius around the main camp • in all other areas, occupied base camps will be avoided by 1 .O NM, if possible • for communities that did not participate, the same approach will be used except that the high-use areas will be defined based on secondary data	• in "high-use" areas, resource users will be avoided by setting a 3.0-NM-radius (96 km^2) restriction around the main camp • in the "known-use" areas, avoidance will be reduced to 2.5 NM • in all other areas, occupied base camps will be avoided by 1 .O NM • for communities that did not participate, the same approach will be used except that the high-use areas will be defined based on secondary data
Native Liaison Officer/ Community Liaison Officer	• the Native/Community Liaison Officer will visit all communities as a minimum on a 4- to 5-year cycle to update the high-use harvesting areas, and any changes will be presented to the Resource Users Advisory Group (RUAG) during annual meetings	• the Native/Community Liaison Officer will visit all communities as a minimum on a 4- to 5-year cycle to update the high-use harvesting areas, and any changes will be presented to RUAG during annual meetings
Outfitting and Adventure Tourism	• the main camp of existing outfitting camps will be avoided by 1 .O NM • future outfitting camps will be avoided by 1 .O NM, if possible • avoidance of adventure tourists will be determined on a case-by-case basis	• the main camp of the existing outfitting camps will be avoided by 2.5 NM • the main camp of future outfitting camps will be avoided by 1.0 NM • the possibility of avoiding adventure tourists will be determined on a case-by-case basis

9.3.1 Option “A”

Under Option “A,” the current flying area boundaries would be maintained, but the avoidance criteria would be reduced so that closures never exceed 10% of the low-level training areas. DND stated that maintenance of current avoidance standards within the existing training area boundaries would not be possible with an increased number of flights. DND proposes that there be a review of the existing closure criteria to determine where they should be reduced. It also proposes that there be a priority established for avoidance closures and also guaranteed protection measures — for example, for rare and endangered species and for the George River herd calving area, when it is occupied.

Greater residual impacts are predicted as fewer species are avoided, and those that are avoided will have reduced levels of protection. Even with reduced avoidance, DND predicts that there would be continuing pressures on the viability of the training program and on some of the species.

The success of Option “A” also depends on the extent of airspace closed to protect wildlife within the training areas. Once an area in excess of 10 000 km^2 is closed to protect wildlife, the protection of sensitive species such as Gyrfalcon and Golden Eagle may be lifted entirely. Review participants were concerned that areas preferred for flight training, such as the river valleys containing important raptor habitat, will be the first areas opened to overflights.

Several review participants stated that the proposed reduction in the current avoidance criteria is unacceptable.

9.3.2 Option "B"

Under Option "B," the training area is increased to 130 000 km^2 and reconfigured; of this, only 100 000 km^2 is to be made available for military flying at any given time, giving greater flexibility for flight training. Once closures reach 40 000 km^2, avoidance criteria would be modified to ensure that military flight training can continue.

Option "B" eliminates the George River herd calving range and most of the seasonal concentrations (pre-rut, rut and winter periods), eliminates the Harp Lake calving grounds, removes known primary nesting habitat of cliff-nesting raptors and removes most known breeding habitat of the Harlequin Duck. It also moves the southern boundary of the low-level training area farther away from many of the Quebec Lower North Shore communities.

Many participants at the hearings indicated that they support Option "B" because it provides better protection for wildlife and because its greater flexibility could provide better avoidance for people on the land. DND prefers Option "B" from operational and environmental perspectives.

Although it addresses many of the operational problems of the avoidance program, Option "B" poses other challenges. The range of the Red Wine caribou herd is now completely contained within the flying area, and a portion of the calving area of the Lac Joseph herd would now be overflown. Option "B" contains more migratory waterfowl and more potentially sensitive habitats for them. It also raises questions about land uses and the interests of land users in this large “new” area. Potential impacts of low-level flying will be shifted more towards regions traditionally used by the Innu.

There are no permanent settlements within the current low-level training area. Under Option “B,” this would no longer hold true. The Town of Churchill Falls would be contained within the reconfigured training area. DND has proposed the placement of a lo-NM-radius military flying exclusion zone around the town so as to avoid any conflicts with the people living there. The residents of the town, when questioned by the panel, generally believed this zone to be adequate. One individual did request that the radius of the zone be increased to 20 NM.

47. **The panel recommends that the proposed 10-NM military flying exclusion zone around Churchill Falls be implemented upon the reconfiguration of the low-level training area. The size of the zone should be examined periodically by the Institute and adjustments made as required.**

9.3.3 Feasibility of Options “A” and "B"

Some review participants were concerned about the difficulties in reconciling operational feasibility and environmental protection in the proposed Option “B.” DND was criticized for failing to provide an adequate demonstration of the feasibility of its mitigation program as it pertains to Options “A” and "B." DND did not assess the impact of aggregate closures on specific geographic locations or the impact of multiple inviolate avoidance on PTA use and may have underestimated other avoidance restrictions in Option "B."

The description and analysis of Option “B,” including the description of basic resources in the area and land use, were less developed than in Option “A.” At this time, there is not enough information to determine the impact of avoidance closures on military flying operations within Option “B.”

Notwithstanding, the panel believes and shares the view of participants at the hearings that Option "B" is the preferred option, with some conditions about how the transition from “A” to "B" should be managed. The exact boundaries of that area may change. As an example, during the hearings, DND offered to remove the extension of the Option "B" boundary, north of the villages of Sheshatshit and North West River. Boundary changes should be subject to open discussion and decision through the Institute. This was discussed in more detail in Chapter 3.

9.4 Compliance

During the hearings, various people reported low-level overflights within and near to the low-level flying areas. One participant reported overflights below the 2000-foot cap over the community of Mud Lake. The avoidance feasibility reports submitted by the Innu Nation indicated that 7 of the 10 Innu camps in LLTA-1 and the corridors in the spring of 1992 reported frequent overflights either directly overhead or within a

2.5NM radius. According to the report, DND was aware of the locations of these camps. Based on this, the Innu believe that sensitive wildlife areas are also being overflown. Another review participant compared sortie distribution data with caribou avoidance zones during a portion of the 1990 season and determined that 13 of 211 jets (6%) flew where they were not supposed to.

DND officials stated that wilful straying incidents are unlikely, as it costs in excess of $10 000 per hour to fly the jets, the training is intense and the time in which to train is short. Pilots are warned that there is a zero tolerance policy regarding wilful breaches of Air Discipline, which include violation of environmental restrictions.

Detailed flight plans are filed and entered into the GIS after each flight. DND has the capability to monitor daily whether there are violations of the imposed restrictions. DND recognizes that inadvertent overflights of restricted areas may occur but is confident that the rate of occurrence is below 1%. Compliance monitoring is discussed in more detail in Chapter 10.

The panel heard that public confidence in the operation and effectiveness of the avoidance program could be improved by requiring DND to publicize the results of the avoidance program. This should include the number of complaints received yearly, the results of any investigations and the actions taken as a result of the investigations.

48. The panel recommends that information be regularly transmitted to the public on the work being done by the Institute, the changes to the avoidance program and results of research and compliance auditing.

9.5 Communication

The issue of communication was raised at the hearings with respect to DND's avoidance program. There was considerable discussion on the roles of the Community and Native Liaison Officers staffed by DND and on the Resource Users Advisory Group (RUAG). **The panel found that, at present, few people know much about the avoidance program.** Panel recommendations on these areas are found in Chapter 11.

10.0 MONITORING AND RESEARCH

Monitoring has been viewed by environmental assessment practitioners as an essential part of the EIA process for many years. Unfortunately, it has not always been successfully practised. Much of the difficulty has been associated with limitations in EIA processes. Often monitoring was not performed once a project was approved and put in place.

Avoidance, effects and compliance monitoring were discussed during the review. Each of these is discussed below. In addition. baseline studies are also addressed.

Through written submissions and participation in the public hearings, various individuals and groups put forward a large number of recommendations for baseline studies needed to fill data gaps and to answer particular Project-related environmental concerns. These recommendations ranged from suggestions for monitoring to identifying specific research programs. The panel reviewed these proposals and compared them with the outcome of its own deliberations. The resulting conclusions and recommendations are presented here.

It is the panel's belief that the proposed Labrador Institute for Environmental Monitoring and Research (Chapter 11) would be the best forum for selecting and designing the studies to respond to these recommendations. The panel has indicated throughout the report where it feels priority should apply.

10.1 Baseline Studies

Baseline data refer to the description of conditions existing before development, against which subsequent changes can be detected. Baseline studies represent a first look at the project-area environment (for a brand-new project) or a focussed look for something new in an ongoing project. It is a one-shot deal that characterizes the existing environment at the time of the study. Baseline studies will tell which components have to be dealt with and where they are located at the time of the survey.

Decisions on research studies and on what/when/how to monitor all come after the baseline work and generally cannot be combined with it. All of these later activities are aimed at detecting any projected-related change that might occur, as measured against the baseline conditions.

Although baseline work cannot usually be combined with monitoring studies, some monitoring results provide useful information for the baseline.

The panel acknowledges the positive effect that the Project has had in generating new information on the biophysical environment of the Quebec-Labrador peninsula. Baseline studies and monitoring surveys undertaken by DND and by participating federal and provincial government agencies have contributed substantially to the data base for this region. Without the Project, much of this work would not have been done. Nevertheless, gaps do exist in baseline data, and some aspects of the monitoring program would benefit from better focus and more co-ordination.

The panel concludes that environmental baseline data in the reconfigured flight training area, Option "B," are currently inadequate as a basis for developing avoidance mitigation and/or judging Project impacts through monitoring change.

10.2 Avoidance Monitoring

Avoidance monitoring is the term used by DND to describe the collection of data that will allow for the avoidance of the valued ecosystem components identified in the EIS. The goal of DND's avoidance monitoring program is "to provide operational viability to the Project while ensuring the incorporation of sound environmental protection and management practice." DND's avoidance monitoring program is based on the premise that in order to avoid valued ecosystem components, one must know either the location or the status (or both) of these components. Avoidance monitoring surveys can be used to update baseline data.

Avoidance monitoring involves the acquisition of "real-time" data on the movements and locations of numerous wildlife species. The program was structured so that DND would continue to collect this information throughout the life of the Project. DND has already developed contacts with federal and provincial government departments to assist in the setting up and carrying out of many of the proposed avoidance monitoring studies for wildlife.

DND noted that, under mitigative Options "A" and "B," there would be different requirements-on the avoidance monitoring program as a result of the new training area boundaries. It was suggested that avoidance monitoring under Option "B" would require fewer resources for the monitoring of the George River caribou herd and raptor concentrations. However, the freed resources would be required to monitor the increased amount of human activity within the training area.

The development and effectiveness of the avoidance monitoring program were discussed in more detail in Chapter 9.

10.3 Effects Monitoring

Effects monitoring is undertaken to reduce uncertainty in predictions. It tests the accuracy of the predictions and hypotheses made during the environmental assessment and evaluates the effectiveness of the mitigative measures so as to ensure the protection of valued ecosystem components. Effects monitoring involves decisions on what, where, when and how values are studied. The effects monitoring program proposed by DND also attempts to detect any cumulative effects that might result from the Project. These objectives are accomplished through repetitive measurements of variables in the environment so that the state of the system can be evaluated. The effects of low-level flying can be tested directly, because the number and direction of the flights can be manipulated in non-permanent and reversible ways.

Although many review participants recognized that science is currently limited in the extent to which it can isolate variables in environmental change, they felt strongly that the attempt should be made. They were frustrated by the overall lack of effects monitoring of low-level flying to date and were concerned that at the end of the day we still would not be any wiser about the degree to which low-level flying has impacted on wildlife or habitat.

The ultimate goal of effects monitoring should be to avoid that which must truly be avoided. A series of 21 studies was proposed by DND to be conducted as part of the program. As with the avoidance monitoring program, priorities of the various studies changed under the two mitigative Options "A" and "B." The EIS states that the studies would be conducted with the input of local residents and their results passed on to all interested parties.

One group suggested that overflights in areas now avoided could be accepted provided that there is an agreed-upon monitoring program designed to identify key indicators of early trouble.

It should be noted that monitoring does not provide the interpretation of the measurements. The interpretation is conducted by the group or groups that are managing the Project and its interaction with the environment. Decisions are then taken as to how impacts can be further addressed if necessary.

A component of DND's monitoring program was the proposed creation of a Steering Committee. Its role would be to assume all responsibility for the effects monitoring program and the prioritizing of all studies to be conducted. It would ensure that a peer review of all study proposals was conducted prior to making recommendations to DND on the implementation of the studies. The review of the study results would follow a similar procedure, with the Steering Committee revising the research priorities of the program accordingly. The panel is convinced that the proposed Institute would be more acceptable and successful.

10.4 Compliance Monitoring

Compliance monitoring determines if the mitigative measures, as designed, are actually being implemented. It is aimed at checking out how well the proposed mitigation is being carried out and how well other regulations are being applied. DND created a GIS for the purposes of compliance auditing or monitoring. Initially, the GIS was used mainly as a library of the monitoring and constraint maps generated during the low-level training season. This information was to be used in monitoring the compliance of low-level flying activities to the restrictions and constraints placed on the activities. Through much work, the GIS has now grown into a powerful tool to support the management of the Project. DND admits that it is only beginning to realize the potentials associated with the GIS and expects its role to continue to develop in the future.

It is the panel's belief that compliance auditing must continue in the future. It is one of the ways in which to assuage the public's general perception that what was supposed to be done was not being done. In addition, a third party conducting the compliance monitoring would boost the public's trust.

49. The panel recommends that compliance monitoring be conducted by the Institute for all activities associated with low-level flight training in Quebec and Labrador.

As a bonus, the continued development of the GIS would enable the use of this potentially powerful tool for tasks other than just compliance monitoring.

50. The panel recommends that the Geographic Information System continue to be used to support the compliance monitoring of low-level training activities and that other uses continue to be investigated.

Inherent in the above two recommendations is the necessity for the Institute to have access to the GIS.

10.5 Need to Restructure the Monitoring Program

As the proponent, DND has put forward what it believes constitutes a valid monitoring program. During the course of the review process, the panel had numerous submissions and presentations that both criticized and applauded DND's work. Questions were continually asked as to the proposed mitigative measures, avoidance and its effectiveness at reducing the potential impacts from low-level flying activities; and what the real impacts were from the Project both for humans and wildlife and for the land and water of the area. The panel therefore thinks it necessary to highlight several of the suggestions put forward by the public and DND.

10.51 Co-ordinating the Monitoring Programs

A number of participants in the public hearings suggested that the avoidance and effects monitoring programs should be more closely co-ordinated. These programs have the common goal of providing supporting information to the Project. Although it is true that co-ordination is desirable, the programs do have different objectives and require different approaches. The objective of avoidance monitoring is to locate the environmental components that are to be avoided by low-flying aircraft. These components are of two basic types: (1) wildlife concentrations, whose locations are generally, but not precisely, the same from year to year, so that they must be located regularly during the flying season; and (2) components that are stationary, but may have a different status from year to year, such as raptor nests, which may be active one year and inactive the next. In this second type, it is the status rather than the location that is the focus for avoidance.

When the components to be avoided are determined, mitigation strategies are put in place. In other words, the component is avoided for a particular period of time or by a particular distance. These avoidance criteria are intended (and predicted) to minimize or prevent adverse impact.

The objective of effects monitoring, on the other hand, is to evaluate the impact of the Project on the environmental components. In practice, this generally involves testing the accuracy of impact predictions and examining the effectiveness of mitigative measures. It is obvious that effects monitoring is much more varied than avoidance monitoring. Effects monitoring may seek answers to questions of Project-related interaction with air, water, soil, vegetation, wildlife resources, etc.; most of these components will not require avoidance monitoring procedures.

Certainly the information from effects monitoring must be fed into the avoidance monitoring program, and it may lead to alteration of avoidance practices.

51. The panel recommends that avoidance and effects monitoring programs be integrated for the sake of cost effectiveness and efficient project management.

10.5.2 Involvement of All Parties

The panel was made especially aware of the need for the Involvement of all interested parties, not just government departments, in the overall monitoring of the low-level flying activities. DND's attempt to include aboriginal groups like the LIA through a formal arrangement like an MOU was deemed positive, but fell far short of expectations.

In order for all parties to participate willingly in the program aimed at protecting the environment, DND would have to assure that these parties would be involved as equals with itself. This would enable the parties to have an input into the various decision-making processes currently viewed as being politically oriented. Trade-offs would then be based on consensus of all the groups and not just a few. This would be especially important in the prioritizing of effects monitoring studies and the review of avoidance criteria and measures. Independent technical experts should also be involved at the outset of a project to help in designing baseline and effects monitoring studies.

The desire to be involved as equals was not viewed by the panel as an attempt by groups to impair the viability of low-level flying activities. Rather, it was based on the belief that access to traditional ecological knowledge and understanding of the environment could lead to a better project. Avoidance for the sake of avoiding was not seen as being constructive mitigation of impacts.

52. The panel recommends that, in an attempt to ensure the best protection to the environment, all parties (aboriginal, non-aboriginal, federal, provincial, DND) be involved as equals in the decision-making and review process for the overall monitoring program.

53. The panel recommends that all parties be involved in the setting of objectives for the future monitoring program and the evaluation of acceptable levels of impact.

10.5.3 Evaluation of Impact Predictions and Mitigative Measures

The technical hearings provided the panel with considerable information on how to, and how not to, evaluate the impact predictions made in the EIS. There was agreement that in order to determine the actual impacts associated with low-level flying activities, there was a need for controlled studies in the effects monitoring program. There was also a need to determine how effective the avoidance measures put in place by DND were in protecting the identified valued ecosystem components.

The panel recommendation to shift the training area boundaries gradually to mitigative Option "B" provides a good opportunity for such monitoring studies to be carried out. Following collection of baseline data, gradual movement to Option "B" would enable researchers to conduct studies under three conditions: no low-level flights, flights with avoidance measures and flights without avoidance. Assuming the careful postulating of hypotheses prior to the monitoring effects studies, the results could then be applied to the redesigning of mitigative measures and the proposals for future studies.

54. The panel recommends that research and monitoring studies relating to control and experimental situations in the Option "B" configuration be given a high priority by the Institute. Any research carried out must have practical application and not be just "pure" research; the findings are to support an adaptive management approach for the Project.

10.54 Allocation of Funding for Monitoring

DND sees that there is a need for the avoidance and effects monitoring programs to be blended together in the future. It stated, however, that it was hesitant to commit itself to too much before the review process was completed. DND has committed funds, through Allied and Canadian contributions, of up to $1.5 million a year, to be applied to the combined program. This would total about $22 million over the course of the proposed 15-year MMOU. The percentage of monies to any one program changes with the selection of mitigative Option "A" or "B." Until effects monitoring is put in place, the current funding of $1.27 million annually is directed to the collection of data for avoidance monitoring.

The panel heard from several sources that the fixed annual budget for monitoring makes little sense from an impact point of view and that the budget should be adjusted so that the bulk of studies can be carried out in the first few years of the Project. For example, studies on the Harlequin Duck are not scheduled to be carried out until years 1 l-l 5. Participants felt that determining the effects after 15 years would not do much for these ducks and that the goal should be to put suitable mitigative measures in place as soon as possible.

A few participants noted that the operational costs of using military aircraft in the experiments were high and did not appear to be factored into the proposed monitoring costs. They questioned the willingness of Allied air forces to participate in

experiments. DND indicated that the Allies are willing to participate provided that there is a reasonable research plan put forward, with sufficient time to plan, so that resources can be allocated.

It became apparent to the panel that, despite DND's commitment to $1.5 million per year over the life of the proposed MMOU, this amount of money would not be enough. There was also the problem that the money would be available only as a constant amount, and not as a pool of $22 million to be spread out over the 15-year MMOU.

Although there are savings to be had through the integration of the two monitoring programs into one, this again would not be enough. It was quickly realized that the availability of monetary resources could seriously influence the priority levels associated with any effects monitoring studies. As DND stated that it would not be able to provide the money, other than as a constant flow, the panel saw the need for other sources of funding. This is discussed more fully in Chapter 11. In addition to recommendations made in that chapter,

55. **The panel recommends that the funding DND has committed to the future overall monitoring program, $1.5 million per year for the life of the new MMOU, be indexed to inflation.**

11.0 THE LABRADOR INSTITUTE FOR ENVIRONMENTAL MONITORING ANDRESEARCH

Throughout this report, the panel has often referred to the Labrador Institute for Environmental Monitoring and Research as the suggested group to make decisions and recommendations on a variety of issues. The reader may ask, why the Institute and not DND? Why create a new agency? Why should scarce funding be used by someone other than DND? The panel believes the answer is clear and sets out its reasoning in the following discussion.

The Institute is designed to foster a level of trust among all groups affected by low-level flying activities in Labrador and Quebec. It will operate at arm's length from the Project and DND and will treat all groups as equals. The Institute would be able to develop more imaginative and effective ways of using existing resources. As well, the Institute will be positioned to seek funds from sources other than DND. It is the view of the panel that the cost of the Institute is part of the price of protecting the environment while keeping low-level flying activities in Labrador and Quebec operationally viable.

The Institute would not carry out a regulatory role. It would decide on research and monitoring programs, but these would be carried out by universities, consultants, DND and/or the responsible governmental agencies. The Institute would decide on mitigative measures, avoidance criteria and changes to the boundaries of the training area. It would then make recommendations, for implementation by DND or other responsible agencies. The Institute would not be given any of the legislative or management prerogatives of existing agencies. It would be a research-oriented, consultative, advisory, public education and information body.

The panel feels that it would be wrong to approve the Project without establishing the Institute, as they are inextricably linked.

11 .1 Underlying Principles

The panel believes that the following principles must apply to the management of the Institute:

- Its functioning must not in any way prejudice or delay the settlement of native land claims.
- It should not impair DND's objective to maintain a viable flight training program for the Allies, unless results of cause-and-effect studies show that significant impacts are occurring that cannot be mitigated or justified.
- It should sponsor only studies of an applied nature relevant to the training area and in support of adaptive management.
- It should be independent of government.
- Decisions should be reached by consensus.
- It would have its own operating budget, consisting of DND and Allied funds transferred to it and other monies secured from federal and provincial government agencies and other sources.
- Accountability will be to the governments and to the users.
- Aboriginal groups that have been largely marginalized in the past must become full and equal members of the process, and their traditional ecological knowledge and experience should be integrated into the process.

The panel is of the view that the "3 C's" principles promoted at the hearings with respect to the formation of a George River Caribou Herd Management Board should also apply with respect to the Institute. The panel believes that the need for a judicious choice as to the composition of the Institute's Board of Directors, for strong two-way communication between the Institute and the public and for consensus decision making in a co-management setting is just as compelling. These principles were discussed in detail in Chapter 8. At stake is the direction of a multiyear and multimillion-dollar program of studies designed to test the accuracy of the impact predictions, to refine the mitigative measures, to detect possible cumulative effects and to implement adaptive management as required.

11.2 Purpose of the Institute

Based on the presentations and submissions received during the review process, it is the panel's view that the purpose of the Institute would be as follows:

- review the priorities of the studies proposed that flow from the review process and the panel's recommendations;
- propose, sponsor and co-ordinate new studies to determine potential adverse impacts of the Project;
- assess the results of the studies carried out, including a peer review;
- undertake appropriate follow-up action based on study results;
- decide on appropriate changes to the monitoring program;
- review the avoidance program and, if necessary, recommend changes to the avoidance criteria to increase, decrease or eliminate protection measures;
- advise the federal government on the release of new airspace and on the transition of the training program from the Option "A" to the Option "B" configuration;
- review annually the effects monitoring studies and, if required, recommend adjustments to the configuration of the training areas;

- review DND suggestions about the siting of a second PTA and make recommendations to the Government of Newfoundland and Labrador;
- set up technical committees with the required expertise to study specific subjects;
- ensure a regular two-way flow of information between the Institute and the public (i.e. to inform the public about the Institute's work and to receive public input); and
- recommend to the federal government that military flying activities be limited or phased out if results of cause-and-effect studies indicate that significant impacts are occurring and cannot be mitigated or justified or if avoidance measures are necessary that would prevent the flying program from being a viable operation.

11.3 Structure of the Institute

The panel believes that the institute should be an incorporated body, run by a Board of Directors consisting of representatives from at least the following groups: Labrador Inuit, Montagnais of Quebec, Naskapi of Quebec, Labrador Innu, Labrador Métis, Inuit of Nunavik, the Government of Canada (DND, Environment Canada, Department of Indian Affairs and Northern Development and others if necessary), the provincial governments of Quebec and Newfoundland and Labrador, non-native resource users, the Town of Happy Valley-Goose Bay, the combined Councils of Labrador and the academic community.

Ideally the Institute should be as independent as possible. Initially the Board of Directors would report to the federal Ministers of the Environment and National Defence. Once in full operation, the Institute's reporting relationship will likely evolve.

Although DND will be a major source of funding for the Institute, the panel does not consider it appropriate for DND to initiate the establishment of the Institute. **The panel believes that the recipient departments of this report, i.e. DND and Environment Canada, should jointly hire an external non-government consultant to act as a facilitator with respect to the establishment of the Institute.** The facilitator should initiate the establishment of the Institute pursuant to the panel's recommendations, up to the point where the Board of Directors is appointed. This would include drafting a formal agreement that would detail the Institute's objecttves, the responsibilities of the Board of Directors, the Board membership and Board rules and procedures. The facilitator would then identify and contact Board candidates in an attempt to get all groups Identified above represented. The facilitator would provide a copy of the draft agreement for the consideration of Board candidates. After a thorough solicitation of candidacies, the facilitator would make recommendations to the Ministers of the Environment and National Defence, who would then appoint the Board of Directors. The agreement would eventually be signed by all parties and would indicate the financing granted to the Institute by governments, as well as the budgetary and financial audit requirements.

The Board of Directors would choose its President from among its members, and the position would rotate periodically. An Executive Director would be identified by the Board of Directors and hired by the Institute on a full-time basis to be the chief administrator of the Institute. At a minimum, administrative and secretarial support would be provided to the Executive Director.

Given the commonality of several objectives of both the Institute and the proposed George River Caribou Herd Management Board (see Chapter 8) and the need to co-ordinate efforts in research, avoidance, mitigation and compliance monitoring, it is recommended that at least four or five of the Directors hold dual appointments. Likewise, some technical experts may be members of committees serving both bodies. The advantage of this idea would be to save time and money and provide the comprehensive approach advocated by the native people of Newfoundland and Labrador. It also highlights the action or problem-solving work style that is envisaged in which trade-offs will be made and members are prepared to abandon fixed positions because they feel they are partners in an open, fair process. Communication is thus made easier, as is consensus building, leading to renewed commitment and credibility.

56. **The panel recommends that the federal government appoint an external consultant to initiate the establishment of the Institute, up to the point where the Board of Directors has been selected. The Institute's Board of Directors should include representatives of the organitations and groups listed in this report and represent the interests of all resource users, of governments and of the academic community. In order to ensure integration of efforts, some of the Institute's Directors would also hold similar appointments on the proposed George River Caribou Herd Management Board.**

The panel firmly believes that a professional institute, run in an expert and objective manner and bringing together the varied perceptions of resource users, of government and of the academic community, is absolutely essential to have a viable flight training program and a credible, publicly supported environment management and protection plan.

The creation of the Institute would not relieve federal and provincial government departments from meeting their obligations with respect to wildlife resources and habitat. The Institute should be seen by governments as a tool to facilitate their job, given that one of the objectives of the Institute is to reconcile adversarial relationships and foster teamwork. Governments would not relinquish any of their legal powers — they would work co-operatively with resource user groups to achieve common objectives set out in an agreement freely assented to by all parties.

11.4 Funding the Institute

Although the Government of Newfoundland and Labrador felt that DND's $1.5 million annual allotment was a significant and

adequate amount, several groups questioned whether this would cover mitigation and monitoring. Some participants asked that more funds be made available early to finance baseline research in addition to effects monitoring.

The panel believes that there will be a need for more funding over and above DND's annual commitment of $1.5 million in the early years of the Institute.

57. The panel recommends that:

- **DND's commitment of $1.5 million be directed towards the establishment and operation of the Institute.**
- **Funds at least equal to the Allied contribution to DND funds be provided by other federal and provincial agencies.**

These funding requirements should be viewed in the perspective of the significant financial contribution by the Allies and the economic impact of the Project on the region.

As required, the Executive Director and the President of the Institute should solicit funds from other sources. The panel is optimistic that other sources, such as research granting agencies and foundations, exist that would be willing to dedicate resources for innovative and exciting initiatives such as this one. In particular, projects designed to preserve wilderness areas and wildlife currently enjoy favour and receptivity.

The Institute's budget should include resources to cover the honoraria and travelling costs of native and community representatives on the Board and technical committees. Salary and travel expenses of other Board and committee members would be covered by their sponsors.

11.5 Communication

The issue of communication was raised at the hearings with respect to a mitigation and monitoring committee that might be established. As discussed under the "3 C's," consideration of traditional ecological knowledge and cultural values is an essential part of communication. The panel believes that the proposed Institute will address these concerns.

Several groups and individuals requested better communication between DND and the communities. **The panel believes that improved communication with the towns of Labrador City, Wabush and Churchill Falls will be essential with the adoption of the Option "B" configuration, as it would bring military flying activity closer to these communities.** These communities specifically requested that they be at least informed of the monitoring studies that are being conducted and receive the results of those studies on an annual basis.

As part of the avoidance program, DND appointed a Native Liaison Officer and a Community Liaison Officer to conduct community visits, establish contacts in each community and maintain liaison by telephone in order to develop an information base on resource use within the training areas. These Officers also staff two toll-free phone-in lines that allow all land users to advise DND of their activities and their location on the land within the training areas.

During the hearings, the panel heard from participants who had never seen or heard of the Native and Community Liaison Officers and were unaware of the toll-free phone lines. One presenter indicated that the casual visits by the Liaison Officers are not adequate to address the ongoing and not-so-sporadic overflights of Mud Lake. It was suggested that the Native and Community Liaison Officers hold a public assembly, which could be supplemented with private meetings. Another presenter suggested that there be a contact person in each community where there are resource harvesters using the low-level training areas.

DND agreed that an increase in the current level of communication with communities outside of Happy Valley-Goose Bay is warranted but cautioned that more money spent on communication would result in less being available for the balance of monitoring and mitigative measures.

The panel concludes that the functions of the positions of Native and Community Liaison Officers may appropriately belong in the Institute, and consideration should be given to transferring them there in due course.

The RUAG was created by DND as part of the avoidance program. DND indicated that the purpose of the RUAG is to foster greater understanding between those who make use of the land within the training area and those involved in military training. The RUAG was created to provide a forum where resource users in the training areas can share information on their activities with DND. It was also intended to provide an opportunity for the resource users to raise concerns or complaints about the military flying program, for the resource users to meet with representatives from the Allied nations using CFB Goose Bay and for DND to pass along information. There is one RUAG group for Labrador, and another for Quebec. The Quebec RUAG first met in November 1993. Meetings are held annually.

LIA has refused in the past to be a participant in the RUAG, because it feels that the group does not meet often enough to be effective.

DND's own assessment of the RUAG is that meetings afford local resource users only a limited opportunity to exchange information with DND personnel responsible for the conduct of flight training. It was indicated in the revised EIS that the RUAG structure does not appear to have been conducive to the constructive discussion of resource use priorities within the low-level training areas or to the updating of resource use mapping.

Although the revised EIS contained suggestions for improvements, the panel believes that the RUAG will become redundant given the proposed Institute.

58. **The panel recommends that the Resource User Advisory Group be collapsed in light of the role to be played by the Institute. The panel also recommends that resources allocated for the Resource User Advisory Group be put towards the implementation and operation of the Institute.**

11.6 Possible Overlap with Existing Institutions

During the course of the review, the panel became aware of the existence of the Labrador Ecosystems Analysis Facility, an organization established by Memorial University of Newfoundland. The mission statement of the Labrador Ecosystems Analysis Facility is to "conduct and promote multidisciplinary scientific research on ecosystem, environmental quality and natural resource matters relevant to the ecological, social and economic conditions of Labrador such that enlightened stewardship and management of Labrador resources will be possible."

Although the purpose of the Labrador Ecosystems Analysis Facility is not directly related to military flying activities, as is the **case** with the Institute proposed in this report, the panel notes that the two institutes share many common general objectives.

The panel concludes that it would be prudent for the facilitator hired to initiate the establishment of the Institute to contact the administrators of the Labrador Ecosystems Analysis Facility, to determine what linkages or sharing of resources, if any, could be made between the two institutes. Final decisions on linkages or sharing of resources should be made by the Board of Directors of the Labrador Institute for Environmental Monitoring and Research.

12.0 RECOMMENDATIONS

12.1 Building Bridges

1. The panel recommends that the federal government approve proposed military flying activities in Labrador and Quebec subject to the recommendations in this report.

2. The panel recommends the establishment of the Labrador Institute for Environmental Monitoring and Research, whose function would be to advise on the terms and conditions governing low-level flying, including avoidance criteria, mitigative measures, boundaries of the low-level training area and Project-related land uses in the training area. The institute will manage a program of research and monitoring in support of this advisory role. The Institute must be established prior to the signing of a new MMOU.

3. The panel recommends that, given the perception of the aboriginal groups that the Project negatively influences their land claims negotiations, the federal and provincial governments settle aboriginal land claims quickly.

12.2 Project Component Issues

4. The panel recommends that low-level tactical transport routes be established within the boundaries of the training areas and that avoidance criteria be applied accordingly.

5. The panel recommends that DND, in renegotiating the MMOU, strive to increase the opt-out provision to a minimum of two years.

6. The panel recommends that no takeoffs or run-ups associated with low-level flying be carried out after 11 p.m. local Goose Bay time.

7. The panel recommends that Option "B" airspace with flexible boundaries be accepted as the preferred option for renegotiation of the MMOU in 1996.

8. The panel recommends that a baseline study program be implemented immediately so that sufficient data are available before low-level flights are switched to the new training area.

9. The panel recommends that DND give priority to field work in 1995 that will ensure that new airspace is available for Allied flying by the beginning of the 1996 season.

10. The panel recommends that the Institute review and recommend boundary changes and release of new airspace prior to any approval being granted by the appropriate agencies.

11. The panel recommends that the location of the second practice target area be assessed by the Institute before Newfoundland and Labrador government approval of the site is requested.

12. The panel recommends that specific criteria be developed to evaluate the suitability of proposed camera targets and that land use be an essential element of those criteria.

13. The panel recommends that the location of camera targets be entered in the Geographic Information System so that information on them is readily available.

14. The panel recommends that DND formalize procedures with the Churchill Falls Labrador Corporation in Churchill Falls for the conduct of low-level training in that area to minimize the risk of collisions between helicopters and low-flying jets.

15. The panel recommends that DND co-ordinate closely with Transport Canada on changes to flying boundaries and procedures associated with the Allied low-level flying program.

12.3 Economic and Employment Impacts

16. The panel recommends that:

- DND continue to work with the appropriate unions, local training institutions and Human Resources Development Canada to meet its training needs.
- Employment equity programs be practised to ensure hiring of aboriginal people and women. In support of this initiative, DND should pursue such mechanisms as daycare and an apprenticeship program, as required.
- Special attention be paid to the recruiting, training and promotion of aboriginal employees.

17. The panel recommends that CFB Goose Bay work with interested business representatives from the various regional groups of the Quebec-Labrador peninsula to clarify Base procurement needs and identify prospective regional suppliers. In particular, the panel encourages DND to explore opportunities for increasing local/regional benefits for aboriginal groups.

18. The panel recommends that the avoidance criteria for future non-consumptive adventure tourism within the low-level training area be reviewed on a case-by-case basis as the industry develops and that alternatives be considered for the avoidance of such activities as necessity requires.

12.4 Social Impacts

19. The panel recommends that DND continue to work closely with the Town of Happy Valley-Goose Bay, the Newfoundland and Labrador Housing Corporation (NLHC) and the Melville Native Housing Association (MNHA) in monitoring housing demand.

20. The panel recommends that DND ensure that timely information is received by those affected regarding its plans to displace civilians from Base housing.

21. The panel recommends that DND conduct cross-cultural awareness training for all incoming Canadian Forces, DND civilian employees and Allied Forces.

22. The panel recommends that the Institute undertake studies to determine the extent of resource harvesting activity on the land and the impact that low-level flying may have on aboriginal and non-aboriginal resource harvesting.

23. The panel recommends that decisions and mitigative measures on proposed parks or reserves be formalized in the future, so as to ensure the protection of the natural environment and human activity within the parks and reserves.

12.5 Health Impacts

24. The panel recommends that DND advise regulatory agencies of the map co-ordinates of all future fuel dumping incidents.

25. The panel recommends that the study of hydrocarbon concentrations in fuel dumping areas include the behaviour of petroleum hydrocarbons in aquatic systems.

26. The panel recommends that DND investigate methods (e.g. runway usage, takeoff times) to mitigate Project-related noise that affects Spruce Park schools.

27. The panel recommends that a continuing program of monitoring and study be carried out to ensure that noise effects do not remain undiscovered and unmitigated. Particular attention should be paid to monitoring the impacts of noise on the school environment. The panel also recommends that the non-auditory impacts of noise, such as those on blood pressure, pregnancy and annoyance, be included in monitoring studies by the proposed Institute.

28. The panel recommends that DND explore other methods of noise reduction for Spruce Park before considering any extensions of the berm.

12.6 Natural Environment issues

29. The panel recommends that a survey be carried out to locate Osprey and Bald Eagle nest sites in the area covered by Option “B.”

30. The panel recommends that a study to determine the behavioural and population responses of Ospreys and Bald Eagles to overflights be an effects monitoring priority.

31. The panel recommends that the important breeding, moulting and staging concentrations of waterfowl in the unsurveyed areas covered by Option "B" be given priority.

32. The panel recommends that the Institute consider whether or not the identification of potential nesting habitat for Harlequin Ducks needs to be undertaken and if it can be accomplished as an add-on to other field studies (e.g. river valley study).

33. The panel recommends that, depending on the information generated by baseline studies in the new flight training configuration and armed with knowledge of how many of the 1400 proposed night sorties are low level, the Institute determine if the impact of night sorties needs to be monitored.

34. The panel recommends that priority be given to studies aimed at describing river valley resources and monitoring programs to evaluate impacts of the Project on wildlife resources in them.

35. The panel recommends that DND adopt the commitment to fly only across the Churchill River valley and the Trans Labrador highway. If operationally viable, this avoidance measure should be considered for other high-use valleys.

36. The panel recommends that a study be undertaken to determine the locations of winter concentrations of moose in the Option "B" configuration before releasing it for flight training.

37. The panel recommends that, in view of the increased number of sorties. food chain monitoring studies be carried out.

12.7 Caribou

38. The panel recommends a continuation of the Red Wine caribou calf survival study.

39. As a precautionary measure, the panel recommends that the seasonal distribution of the Lac Joseph herd be established prior to the commencement of flying in the reconfigured training area to determine if adjustments should be made to the training area’s western boundary.

40. The panel recommends that governments ensure the establishment, at the earliest possible date, of a joint Canada/Quebec/Labrador caribou management board for the George River caribou herd that would have underlying principles, objectives, responsibilities and membership as outlined in this report. Lessons learned in the management of the Beverley-Kamanuriak and Porcupine herds in northern Canada should be considered in the development and operation of the Board.

12.8 Mitigation and Avoidance

41. The panel recommends that the Institute examine the success of the “in-town” mitigative measures proposed in the EIS and suggest modifications to these measures as required in the future.

42. Until adequate baseline studies have been completed in the new areas to be overflown, the panel recommends that flying continue to be conducted in the present low-level training areas with no reduction at this time in current avoidance criteria.

43. The panel recommends that, through the Institute, a monitoring program address the potential impacts of

low-level flying, other than Project-related low-level jet flying, on sensitive wildlife.

44. As it is not operationally feasible to avoid the entire calving area of the Red Wine caribou herd, the panel recommends that during the last week of May and the first three weeks of June, corridors of permitted training activity be designated in the calving area of the Red Wine herd to minimize the number of females being overflown.

45. The panel recommends that the Institute examine DND's proposals with respect to increasing avoidance of main camps and implementing block closures

46. The panel recommends that avoidance of moose hunters during the fall hunt be examined in the review of the avoidance criteria to be conducted by the Institute.

47. The panel recommends that the proposed 10-NM military flying exclusion zone around Churchill Falls be implemented upon the reconfiguration of the low-level training area. The size of the zone should be examined periodically by the Institute and adjustments made as required.

48. The panel recommends that information be regularly transmitted to the public on the work being done by the Institute, the changes to the avoidance program and results of research and compliance auditing.

12.9 Monitoring and Research

49. The panel recommends that compliance monitoring be conducted by the Institute for all activities associated with low-level flight training in Quebec and Labrador.

50. The panel recommends that the Geographic Information System continue to be used to support the compliance monitoring of low-level training activities and that other uses continue to be investigated.

51. The panel recommends that avoidance and effects monitoring programs be integrated for the sake of cost effectiveness and efficient project management.

52. The panel recommends that, in an attempt to ensure the best protection to the environment, all parties (aboriginal, non-aboriginal, federal, provincial, DND) be involved as equals in the decision-making and review process for the overall monitoring program.

53. The panel recommends that all parties be involved in the setting of objectives for the future monitoring program and the evaluation of acceptable levels of impact.

54. The panel recommends that research and monitoring studies relating to control and experimental situations in the Option "B" configuration be given a high priority by the Institute. Any research carried out must have practical application and not be just "pure" research; the findings are to support an adaptive management approach for the Project.

55. The panel recommends that the funding DND has committed to the future overall monitoring program, $1.5 million per year for the life of the new MMOU, be indexed to inflation.

12.10 The Institute

56. The panel recommends that the federal government appoint an external consultant to initiate the establishment of the Institute, up to the point where the Board of Directors has been selected. The Institute's Board of Directors should include representatives of the organizations and groups listed in this report and represent the interests of all resource users, of governments and of the academic community. In order to ensure integration of efforts, some of the Institute's Directors would also hold similar appointments on the proposed George River Caribou Herd Management Board.

57. The panel recommends that:

- DND's commitment of $1.5 million be directed towards the establishment and operation of the Institute.
- Funds at least equal to the Allied contribution to DND funds be provided by other federal and provincial agencies.

58. The panel recommends that the Resource User Advisory Group be collapsed in light of the role to be played by the Institute. The panel also recommends that resources allocated for the Resource User Advisory Group be put towards the implementation and,operation of the Institute.

ENVIRONMENTAL ASSESSMENT PANEL REVIEWING
MILITARY FLYING ACTIVITIES IN
LABRADOR AND QUEBEC

Alexander Davidson
Chairman

Linda Andersen

W.D. Stewart

Colin Bird

Robert Connelly

Tom Northcott

Gordie **Rendell**

APPENDIX A

PANEL MEMBERSHIP

Current Panel Members

Alexander Davidson (Panel Chairman)

Mr. Davidson, who resides in Nepean, Ontario, is a former Assistant Deputy Minister with Parks Canada and past President of the Royal Canadian Geographical Society. He also held ADM positions with Environment Canada (Policy, Planning and Research) and Energy, Mines and Resources Canada (Water). He replaced Dr. Barnes as panel chairman in June 1993.

Linda Andersen

Ms. Andersen, a resident of Happy Valley-Goose Bay, Labrador, has been Executive Director of Labrador Legal Services since 1986. She is knowledgeable about native groups and associations in the region, their way of life and their concerns. Mrs. Andersen has served on the panel since October 1991.

Colin Bird

Mr. Bird is an environmental consultant based in Montreal. Over the past nine years, he has worked with several groups in northern Quebec on environmental assessment of projects, including the Great Whale hydroelectric project and the Forward Operating Location in Kuujjuaq. Mr. Bird has served on the panel since his appointment in October 1993.

Robert Connelly

Since his retirement from the federal government in 1985, Mr. Connelly, who lives in Ottawa, has done consultant work with Indian groups across the country and also with the federal government in a variety of areas: land claims, policing, self-government. etc. Mr. Connelly has served on the panel since June 1993.

Tom H. Northcott

Mr. Northcott is a biologist who has extensive experience in Newfoundland and Labrador. He is Vice-President of Northland Associates Ltd., a St. John's-based environmental consulting firm. Previously, he was a research biologist with the wildlife division of the Government of Newfoundland. Mr. Northcott has been on the panel since it was formed in 1986.

Gordie Rendell

Mr. Rendell, a native of Labrador, is a former television and radio broadcaster with the Canadian Broadcasting Corporation in Happy Valley-Goose Bay. He has worked and travelled extensively throughout Labrador and is familiar with and well-known in the local communities. Mr. Rendell has served on the panel since October 1991.

W.D. Stewart

Mr. Stewart retired from the Canadian Forces in 1984 with the rank of Brigadier General. He served as the Commander of the Canadian Forces Unit at Goose Bay from 1972 to 1974. His last assignment was as the Deputy Commander 24th NORAD Region in Syracuse, New York, with responsibility for the training and employment of Canadian and U.S. air defence forces in the northeastern United States and sections of eastern Canada. Mr. Stewart resides in Almonte, Ontario and has been with the panel since 1986.

Former Panel Chairperson

Dr. David Barnes (July 1986 to June 1993)

Former Panel Members

Mr. William Jourdain (July 1986 to March 1987)
Mr. Jacques Kurtness (March 1987 to June 1993)
Ms. Diane Martin (January 1987 to October 1991)
Mr. Tim McNeill (July 1986 to October 1991)
Mrs. Beatrice Watts (July 1986 to December 1986)
Dr. Paul Wilkinson (July 1986 to July 1991)

APPENDIX B

LIST OF TECHNICAL EXPERTS

Technical Experts for Review of EIS Submitted in October 1989

Name	Area of Expertise
Dr. D. Bird	Impacts on migratory birds
M. S. Bouchard	Socio-economic impacts — Quebec area
Mr. D. Cressman	Water pollution
Dr. G. Daigle	Physical aspects of noise
Dr. J.G. Fodor	Public health
Dr. V. Geist	Noise impacts on wildlife
Dr. G. Graham	Land claims relationships to native development
Dr. D. Haglund	Military policy
Dr. B. Heidenreich	Socio-economic impacts — Labrador area
Mr. I. Juniper	impacts on caribou
Mr. G. Lee	Socio-economic impacts — Labrador area
Dr. M. Mackey	Nutrition
Dr. W. Montevecchi	Impacts on migratory birds
Dr. D. Morris	Impacts on small mammals
Dr. N.S. Novakowski	Impacts on small mammals
Ms. C. Pelletier	Socio-economic impacts — Quebec area
Ms. S. Popovitch-Penny	Socio-economic impacts — Happy Valley-Goose Bay area
Dr. P. Renouf	Archaeology
Dr. J. Sokolsky	hlilitary policy
Dr. V. Solman	Impacts on birds — bird/aircraft collision
Dr. J. Tuck	Archaeology
Ms. S. Vincent, Centre de recherche et d'analyse en science humaines	Socio-economic impacts — Quebec area

Technical Experts for Review of EIS Submitted in April 1994

Name	Area of Expertise
Ms. C. Brice-Bennett	Socio-economic impacts — Labrador
Ms. S. Vincent, Centre de recherche et d'analyse en science humaines	Socio-economic impacts — Quebec
Dr. P. Duinker	Mitigation/avoidance program
Dr. R. Hétu	Irnpacts of noise on humans
Mr. I. Juniper	Irnpacts on caribou
Dr. W. Montevecchi	Irnpacts on birds
Dr. N.S. Novakowski	Irnpacts on small mammals

APPENDIX C

TERMS OF REFERENCE AND CLARIFICATION OF THE TERMS OF REFERENCE

TERMS OF REFERENCE FOR THE REVIEW OF MILITARY FLYING OPERATIONS BASED AT GOOSE BAY, LABRADOR

Mandate of the Environmental Assessment Panel

The Environmental Assessment Panel established by the Minister of Environment is to undertake a review of the environmental and socio-economic issues associated with low level flight training in Labrador and in the Northern and lower north shore parts of Quebec.

Scope of the Review

The review will examine:

1) the existing and anticipated low level flight training being carried out in accordance with bilateral agreements with NATO allies; and

2) a proposal to establish an integrated Tactical Fighter Weapons Training Centre (TFWTC) for training NATO Air Forces. The proposed TFWTC would require airport and infrastructure expansion, as well as training facilities at Goose Bay and the development of tactical weapons ranges in Labrador.

The Panel will consider the impacts of current, planned and proposed military flight training activities on the quality of the environment and on its natural resources, particularly on wildlife, such as the caribou, which are important to native livelihood. A joint study has been commissioned by the Federal and Newfoundland governments on the effects of current flying activities on caribou. The Panel will also review the public health effects of low flying aircraft on the affected populations in the region. A study on the subject has been initiated by the Canadian Public Health Association under the sponsorship of the Newfoundland Government. Data examined will include both of these studies, although they should not be considered as the total information base for the review of these questions.

The Panel will review the socto-economic effects of the proposal on communities and people in the Goose Bay area and on the Labrador coast as well as on permanent and temporary settlements, including traditional hunting, fishing and trapping camps as well as outfitting campsites within flight corridors and target practice areas. The effects to be reviewed include impacts on employment and economic development, on community facilities and infrastructures, and on native social organization, lifestyles, land use and wildlife harvesting.

Issues related to land use by the native people are within the scope of the review. However issues related to land claims policy are not within the scope of the review and neither is Canada's defence policy.

There are other activities planned in the region (i.e. the new North Warning Radar System in Labrador and the concurrent development of Gull Island and/or Muskrat Falls hydroelectric projects with a potential sawmill operation) which will not be reviewed by this Panel. However information on planned activities would be provided to the Panel so it may understand the cumulative impacts if any, resulting from the activities it will review and other activities planned in the region.

In addition to being reviewed under the Environmental Assessment and Review Process, the project is also subject to the federal impact assessment process of the James Bay and Northern Quebec Agreement (JBNQA). The Panel will therefore give due consideration to the guiding principles stated in section 23.2.2 and 23.2.4 of the JBNQA in its review. These principles are appended to this document.

Project Description

The existing low level flight training planned for the summer of 1986 involves the use of the Goose Bay airfield, flying areas, buildings, facilities, infrastructure and equipment. Flying areas would consist of 100,000 km^2 of airspace identified in the project description. Between 60 and 75 aircraft making up to 150 sorties daily are at Goose Bay during training periods. Areas in Labrador and Quebec, suitable for low level flying training down to 100 feet above ground are used by the aircraft. Practice target areas in Labrador, would also be used by the aircraft.

The Tactical Fighter Weapons Training Centre would be established in the early 1990's. The combination of the existing and planned increase of low flying activities as well as the establishment of a TFWTC would result in modernization of existing facilities as well as significant expansion and new construction at Goose Bay. Practice target areas would also be used for the full range of conventional weapons, including high explosives.

The existing and expanded training and the TFWTC activities would involve a total of approximately 300 aircraft movements daily at Goose Bay airport. A multinational staff of 1700 would provide base support as well as 500 aircrew and 1500 groundcrew deployed on a temporary duty basis.

Review Process

The review process will include the following:

1. formation of an Environmental Assessment Panel;

2. a scoping exercise to identify the priority issues and concerns to be addressed in the review followed by the issuance of draft guidelines for the preparation of an Environmental Impact Statement (EIS). The guidelines will be finalized following discussion at public meetings and issued to the Proponent for preparation of the EIS;

3. distribution of the EIS by the Panel to the public and government agencies for review and comment;

4. if necessary, following the review of the EIS, a request by the Panel to the Proponent for more information;

5. public meetings to be held by the Panel to hear views and comments on the low level flight activity and the TFWTC proposal and their environmental and socio-economic effects.

Reporting

The Panel will submit a report to the Minister of Environment and to the Minister of National Defence. The report will recommend measures to minimize adverse impacts of existing low level flight training being conducted in accordance with a bilateral agreement with NATO allies and will indicate whether the proposed TFWTC should proceed or not and if so under what conditions. All efforts will be made to ensure that the review process and the submission of the Panel's report are completed within a reasonable amount of time to allow a prompt response by Canada to any invitation to host a TFWTC. (Currently, it appears that such a decision will have to be made early in 1988).

(Appendix to the Terms of Reference)

JAMES BAY AND NORTHERN QUEBEC AGREEMENT

GUIDING PRINCIPLES OF THE ENVIRONMENTAL AND SOCIAL PROTECTION REGIME

23.2.2 The said regime provides for:

a) A procedure whereby environmental and social laws and regulations and land use regulations may from time to time be adopted if necessary to minimize the negative impact of development in or affecting the Region upon the Native people and the wildlife resources of the Region;

b) An environmental and social impact assessment and review procedure established to minimize the negative environmental and social impact of development on the Native people and the wildlife resources of the Region;

c) A special status and rnvolvement for the Native people and the other inhabitants of the Region over and above that provided for in procedures involving the general public through consultation or representative mechanisms wherever such is necessary to protect or give effect to the rights and guarantees in favour of the Native people established by and in accordance with the Agreement.

d) The protection of the rights and guarantees of the Native people established by and in accordance with Section 24:

e) The protection of the Native people, their economies and the wildlife resources upon which they depend:

f) The right to develop in the Region.

23.2.4 The concerned responsible governments and the agencies created in virtue of this Section shall within the limits of their respective jurisdictions or functions, as the case may be, give due consideration to the following guiding principles:

a) The protection of Native people, societies, communities and economies, with respect to developmental activity affecting the Region;

b) The environmental and social protection regime with respect to minimizing the impacts on the Native people by developmental activity affecting the region;

c) The protection of the hunting, fishing and trapping rights of Native people in the Region and their other rights therein with respect to developmental activity affecting the Region;

d) The protection of wildlife resources, physical and biotic environment, and ecological systems in the Region with respect to developmental activity affecting the Region:

e) The involvement of the Native people and other inhabitants of the Region in the application of this regime;

f) The rights and interests of non-Native people, whatever they may be;

g) The right to develop, in accordance with the provisions of the Agreement, by persons acting lawfully in the Region;

h) The minimizing of negative environmental and social impacts of development on Native people and non-Native people and on Native and non-Native communities by reasonable means with special reference to those measures proposed. recommended or determined by the impact assessment and review procedures.

Ministre de l'Environnement

CANADA

Minister of the Environment

MAR 2 1 1988

Dr. David H. Barnes,
Chairman,
Environmental Assessment Panel
Reviewing Military Flying Activities
in Labrador and Quebec,
13th Floor, Fontaine Building,
200 Sacré-Coeur Boulevard,
Hull, Canada.
K1A OH3

Dear Dr. Barnes,

I understand that it would be helpful were I to offer some additional comments pursuant to my letter to you of 20 July concerning your panel's mandate.

As you recall, the central issue addressed in my earlier letter was the possibility that the Panel might recommend the cessation of existing low-level training flights if it concluded that the effects of such activities were serious and could not otherwise be mitigated. At that time, I stated that, because of commitments to its allies, the Government of Canada could not accept such a recommendation at present. The Minister of National Defence, too, has made the same point on a number of occasions. For this reason, I indicated that the Panel should limit its recommendations to measures aimed at mitigating the problem but not stopping the flights It follows that those participating in the-review ougnt not to think that the work of the Panel could reasonably result in such a termination.

Nevertheless, I consider the independence of a panel to be a key component of the Environmental Assessment and Review Process, and nothing I have said should be construed as restricting its obligation to follow its collective conscience. Stated more bluntly, what you write in your report is for you to decide. I hope, however, that the limitations I have described will be taken fully into account when the Panel decides on the wording of Its recommendations.

I trust that this further clarification will assist you in completing the review.

All best wishes,

Yours sincerely, ,

Tom McMillan, P.C., M.P.
Hillsborough

APPENDIX D

LIST OF PARTICIPANTS AT THE PUBLIC HEARINGS

SEPTEMBER 19, 1994
HAPPY VALLEY-GOOSE BAY, LABRADOR

AFTERNOON SESSION

No formal presentations.

EVENING SESSION

Member of Parliament for Labrador
Hon. Bill Rompkey

Government of Newfoundland and Labrador
Hon. Edward Roberts

Town of Happy Valley-Goose Bay
Mayor Harry Baikie, Larry Pittman

Labrador Inuit Association
Joe Dicker, Judy Rowell

Sterling Furlotte
Elizabeth Broomfield

Terpstra & Associates
Jelle Terpstra

George Waye
John Hickey
Peter Woodward

SEPTEMBER 20, 1994
HAPPY VALLEY-GOOSE BAY, LABRADOR

AFTERNOON SESSION

Susan Felsberg

Cable Labrador Limited
David Hunt

Randy Ford
Bernie Broomfield
Larry Pardy
George Waye
Peter Woodward
Mike Brodnicki

EVENING SESSION

Warrick Pye
Janna Cuk
Dean M. Clarke
Chris Lethbridge
Larry Bradley
Mike Brodnicki
Susan Felsberg
Ron Bowles

SEPTEMBER 21, 1994
NORTH WEST RIVER, LABRADOR

Session rescheduled.

SEPTEMBER 22, 1994
LABRADOR CITY, LABRADOR

EVENING SESSION

Towns of Labrador City and Wabush
William Kelly (Wabush Mayor), Karen Schellinck, Graham Letto

Concerned Citizens Group — Labrador West
Ern Condon, Carole Dunphy, Kumud Acharya

UCTE Local 90940
Shane Parrott

Labrador West Chamber of Commerce
Gord Parsons, Rehan Malik

Labrador West Regional Development Association
Al Thorns, Joyce Montague, Joe Roberts

Steve Michelin

MHA Menihek District
Alec Snow

Stella Saunders

Steel Workers of America, Local 5795
George Kean, Randy Collins

Hank Shouse

SEPTEMBER 23, 1994
SCHEFFERVILLE, QUEBEC

AFTERNOON SESSION

Evelyne St. Onge
Marie-Jeanne Andre

Naskapi Band of Quebec
John Mameamskum

EVENING SESSION

Session cancelled.

SEPTEMBER 26, 1994
SEPT-ÎLES, QUEBEC

AFTERNOON SESSION

Counsel of Innu Takuaika, Uashat Mani-Utenam
Konrad Sioui, Jules Michel Ambroise, Leo St-Onge, Bernard St-Onge

Sept-Îles Airport (Transport Canada)
Michel Lafrance

EVENING SESSION

Centre de recherche et d'analyse en sciences humaines
Sylvie Vincent

Town of Sept-Îles
Jean-Marc Dionne

SEPTEMBER 27, 1994
NATASHQUAN, QUEBEC

AFTERNOON SESSION

No presentations.

EVENING SESSION

Town of Natashquan
Mayor Rosaire Landry

Claude Landry

SEPTEMBER 28, 1994
LA ROMAINE, QUEBEC

AFTERNOON SESSION

Municipality of La Romaine
Ghislain Collard

EVENING SESSION

No presentations.

SEPTEMBER 29, 1994
ST. AUGUSTIN, QUEBEC

AFTERNOON SESSION

No presentations

OCTOBER 3, 1994
NAIN, LABRADOR

EVENING SESSION

John Igloliorte
Rosina Howell
Lisa Lamb

OCTOBER 4, 1994
NAIN, LABRADOR

AFTERNOON SESSION

Labrador Inuit Association
Toby Andersen, Joe Dicker

EVENING SESSION

Ronald Webb
Mary Webb
Beatrice Watts

OCTOBER 5, 1994
NORTH WEST RIVER, LABRADOR

EVENING SESSION

Town of North West River
Deputy Mayor Audrey McLean, Joan McLean

Maharla White
Leander Baikie
Ernie McLean
Winnie Montague
Tim Roberts
Tanya Pottle
Art Williams

Innu Nation
Peter Penashue, Ben Michel

OCTOBER 6, 1994
HOPEDALE, LABRADOR

EVENING SESSION

Greg Flowers
Norman Broomfield
Frank Sillett

Ned Shiwak
Reverend Ray Hunter
Beatrice Dicker
Martha Winters-Abel
Boas Kairtok

OCTOBER 7, 1994
MAKKOVIK, LABRADOR

AFTERNOON SESSION

Combined Councils of Labrador
Neil Andersen

Makkovik Community Council
Joan Andersen

Torngamiut Inuit Annait
Ruth Flowers

Rupert McNeil
Mayor Barry Andersen
Samuel Jacque
Enid McNeil

OCTOBER 17, 1994
KUUJJUAQ, QUEBEC

EVENING SESSION

Makivik Corporation, Town of Kuujjuaq, and Kativik Regional Government
Willie Adams, Robert Lanari

Jobie Peters

OCTOBER 18, 1994
KUUJJUAQ, QUEBEC

AFTERNOON SESSION

Jaanimmarik School of Kuujjuaq
Bridget Saunders, Jessie Annanack, Jeannie Dupuis. Jimmy Whiteley, Joseph Snowball, Maggie Annanack

Robert Lanari
Harvey Mesher

EVENING SESSION

Residents of Kangiqsualujjuaq
Maggie Emudluk, Bobby Baron, Ken Jararuse, Norman Snowball, Johnny George Annanack, Edward Snowball, Kenny Angnatuk, Lucas Etok, Paul Jararuse, Kitty Annanack, Louisa Whiteley, Susie Emudluk, Maggie Annanack, Annie Annanack

OCTOBER 19, 1994
CHURCHILL FALLS, LABRADOR

EVENING SESSION

Kenneth Dalley
Monty Rowe
Vince Alley
Lew Allingham
Bernard Mackey
Victor Penney

Churchill Falls (Labrador) Corporation
Jim Haynes

Francis Clarke

International Brotherhood of Electrical Workers, Local Union 2351
Steve Ryan

Noreen Heig hton
Ron Bowles
Cindy Mackey

OCTOBER 20, 1994
CARTWRIGHT, LABRADOR

AFTERNOON SESSION

Henry Gordon Academy
Norman Morris, Janet Paul, Michele Martin

Cartwright Community Council
Max Mullins

Woody Lethbridge
Jim Pardy
John Martin

OCTOBER 21, 1994
SHESHATSHIT, LABRADOR

Session cancelled.

OCTOBER 22, 1994
SHESHATSHIT, LABRADOR

Session cancelled.

OCTOBER 24, 1994
HAPPY VALLEY-GOOSE BAY, LABRADOR

AFTERNOON SESSION

George Waye
Right Reverend D.F. Harvey

Department of Social Services, Government of Newfoundland and Labrador
Brendan Mullaly

Department of Health, Government of Newfoundland and Labrador
Joan Dawe, Faith Stratton, Beverly Clarke

Canadian Public Health Association
David Beach, Roy West

Atlantic Canada Opportunities Agency
Gordon Slade, Keith MacDonald, Sterling Peyton

Susan Felsberg
Bernie Bolger
Mike Brodnicki
Larry Pittman

EVENING SESSION

William Montevecchi
N.S. Novakowski

Environment Canada
Myrtle Bateman, Alan Mclver

Susan Felsberg

OCTOBER 25, 1994
HAPPY VALLEY-GOOSE BAY, LABRADOR

AFTERNOON SESSION

Labrador Métis Association
Richard Learning, Bob Mesher

Decima Research
Peter Butler, Mayor Harry Baikie

Transport Canada
Bill Boucher

St. John's Board of Trade
Nancy Healy

Bernice Lethbridge-Heard

EVENING SESSION

Raymond Hetu

Health Canada
Steven Bly, Tom Humes

James Baxter
Robin Hill
Mike Brodnicki
Alan Mclver
Michael Hanrahan
Patrick Dutton
Bernie Broomfield
Larry Pittman
Susan Felsberg
Chris Lethbridge
Ron Bowles

OCTOBER 26, 1994
HAPPY VALLEY–GOOSE BAY, LABRADOR

AFTERNOON SESSION

Carol Brice-Bennett

Town of Happy Valley-Goose Bay
Mayor Harry Baikie, Carl Sheppard

Labrador Inuit Association
Mary Adams, Curtis Saunders, Fred Hall, Toby Andersen, Judy Rowell

Labrador North Chamber of Commerce
Peter Woodward, Patrick Dutton

Enterprise Newfoundland and Labrador, Government of Newfoundland and Labrador
Harold Marshall, Kevin Hynes

Kirby Lethbridge

EVENING SESSION

Department of Indian Affairs and Northern Development
Gordon Shanks, Don McDonald

Government of Newfoundland and Labrador
Ray Hawco

Labrador North Chamber of Commerce
Peter Woodward, Patrick Dutton

Mike Kennedy
Jim Wiseman
John C. Lorimer
Kirby Lethbridge
Toby Andersen
Ian Strachan
Larry Pittman
Susan Felsberg

OCTOBER 27, 1994
HAPPY VALLEY-GOOSE BAY, LABRADOR

AFTERNOON SESSION

Ian Juniper

Wildlife Division, Government of Newfoundland and Labrador
Ken Curnew, Gene Mercer

Labrador Inuit Association
Paulus Maggo, Boas Jararuse, Gustav Boase, Gus Dicker, Toby Andersen, Albert Peter

William Barbour
Chris Lethbridge
Susan Felsberg
Judy Rowell

EVENING SESSION

Tom Bergerud
Fred Harrington
Peter Duinker
Ian Juniper
Albert Peter
Michael Hanrahan
Judy Rowell

OCTOBER 28, 1994
HAPPY VALLEY-GOOSE BAY, LABRADOR

MORNING SESSION

Labrador Inuit Association
Toby Andersen, Judy Rowell

Wildlife Division, Government of Newfoundland and Labrador
Ken Curnew, Gene Mercer

Department of Fisheries and Oceans
Marvin Barnes

AFTERNOON SESSION

Town of Happy Valley-Goose Bay
Larry Pittman

Union of National Defence Employees
Bernie Bolger, Tom Mason, Ivan Hector

Dottie Kelland
Patricia Kemuksigak

Rotary Club
Tom Paddon

Labrador Construction Limited
Barney Powers

Ian Strachan
Edgar Baggs
Gertie Penny
Kirby Lethbridge
Judy Rowell
Susan Felsberg
David Lemon
Michael Hanrahan

OCTOBER 29, 1994
HAPPY VALLEY-GOOSE BAY, LABRADOR

MORNING SESSION

Labrador Inuit Association
Toby Andersen

Doris Saunders

Melville Native Housing Association
Silas Bird

Colin Curleigh

Household Movers and Shippers Ltd.
Tom Hibbs, Boyce Bessey

Bernie Bolger

AFTERNOON SESSION

Woodward's Group of Companies
Peter Woodward

Ronald Sparkes
Patrick Dutton
Jim Shouse
Ron Bowles
David Lemon
Ian Strachan
Mike Brodnicki

APPENDIX E

LIST OF ABBREVIATIONS

ACOA	Atlantic Canada Opportunities Agency
ADM	Assistant Deputy Minister
AGL	above ground level
CAM	Conseil des Atikamekw et des Montagnais
CFB	Canadian Forces Base
CN	Canadian National
dB	decibel
dBA	"A-weighted" decibel scale
DND	Department of National Defence
EARP	Environmental Assessment and Review Process
EIA	environmental impact assessment
EIS	environmental impact statement
GIS	Geographic Information System
kg	kilogram
km	kilometre
L_{eq}	equivalent sound level, the level of continuous steady noise that would occur over a given time period
L_{max}	maximum sound level, the point at which the noise reaches its maximum intensity
LIA	Labrador Inuit Association
LLTA	low-level training area
LLTA-1	low-level training area 1, the northern training area
LLTA-2	low-level training area 2, the southern training area
m	metre
MMOU	Multinational Memorandum of Understanding
MNHA	Melville Native Housing Association
MOU	Memorandum of Understanding
NATO	North Atlantic Treaty Organization
NEF	Noise Exposure Forecast, the summation of all noise that takes place in a 24-hour period based on the effective perceived noise level
NLHC	Newfoundland and Labrador Housing Corporation
NM	nautical mile (one nautical mile equals 6080 feet or 1852 metres)
NORAD	North American Defense Command
PCBs	polychlorinated biphenyls
PTA	practice target area
RUAG	Resource Users Advisory Group
UN	United Nations
3 "C's"	composition, communication, consensus

APPENDIX F

ACKNOWLEDGMENTS

The panel wishes to express its thanks to all those who participated in the review of military flying activities in Labrador and Quebec, particularly members of the public who spent considerable time and effort in reviewing extensive material, preparing briefs and presenting them to the panel. The panel would also like to thank representatives of federal, provincial and local government agencies for their participation. Thanks also go to the panel's technical experts.

The panel also appreciates the work done by the Department of National Defence throughout the process.

The panel wishes to extend special thanks to its secretariat, which assisted in the review and the completion of the report:

Jim Clarke — Panel Manager
Jean Blane — Secretariat
Brian Torrie — Secretariat
Ron Fortin — Secretariat
Donna Paddon — Information Officer
Jackie Kelly — Interim Information Officer