Attitudes and Perceptions of Local Landowners Toward Military Activity and its Effects from Canadian Forces Base Shilo Military Reserve

by

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ATTITUDES AND PERCEPTIONS OF LOCAL LANDOWNERS TOWARD MILITARY ACTIVITY AND ITS EFFECTS FROM CANADIAN FORCES BASE SHILO MILITARY RESERVE

BY: Mark Daniel Wonneck

A practicum submitted to the Faculty of Graduate Studies of the University of Manitoba in partial fulfillment of the requirements of the degree of Master of Natural Resources Management.

ABSTRACT

An exploratory survey of the attitudes and perceptions of local landowners toward military activity and its effects from CFB Shilo was conducted during the summer of 1984. The survey instrument used was a self-administered mailed questionnaire. As well, locally elected officials were interviewed for their perceptions of the military presence, and comparisons were made between these perceptions and those of local landowners.

A total of 148 responses were received from the 292 landowner survey forms initially mailed out (50.1% response rate). Data were analyzed using the Statistical Package for the Social Sciences (SPSSx) computer program.

In general, respondents were not concerned about military activities and its effects from the Military Reserve and tended to consider the overall impact of the military presence to be at least somewhat positive. However, a minority of respondents were very concerned about military activities and its effects and considered the overall impact of the military presence to be negative.

Respondents owning land adjacent to the Reserve were relatively more concerned than respondents owning only non-adjacent land. Respondents residing in proximity to the Reserve were not more concerned than respondents residing more distant from the Reserve. It is hypothesized that additional factors, such as the respondents proximity to a line between the City of Brandon and the Shilo townsite and/or proximity to intensively used military training areas, have an effect on attitudes and perceptions. In addition, it is hypothesized that perceptions are influenced by a respondent's personal experience with an issue and any related media coverage.

It could not be concluded that a respondent's awareness of the leasing agreement had an influence on that individual's attitudes toward the military presence. However, it is expected that if respondents are not strongly predisposed to an unfavourable attitude, respondents who become aware of the Shilo Environmental Advisory Committee (SEAC) will tend to hold more favourable attitudes. In general, respondents did not believe there was an adequate amount of information provided to the public about military activities and it effects from the Reserve.

The majority of respondents consider the economic benefits associated with the military presence to be the greatest overall benefit related to the Reserve. Four major problem issues related to the military presence were determined: the proliferation of leafy spurge and other noxious weeds; wildlife disturbance; controlled burns (and fire hazards); and noise and vibrations from military activities. Although presently not considered a major problem, property damage by wildlife originating from the Reserve and the Spruce Woods Provincial Park is expected to become an increased concern to landowners in the vicinity of the Reserve.

Respondents seem to rely on their Local Government representatives to deal with their concerns related to the Reserve, but tend to hold the Department of National Defence responsible for military activities and its effects. Local Government officials appear to reflect the attitudes and perceptions of their constituents.

Recommendations based upon the study findings address the problem issues, the information inadequacies, and future research needs.

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Captain G. Esligar	Non-public Funds Accounting Office, C.F.B. Shilo
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Lieutenant C.W. McKinnon	Base Comptrollers Office, C.F.B. Shilo

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INTRODUCTION

1.1 PREAMBLE

The Canadian Forces Base Shilo Military Reserve is an area in southwestern Manitoba used for the training of the Canadian Armed Forces and the armed forces of other member nations in NATO (Figure 1). Other NATO nations can conduct training activities on the Reserve because of Canada's responsibility and commitment to NATO.

The Military Reserve was first used as a military training area in the years preceding World War I. Since that time local landowners have grown up with the military presence on the Reserve. In 1974, armed forces of the Federal Republic of Germany (hereinafter called West Germany) and Canada began ground training exercises on the Reserve, and CFB Shilo became subject to increased media attention (eg. Rosner 1980; and Winnipeg Free Press 1980). This occurred primarily because of the economic returns generated off the base by the influx of West German army personnel. Along with this generally positive influence, several negative aspects of military activity have been reported through the media, (i.e., fires, vegetation trampling, wildlife

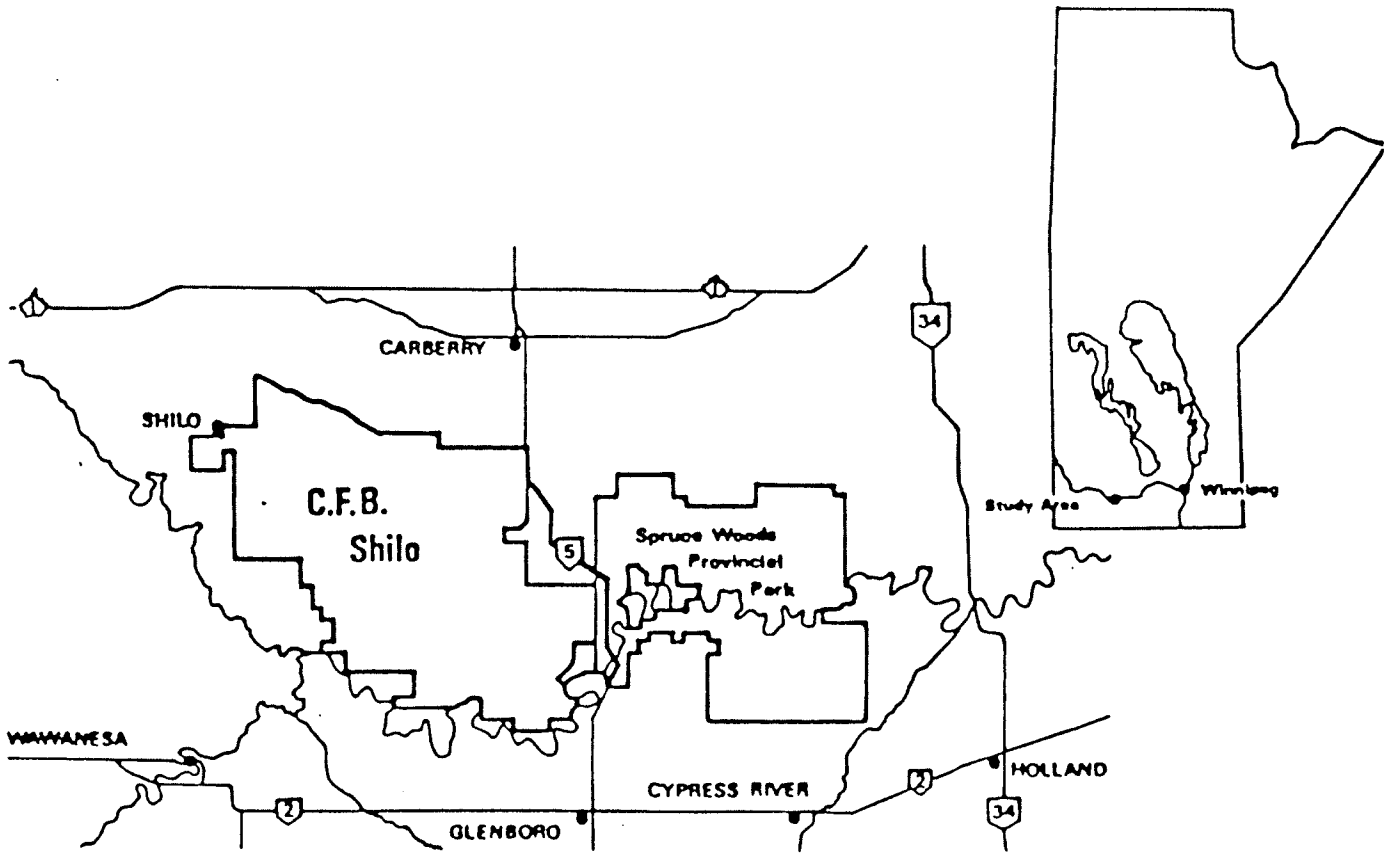

Figure 1: Location of Study Area (Taken from Strong 1981)

disturbance, noise, proliferation of agriculturally harmful weed species such as leafy spurge (Euphorbia esula), etc.). The media coverage has led to an increased awareness of the potential effects of the activities on the Reserve upon the environment and the economy, and increased confusion about the extent of these effects.

Within a new leasing agreement (Order-in-Council 499/83) signed between the Department of National Defence (DND) and the Manitoba Department of Natural Resources (MDNR) specific reference to some of the environmental effects of the military activity are made. The agreement itself can be used as a guideline by both parties involved, but in order for it to be effective, an understanding of the environmental aspects of military activity is required.

1.2 PROBLEM STATEMENT

Military operations at CFB Shilo may have impacts on regional landowners, especially those adjacent to the Reserve. The extent of these impacts has not been fully addressed primarily because of insufficient collection of scientific information and a lack of understanding of the importance of the impacts to persons affected by the military presence. To a large extent, attitudes and perceptions of local landowners can be used to gauge the effects of the military's influence in the area. The attitudes and perceptions of local landowners should be considered an important element in

decisions concerning the future use and development of the Military Reserve.

1.3 OBJECTIVES

This study is exploratory in nature and as such should be viewed as one of the first steps in addressing the issues related to the Shilo Military Reserve. The role of a study of this nature is to identify or determine relevant variables associated with the attitudes and perceptions of local landowners (Kinnear and Taylor 1979), gain insights and ideas related to issues in the area around the Reserve, establish priorities for the future study of these issues, and generate relevant hypotheses (Churchill 1976).

Although this study is exploratory, some general hypotheses were formed. They are:

1. Respondents are concerned about the military activities and its effects from the Shilo Military Reserve.
2. Concern about the military activities and its effects from the Shilo Military Reserve varies by respondent group. In particular, concern varies by:
   a) the relative awareness of landowners about the leasing agreement between DND and MDNR; and
   b) the geographic location of landowners relative to the Reserve.

3. Local landowners do not believe there is an adequate amount of information provided to the public about military activities and its effects.

In addition other relationships were examined. Specifically, differences in attitudes and perceptions were examined with respect to the demographic differences and land-use/farm characteristics of respondents. Additionally, the differences between the attitudes and perceptions of locally elected officials and those of local landowners were assessed.

1.4 DELIMITATIONS AND ASSUMPTIONS

1. The scope of the survey was limited to local landowners in the vicinity (within 16 km) of the Shilo Military Reserve.
2. For the purposes of this study, the Mayors of Carberry, Glenboro, and Wawanesa represented the views of their respective constituents with respect to military activities and its effects from the Shilo Military Reserve.
3. Unincorporated towns were not included in the sampling.
4. The City of Brandon was not surveyed in this study. Newspaper reports indicate that there appears to be a positive attitude on the part of Brandon residents toward the military presence at CFB Shilo (eg. Fitz-

Gerald, 1982). Whether or not this is the case might be addressed in future research.

Thus, this study is a survey of local landowners in a prescribed distance from the Reserve and not one which surveys all persons affected by the military presence on the Reserve.

1.5 GLOSSARY OF TERMS

adjacent landowners: landowners with property sharing or within 4.8 kilometres (3 miles) of the Reserve boundary.

impact: refers to both positive and negative effects of the military presence and activity.

local landowners: persons living within 20 kilometres from the boundary of the Reserve.

non-adjacent landowners: landowners with property between 4.8 kilometres (3 miles) and 16 kilometres (10 miles) from the boundary of the Reserve.

Reserve: Canadian Forces Base Shilo Military Reserve

1.6 SUMMARY

The purpose of this chapter has been to identify the need for research into the attitudes and perceptions of landowners in the vicinity of the Shilo Military Reserve. Research objectives are presented to provide the specific focus for the study. The scope of the study is also clearly defined in this chapter.

The following chapter (Chapter II) will provide the context for understanding local landowner attitudes and percep-

tions and indicate the role of public attitude research. Chapter III will describe the methods used to obtain the information required to address the research objectives. In Chapter IV, the research findings will be presented and discussed. Finally, conclusions and recommendations based on the research findings will form the final chapter of this study.

Chapter II

BACKGROUND

2.1 THE STUDY AREA

CFB Shilo Military Reserve is located on the Spruce Woods Forest Reserve, 160km west of Winnipeg (see Figure 1). CFB Shilo extends from the main line of the Canadian National Railway on the north to the Assiniboine River on the south, and from Provincial Road 340 on the west to Provincial Highway 5 on the east.

The Reserve borders or lies within four municipalities: The Rural Municipality (R.M.) of North Cypress, the R.M. of South Cypress, the R.M. of Cornwallis, and the R.M. of Oakland. Spruce Woods Provincial Park is situated adjacent to the eastern border of the Reserve. The predominant land-use in the vicinity of the Park and Reserve is agriculture.

There are a total of 1084 farms in the four municipalities in the vicinity of the Reserve, occupying 775 938 acres (314 145 ha)(Manitoba Department of Agriculture, Statistical Analysis Section, unpublished data). Approximately 67% of this area is classified as improved land (Manitoba Department of Agriculture, Statistical Analysis Section, unpublished data).

2.2 HISTORICAL DEVELOPMENT OF RESERVE

The arrival of the Canadian Pacific Railway in 1881 caused a two year land boom during which most of what is today southern Manitoba was sold to homesteaders and speculators (Background study to the development plan, Cypress Planning District, no date). In 1895, the Federal government classified the Reserve area as a timber reserve, and closed it to further settlement (Nilsson 1983). In 1910, the Militia Department of the Dominion of Canada, in an effort to secure lands in the west, acquired a training area, sufficient in extent to provide for artillery practice and manoeuvres, in a central location in what was then known as Military District No. 10 (The Shilo Stag 1984). This area was within the Spruce Woods Timber Reserve. The site was chosen for its suitability as a training area and the fact that it was accessible by both the Canadian Northern Railway, (which later became part of the CNR), and the CPR (Fannon 1965). The site acquired in 1910 was ten square miles (25.6km^2) in area.

The first camp was opened on June 21, 1910, and was called Sewell Camp. Sewell Camp was attended by a brigade of 154 officers and 1 315 other ranks (The Shilo Stag 1984). It was located on CPR property five miles north of the present town of Shilo (The Shilo Stag 1984). The Hudson's Bay Company owned the land north and south of the Camp, and offered to permit the actual Camp to be pitched on their property (Fannon 1965).

The Department of the Interior, however, declared that the Spruce Woods Timber Reserve had been created by Parliament for the purpose of protecting timber and assisting in reforestation, and using a portion of this reserve land for military training would involve a complete departure from that purpose (Fannon 1965). In September 1911, however, the Department of the Interior agreed to reserve certain tracts of land in the vicinity of Sewell station on the CPR mainline. It was these and other adjacent unoccupied tracts of land that the Militia continued to use (Fannon 1965).

During the First World War, as many as 30 000 troops, in total, were trained within the Camp boundary (The Shilo Stag 1984). In 1930, the Timber (renamed Forest) Reserve was transferred, by virtue of the Natural Resources Transfer Agreement of 1930 (presently contained within the Canada Act of 1982), to Provincial management (Background study to the development plan, Cypress Planning District, no date). After the First World War, the Camp was used for summer training only and, in 1931, the Camp was closed because of the Depression (Department of National Defence, no date).

In 1932, engineers conducted the first survey of the Shilo area. This led to the discovery and planning of the Camp's water supply (which is still in use at present) (The Shilo Stag 1984).

The first inhabitants of the Shilo townsite were members of a Relief Camp established by the Federal government in late 1932. In 1933, a long-term lease on the Camp Shilo lands was granted to DND. Local landowners in the area surrounding Shilo have had an opportunity to become accustomed to the military activity at its present site since 1934 (The Shilo Stag 1984). Plowman (1982) reports that prior to 1934, only a Forest Ranger and one other farmer lived in the Reserve area. The first Camp in 1934 consisted predominantly of pitched tents. By 1939, 25 buildings had been erected at Shilo (The Shilo Stag 1984).

Shilo grew rapidly during the Second World War. In 1940, Shilo began to assume its present form by becoming a training area for artillery and engineers. The Reserve was not utilized year-round until 1942. Following this war and the reorganization of the Canadian Army, Shilo became the permanent home of the Royal Regiment of the Canadian Army (Department of National Defence, no date).

The most recent major development in the Shilo area was the establishment of Spruce Woods Provincial Park in 1964. The Carberry Sand Hills area (Figure 2) represents the remnants of the Assiniboine River Delta, where it flowed into Glacial Lake Agassiz 12 000 years ago. The Assiniboine Delta region was designated by the Provincial Government of Manitoba as an area of natural and/or cultural significance, and the Park was established to protect this unique area and

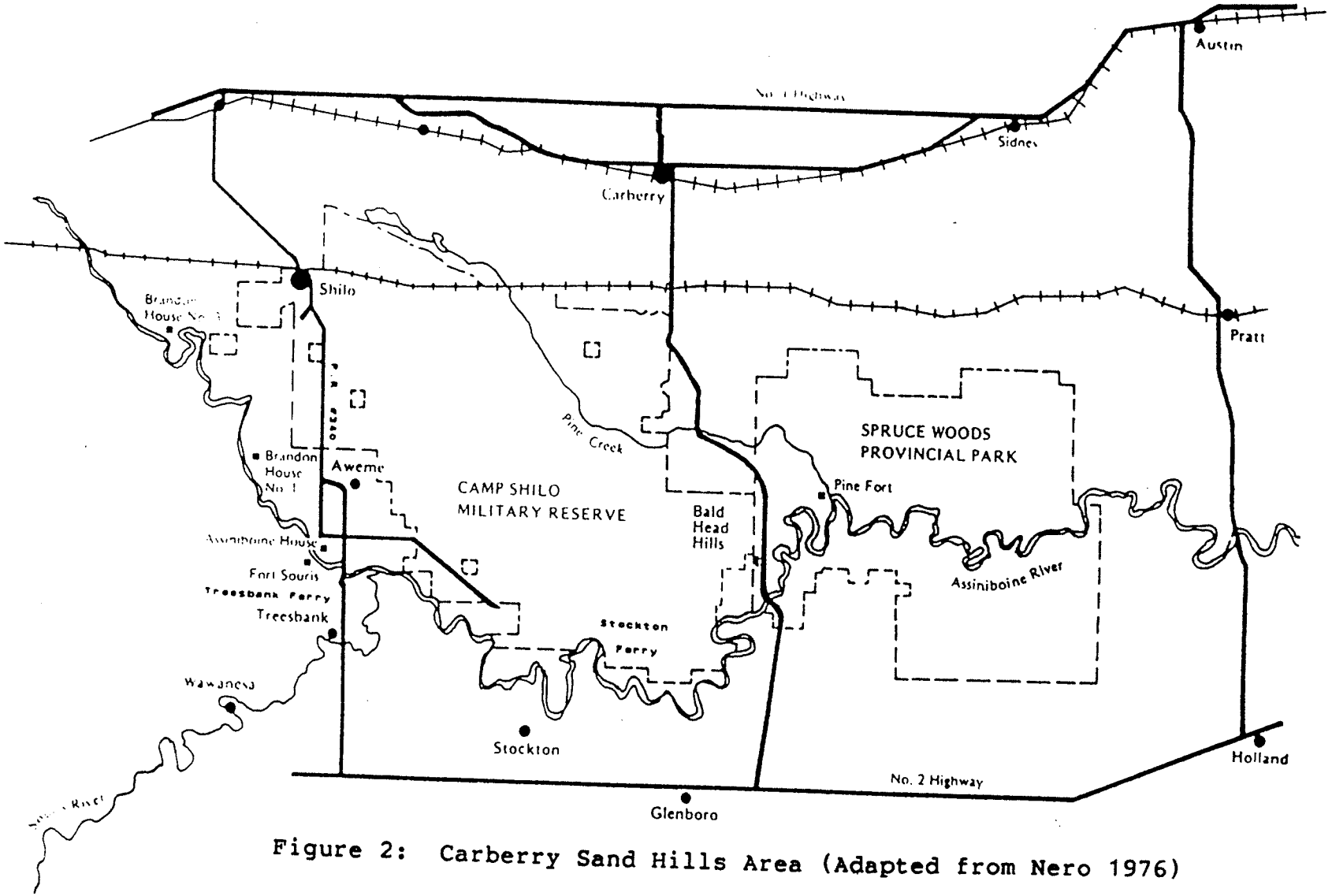

Figure 2: Carberry Sand Hills Area (Adapted from Nero 1976)

to interpret its importance (Spruce Woods Provincial Park 1982). The Bald Head Hills, a unique cultural heritage, and exotic plant and wildlife are the major attractions in the area (Spruce Woods Provincial Natural Park 1975).

During the winter of 1965/66, a West German artillery unit carried out cold weather tests on Leopard Tanks. An organization called the Manitoba Peace Council held demonstrations protesting against the presence of German troops on Canadian soil (Magnus 1965). In an effort to prevent potential public relations problems, DND transferred a public relations officer to Shilo several months before the West Germans began their tests (Cleverly 1980). However, the officer was transferred away from Shilo six months after his arrival because (according to Cleverly 1980) there was not enough for him to do.

In 1974, under agreement with Canada, West German troops began intensive ground training exercises on the Reserve. The cost of the West German training program is paid entirely by the Federal Republic of West Germany. Command and control over the Reserve remains with the Canadian Forces (Department of National Defence 1984). The influx of West German army personnel has been largely responsible for the increased media attention on CFB Shilo. The increased attention focused on the economic returns generated off the base by West German soldiers on leave in Brandon and other nearby centres.

As military activities on the Reserve increased, because of the presence of both West German and Canadian armed forces, concern for the environment in and around the Reserve developed. In response to the environmental concerns raised, MDNR and DND began funding research studies into the environmental impacts of the military presence.

In 1979, the media brought the concern for environmental damage on the Reserve to the public forum (Jager 1979). The media made use of preliminary reports on vegetation and soil studies being carried out on the Reserve. These reports were the first to suggest that vegetation trampling and soil compaction by military vehicles were having adverse effects on the environment.

The potential for conflict between those persons concerned primarily with the continued existence of the military base as a stimulant to economic growth in the area and those persons concerned primarily with the protection of the environment from military activities increased in the early 1980's. (The concern increased at this time at least partially because the ten-year leasing agreement for land contained within the Reserve between DND and MDNR expired December 31, 1983, and negotiations for a new lease had begun).

For example, the Brandon Chamber of Commerce and the Brandon Industrial Commission began to run half-page adver-

tisements starting November 23, 1982, in the Brandon Sun calling on readers to phone their member of the Legislative Assembly and ask them to support a 30-year lease for Shilo rather than just a ten-year lease. Prior to the expiration of the ten-year lease in 1983, DND requested an extension of the leasing agreement "for a total of 30 years to better facilitate military planning and programming in the area" (Order-in-Council No. 499/83). According to Schedule A of Order-in-Council No 499/83, DND requested the long-term agreement in order to implement its base development plan and major construction programme. Aggerholm and Rance (1982) reported that the Brandon Chamber of Commerce and the Brandon Industrial Commission believed the loss of upgrading funds which would occur without a long-term lease would immediately cancel prospective jobs, place the German Army Training Establishment at Shilo (GATES) in doubt, and jeopardize the future of the base. The R.M. of Cornwallis and the Brandon Chamber of Commerce were reported to have sent a letter in support of the longer term lease to the Government of Manitoba (Aggerholm and Rance 1982).

Meanwhile, suggestions had been made to the Provincial government to opt for a short-term lease. The short-term lease would ensure that an environmental impact assessment of military activities could be completed before the Province entered into a long-term commitment. The most prominent of these suggestions were made based upon a consult-

ant's report focusing on the implications of the results of ecological studies at CFB Shilo for lease renewal (MacLaren Plansearch 1983). These consultants suggested that the lease be limited to five years.

> ...A major independent analysis of the comprehensive data base and annual reports should be undertaken every fifth year from the date of its renewal, with the view to proposing changes that might be required in the terms of subsequent lease agreement (MacLaren Plansearch 1983).

They also suggested that a minimum of $60 000 be set aside each year for ecological studies (MacLaren Plansearch 1983). Rosner (1983) reported in the Winnipeg Free Press that this study found the spread of leafy spurge to be an "incredible threat" to land in proximity to the military base.

Clearly a conflict of interest was apparent prior to the signing of the current lease, although the dimension of the conflict was unclear. On one side were persons concerned with the environmental impacts of military activities, while on the other were persons concerned about maintaining the economic benefits generated by the military presence in the area. Also, the media seemed to have an influence on these concerns, but the extent of this influence is not known.

At present, the Shilo base townsite is owned by the Federal government. The Provincial government has proprietary rights over what is considered the Reserve area. The Provincial government leases this Crown land through MDNR to DND.

2.2.1 The 1983-1993 Leasing Agreement

Under the authority of Order-in-Council No. 499/83 a ten-year leasing agreement terminating December 31, 1993 was signed, with first right of renewal for a further term of 20 years provided to DND. Within the agreement contained in Schedule A of this Order-in-Council, MDNR identifies leafy spurge as a noxious weed (by virtue of The Noxious Weeds Act of 1970, s. 42) in the Shilo-Spruce Woods Provincial Park area and requires that DND, as occupant of the land, destroy all noxious weeds and weed seeds on their land as often as is necessary to prevent growth, ripening and scattering of weed or weed seeds (Clause 24). In addition, DND will be held responsible for fire prevention, detection, and suppression costs on the Crown land they have leased (Clause 14). Under this new agreement, DND and MDNR will participate in the operation of the Shilo Environmental Advisory Committee (SEAC), which is responsible for the formulation and supervision of a research program to monitor and evaluate possible environmental damage (Clause 16). DND has also agreed to fund, at $50 000.00 per year, a three-year program for the purpose of research, monitoring and evaluation of possible environmental damage (Clause 18).

Within this agreement is a commitment on the part of DND not to utilize the Crown land, under any circumstances, for testing of nuclear weapons systems. In addition, it was agreed that all road allowances within the Crown lands be

closed, except Provincial Road 340 (Clause 7). The Province reserved the right to issue timber cutting, hay and grazing, and hunting permits (Clauses 9, 11, 12).

Approximately 82 170 acres (33 267 ha) of Crown land is leased to DND at $2.00 per acre. Thus, the total rent paid is $164 340.00 per year for the first five years. The rental rate will be adjusted January 1, 1989, and the adjusted amount will not exceed a rate of increase of 2% per annum based upon the annual rent.

2.3 ENVIRONMENTAL ISSUES

This section will outline the issues related to the environment that are connected to military activity on the Reserve. It should be made clear that although military activity does affect the environment, in many instances the public perception of those effects is more pertinent than the actual impacts. The mass media can play an important role in shaping public perception about the environment (Rubin and Sachs 1973).

2.3.1 Leafy Spurge

Perhaps the most publicized environmental issue connected with the Reserve is the spread of leafy spurge. Leafy spurge, as stated earlier, had been identified as a noxious weed within the present (1983-1993) leasing agreement. The

Reserve has been considered a source from which leafy spurge is spreading to surrounding range and pasture lands (Pokrant 1982).

Although there have been a number studies into the spread of leafy spurge on the Reserve, (eg. McKernan 1981, Gorrie 1982), SEAC is still undertaking studies to determine to what extent the Military Reserve is responsible for the spread of spurge onto surrounding range and pasture lands (Minutes of SEAC Meeting, November 29, 1983).

Leafy spurge is an aggressive perennial weed which propagates by rootstalks and seeds (Best et al. 1980). The weed's deep, tough root system makes it difficult to eradicate (Best et al. 1980). In Manitoba, it is illegal to sell hay containing leafy spurge and to transport contaminated hay on public roads (Noxious Weeds Act 1970, s. 7).

MacLaren Plansearch (1983) reported that military activities and fires create bare ground, which is an ideal condition for the spread of leafy spurge. However, Kerr et al. (1978) state that training which involves the practice of concealment and camouflage leads to soil compaction and an unfavourable environment for the migration of vegetation. Best et al. (1980) noted that seed and underground parts of leafy spurge are often transported by machinery. However, Pokrant (1982) found no statistical relationship between vehicular traffic and the varied rates of leafy spurge increase for five high-use areas on the Reserve.

Leafy spurge tends to grow in homogeneous patches (Dixon 1976), and infestations are believed to spread from the forward edge of the infestation to non-infested areas. Best et al. (1980) note that although "seedlings do occur to a greater extent near the outer edge of a patch, it is never a significant method of reproduction in an undisturbed patch."

The R.M. of South Cypress and DND have jointly been involved in the application of the herbicide Tordon 22K, containing picloram (4-amino-3,5,6-trichloropicolinic acid)(C. Cullen, Weed Supervisor, Glenboro/South Cypress District, pers. comm.). According to Base Command, control in these areas has been good with only minimum regrowth in spots (Capt. D.J.R.S. Benjamin, pers. comm.). The roadsides in the northern areas of the Reserve were sprayed with Dy Cleer by a licenced chemical applicator hired by DND in 1983. According to Base Command the control was good, but regrowth was somewhat higher than in areas treated with Tordon 22K. Leafy spurge on the Reserve has experienced minor increases in some areas and decreases in others (Capt. D.J.R.S. Benjamin, pers. comm.). In 1985, additional chemical control using Tordon 22K is planned in the most intensively used training areas. West Germany provides a share of the funding for the weed control program and the various environmental studies undertaken by DND (Capt. D.J.R.S. Benjamin, pers. comm.).

Picloram is effective in controlling plants of leafy spurge and the establishment of seedlings, but ineffective against seeds within the soil (Grover and Bowes 1981). Spraying is also an expensive and rather short-term control method (Gorrie 1982).

Investigations of other methods to control leafy spurge by Agriculture Canada have concentrated on biological control. Because leafy spurge is of eastern European origin and is taxonomically complex, it is difficult and expensive to determine which insects can be used as controls. Additionally, because of the weed's origin, it is difficult to locate these insects. Biological control would require a complex of European insects and perhaps pathogens. At present, there are seven insects which may be effective in the control of spurge, but none of these are ready for widespread usage. The most promising of these is the spurge hawk moth (Hyles euphoribiae) (SEAC files, unpublished).

DND plans to assist in funding a project, organized through SEAC, which will involve the creation of an environmental data base and the monitoring of literature and control methods for leafy spurge (Minutes of SEAC Meeting, November 29, 1983). This project is planned to be conducted over three years, but at present the exact research fund allotments have not been finalized (L. Bidlake, Wildlife Biologist, MDNR, pers. comm.). In addition, DND plans to allot more than $73 000 over the next three years for the continu-

ation of vegetation and soil studies on battle-runs (Minutes of SEAC Meeting, November 29, 1983).

2.3.2 Vegetation Trampling

The two research projects listed above are a response on the part of the military not only to the question of leafy spurge infestation, but also to concerns about the effects of vegetation trampling by military vehicles and fires. Concerns about the environmental degradation from vegetation trampling were contained with an environmental report commissioned by the government and were relayed to the public through the media (MacLaren Plansearch 1983; and Winnipeg Free Press 1983a, respectively).

2.3.3 Fires

Concerns about fires on the Reserve received a great deal of media attention in 1980 (eg. Blicq 1980), spurred by a large wildfire which occurred on the Reserve that year. One article in the Winnipeg Free Press (Rosner 1980) reported that environmentalists and local residents believed that West German troops were not concerned about the ecological damages their exercises were causing. The accusation was based upon the allegation that the West German Army continued artillery fire under extremely dry conditions. In a letter to the editor of the Winnipeg Free Press published a few days after the article reporting the accusation, Lieu-

tenant-Colonel G.M. Guy (Acting Base Commander of CFB Shilo at the time) claimed that the May 22nd article had been misleading (Winnipeg Free Press 1980). The Acting Base Commander went on to write in the letter that "a conscientious effort is made by all involved to minimize the negative impact of training activities at Shilo on the environment" (Winnipeg Free Press 1980).

Range fires are not uncommon on the Reserve (Strong 1981). Many of these are the result of live ammunition firing. In most years, the areas burned are small, seldom exceeding five hectares, and widely distributed over the Reserve (Strong 1981). Major fires on the Reserve occur irregularly (Strong 1981). Kerr et al. (1978) report that there were major fires on the Reserve in 1961, 1968, 1972, 1974, and 1976. The most substantial of these was the fire in 1961, in which two thirds of the area in the eastern portion of the Reserve was burned (Kerr et al. 1978). The military maintains a system of fireguards on the Reserve, consisting of three to seven meter wide lanes of bare soil, to assist in the containment of fires.

In recent years, efforts have been made to control the spread of leafy spurge by the use of controlled burns and limited cultivation (Pokrant 1982). Controlled burns in spring are also carried out to reduce the risk of wildfires. The fires are set prior to the arrival of the first contingent of West German trainees in May. The controlled burns

are usually extensive and create large clouds of smoke which dissipate downwind of the Reserve. Because of the limited number of personnel and equipment managing a burn, the military must rely heavily on fireguards to contain the fire.

2.3.4 Wildlife Disturbance

In recent years there has been an interest in determining whether military activities disturb wildlife on the Reserve. Wildlife disturbance is difficult to define because, generally, some wildlife species benefit from certain military activities while others are harmed. SEAC requested that a study of elk (Cervus canadensis) use of the northeast portion of the Reserve be carried out prior to any development for military purposes in that area (Strong 1981). Strong (1981) concluded that the arrival of the German armed forces altered the land-use pattern on the Reserve and created habitat more suitable for elk. There have been reports in the media that suggest that the Military Reserve actually has protected a unique environment from agriculture or other habitat-destructive land uses (Winnipeg Free Press 1983b). As well, there has been a report in the Winnipeg Free Press that the military presence on the Reserve improves the habitat of sharp-tailed grouse (Tympanuchus phasianellus) (Jager 1984).

2.3.5 Depredation

The Reserve functions to an extent as a wildlife sanctuary. Strong (1981) reported that the population of elk on the Reserve has apparently increased five fold from 1969 to 1979. This has led to an increase in the number incidents of elk leaving the Reserve and entering private lands. However, based on the number of requests for compensation, depredation by elk of cropland surrounding the Reserve is not considered a serious problem (D. Pastuck, Damage Control Specialist, MDNR, pers. comm.). In the past two years (1983 to Sept. 1984), nine complaints of elk causing damage in and around the Reserve have been received by the MDNR regional office in Brandon. Three of these complaints resulted in compensation being paid to farmers (S.A. Robak, Conservation Officer, MDNR, pers.comm.). Controlling depredation and compensating landowners for depredation is the responsibility of MDNR.

On January 17, 1985, over 100 individuals met in the Carberry Municipal Hall to discuss crop depredation by wildlife. The major concern of landowners and land-renters was that of elk and white-tailed deer (Odocoileus virginianus) damage (L. Bidlake, pers. comm.). Concerns were raised about the spread of elk and deer into croplands and the subsequent damage to grain, sunflowers, hay and fences. The latter form of damage resulted in cattle escaping and cross-breeding with different herds of cattle.

On January 28, 1985, the Spruce Woods and Area Wildlife and Game Bird Damage Committee was formed. The Committee formed the following objectives:

1. To obtain reasonable compensation for any game bird or wildlife damage to crops, hay buildings and fences;
2. To suggest methods of decreasing the incidence of damage by use of control methods in Spruce Woods Provincial Park;
3. To suggest adjustments to hunting seasons to minimize damage to fences and crops; and
4. To inform farmers of methods of deterring wildlife and obtaining compensation (L. Bidlake, pers. comm.).

It is interesting to note that although there appears to be concern, no mention of the Shilo Military Reserve was made by the Committee.

2.3.6 Groundwater Quality and Heavy Metal Contamination

Recently there has been some interest on the part of the Manitoba Department of Environment and Workplace Safety and Health and SEAC to determine the effects that shrapnel debris scattered throughout the Reserve has on wildlife and the water supply. SEAC has two proposed projects which would address these interests. One project would assess the ground-water quality in the CFB Shilo-Spruce Woods Provin-

cial Park area, and the other would study the effects of the addition of heavy metals into the environment on ungulates (Minutes of SEAC Meeting, November 29, 1983). These studies were proposed in response to the unusually high concentrations of copper, sodium, and phosphorous which were noted by McKernan (1981) in areas of shell explosions.

2.3.7 Poaching

Illegal hunting had been significant in the 1960's and early 1970's (L. Bidlake, pers. comm.). Since the establishment of Range Patrols and the arrival of West German trainees into areas which were previously used infrequently, poaching is believed to have decreased (S.A. Robak, pers. comm.). At present, poaching on the Reserve is not considered to be a significant problem (S.A. Robak, pers. comm.).

The latest leasing agreement requires that Base Command at Shilo allow at least two weeks of hunting on the Reserve each year. Over the last few years, hunting access has been provided in mid-November (Major L.E. Glover, Base Operation, C.F.B. Shilo, pers. comm.). MDNR control hunting seasons, which species may be hunted and bag limits[1], and hunters are subject to Provincial hunting laws. However, all hunters on the Reserve must be registered with Base Operations and ob-

[1] It should be noted that elk hunting licenses have been reduced in number from 100 to 20 in 1984. The number of licenses issued was reduced because accurate counts of elk had not been possible in the last few years (S.A. Robak, pers. comm.).

tain a range pass. Hunters may only operate vehicles on designated routes, although they have access to anywhere on the Reserve when on foot (Major L.E. Glover, pers. comm.)

2.3.8 Noise and Vibration

Noise and vibration are often the most readily apparent effects of military activities on the Reserve. The radius of impact of noise and vibration is dependent upon the type of military activity being carried out and upon meteorological conditions. The effects of these phenomena decreases with increasing distance from the Reserve. Therefore, the impacts of noise and vibration are primarily isolated to local populations.

2.4 ECONOMIC AND SOCIAL ISSUES

2.4.1 Income and Employment

The existence of CFB Shilo has had significant economic impact on southwestern Manitoba. This is especially true since the arrival of West German troops. The Brandon Chamber of Commerce was reported through the Brandon Sun (Aggerholm and Rance 1982) to have claimed that CFB Shilo feeds $50 million into the southwestern Manitoba economy. A similar figure was quoted by Sullivan (1983). Werier (1982) reported that DND officials in Ottawa estimate that the West Germans at Shilo have spent about $45 million in Canada up to June 30, 1981.

The majority of the economic benefits generated from the existence of CFB Shilo have accrued to the residents of Brandon and residents in the immediate vicinity of the town of Shilo. Plowman (1982) claims that the unincorporated town of Spruce Woods, located adjacent to the Shilo townsite, but outside the Reserve, was developed by private entrepreneurs and land speculators who realized the economic opportunities CFB Shilo afforded.

The economic impact of CFB Shilo on the economy cannot be determined directly because economic multipliers are difficult to specify. However, economic statistics for CFB Shilo in the 1983/84 fiscal year provide some insight into the impact of military expenditures in southwestern Manitoba (Tables 1, 2, and 3).

In fiscal year 1983/84, non-public expenditures were above the usual average of approximately $80 000.00 to $100 000.00 (Lieutenant C.W. McKinnon, pers. comm.). It is expected, however, that DND will increase investment through their base development program because of the new lease signing (Lieutenant C.W. McKinnon, pers. comm.).

GATES expenditure tendencies have been, for the most part, constant over the last five years (Lieutenant C.W. McKinnon, pers. comm.). There has been little change in the number trainees brought in by the West Germans over this period (Lieutenant C.W. McKinnon, pers. comm.) (Table 1).

TABLE 1

Number of Personnel Employed at CFB Shilo

==========

1. Military

    a) Canadian.....984

    b) Canadian (in support of GATES).....29

    c) West German

        i) Permanent (year round).....40

        ii) Temporary (9 months/year).....169

        iii) Trainees (3 weeks/year, 8 times/year).....666[1]

2. Canadian Public Employees

    a) Civilians (in support of GATES).....96

    b) Other Civilians.....404

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[1] Each group of trainees stays for a three week period. There are eight groups of 666 trainees attending GATES each year.

Source: Capt. D. Erickson and Lieutenant C.W. McKinnon, Comptrollers Office, CFB Shilo.

TABLE 2

CFB Shilo Expenditures

1. Public Expenditures	
a) GATES purchases in area	$1 856 947.00
b) Public goods and services in support of Canadian military	$8 121 000.00[1]
2. Non-Public Funds[2]	
a) Canex expansion	$1 600 000.00
b) Shilo Country Club (watering system)	$68 000.00
c) Cable T.V. Company (satellite dish)	$18 000.00
3. Resale Activities (Cost of merchandise sold)	$4 993 135.00[3]

[1] This figure includes only those expenditures that are processed through the Base Comptrollers Office. This figure does not include other National DND purchases. This figure also includes expenditures on teacher's salaries and overtime salaries (i.e., $1 876 000.00).

[2] Non-public funds refer to monies which are collected from private enterprises operating on Base by the military. Base Command decides how this general fund is redistributed to the non-public fund enterprises.

[3] Includes some National contracts.

Source: Capt. D. Erickson and Lieutenant C.W. McKinnon, Comptrollers Office, CFB Shilo.

TABLE 3

CFB Shilo Employee Salaries

1.	Canadian Military (Gross)	$25 656 264.00
2.	GATES	$10 744 000.00
3.	Public Employees	$9 672 830.00
4.	Non-Public Employees (in support of military)	$1 367 105.00
5.	Total	$47 440 199.00

Source: Capt. D. Erickson and Lieutenant C.W. McKinnon, Comptrollers Office, CFB Shilo.

Assuming disposable income is 60% of gross income (which is a reasonable estimate based upon Base Comptroller Office information), civilian and military personnel may spend up to 0.60 X $47 440 199.00 = $28 464 119.40 in the Shilo area (income figure from Table 3).

Much of the economic activity in southwestern Manitoba is not only generated in construction and the primary producer sectors, but also in the retail sector. Especially significant to the situation at Shilo is the fact that West German trainees spend tourist dollars in the retail sector. Most of this activity takes place in the City of Brandon. Thus, not only are income distribution effects created by DND expenditures, but also an increase in net income in the area is generated through West German expenditures.

2.4.2 Amenities

Military personnel, their families, and persons employed on the Base are entitled to use the facilities provided through non-public funds. Persons employed on the Base can purchase memberships which entitle them to use these facilities. These privileges extend to all recreational facilities, all special interest facilities, the Canex shopping centre, and other non-publicly funded services. Technically, private citizens who are not employed on the Base or who are not dependents of military personnel may use only the special interest facilities provided by non-public funds

(Captain G. Esligar, pers. comm.). However, for public relations reasons, the general public is allowed to shop at the Canex (Captain G. Esligar, pers. comm.).

2.4.3 Regional Access

The physical existence of the Reserve, like any other reserve land, may disrupt transportation networks. Because of the nature of land-use and the area of land occupied, the Shilo Reserve affects access to some public roads. The relevant transportation corridors affected are located on the southern and western peripheries of the Reserve (Figure 2). By far the most widely used public road in the area is Provincial Road 340. Local residents can be affected to varying degrees when military activity disrupts access to P.R. 340 or other public roads on the periphery of the Reserve.

It should be noted that the only two remaining river ferries in operation in Manitoba are located directly south of the Shilo Reserve, crossing the Assiniboine River. The Treesbank Ferry is part of P.R. 340 and is operated by the Department of Highways and Transportation. The Stockton Ferry is located east of P.R. 340 (Figure 2). The Ferries are a recreational attraction during the summer months. Military vehicles on public roads north of the Assiniboine River may, therefore, have had some effect on recreational traffic.

The primary responsibility of DND for public transportation at CFB Shilo is the maintenance of the portion of Provincial Road 340 within the Reserve.

2.4.4 Grants in Lieu of Taxes and Road Allowances

In 1976, DND began paying grants in lieu of taxes to the R.M.'s of North Cypress and South Cypress for the land contained within the Reserve. Initially the grants in lieu of taxes were paid on buildings. However, since the passing of Bill C4 by Parliament in January 1980, (administered by the Department of Public Works), grants in lieu of taxes have been paid on land. The Bill stipulates what payments the Crown makes. Grants in lieu of taxes were stipulated to be phased in at 25% of the municipal assessment in 1980, 50% of the municipal assessment in 1981, 75% of the municipal assessment in 1982, and 100% of the municipal assessment in 1983. Grants in lieu of taxes are calculated by multiplying the particular municipal assessment by the mill rate for each municipality.

As stated earlier, DND requested the closure of certain road allowances in the most recent leasing agreement with the Province (Figure 3). At present, these road allowances have not been closed. DND is negotiating whether to have the allowances closed through municipal regulation, or by a Bill in the Legislature administered through the Department of Highways and Transportation (H. Boyce, Property Section,

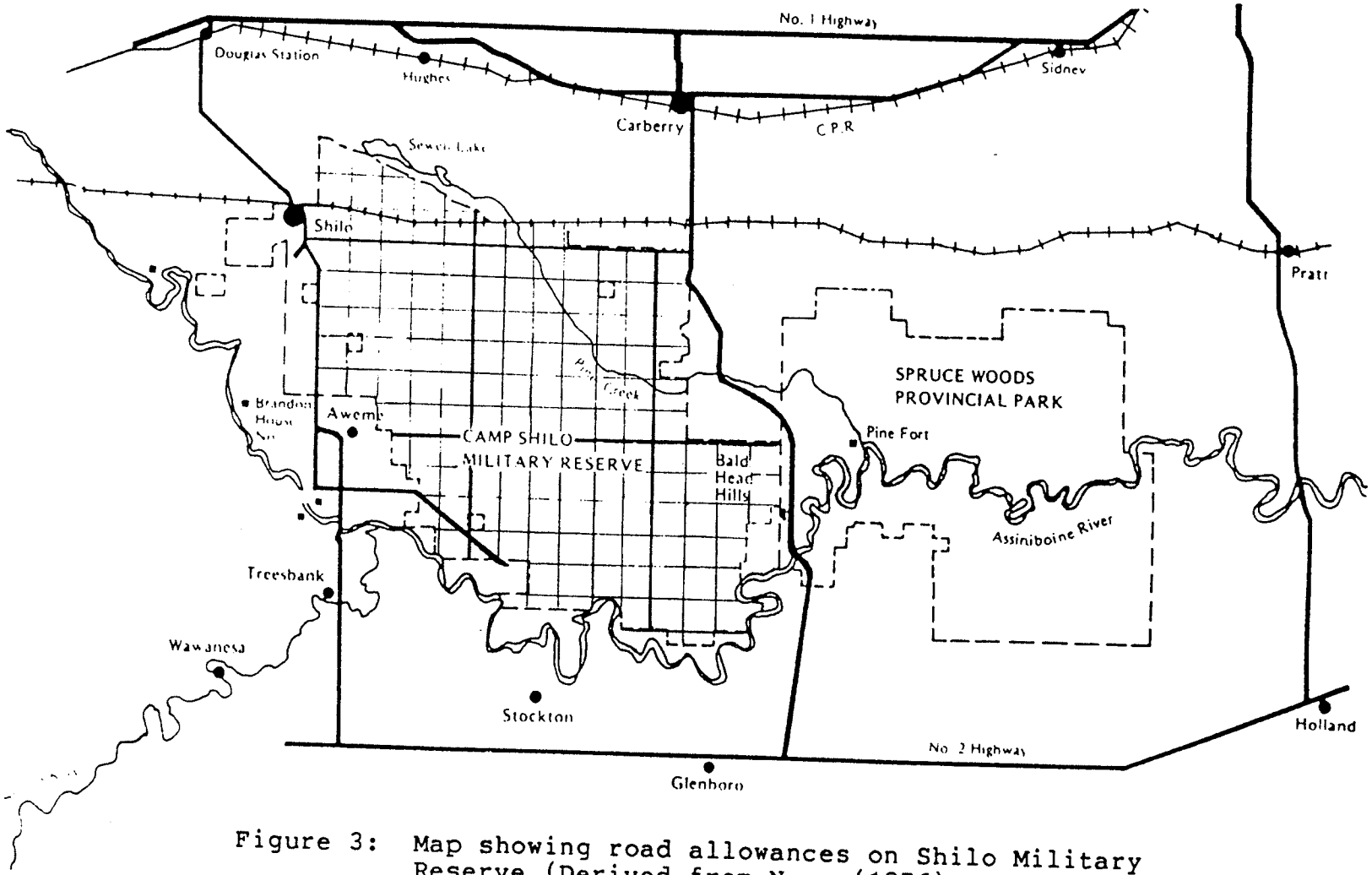

Figure 3: Map showing road allowances on Shilo Military Reserve (Derived from Nero (1976) and Manitoba Department of Municipal Affairs data).

DND, pers. comm.). Once the road allowances are closed they will be assessed by each municipality and the grants in lieu of taxes will be calculated.

2.4.5 Cultural/Sociological

The cultural/sociological impact of West German and Canadian interaction is difficult to assess. Contact between these two cultural groups may have positive and negative effects. However, because it is difficult to consistently define general "positive" or "negative" cultural/sociological impacts, each individual affected must make his/her own assessment. For example, some individuals might perceive the interaction of West Germans and Canadians to be a desired phenomenon, while others might resent, for a wide variety of reasons, the cultural differences of one or the other group.

One attitude toward the West German presence at Shilo was expressed by V. Werier in the Winnipeg Free Press (1982) as follows:

> ...Some naturalists, as well as other citizens, however, take a dim view of German tanks and troops conducting manoeuvres in Manitoba. It is indeed a strange turn of events that our former bitter enemies of the Second World War are practicing for battle on Manitoba soil with 39.6 ton Leopard tanks, and with maps in German and English for the ranges called Aachen, Berlin, Cologne, Deilinghofen and Essen.

Werier (1982; in the Winnipeg Free Press) states that he realizes that Canada has a responsibility to support NATO, but he continues in the same article:

> ...Still, as a native Manitoban, I am not enchanted with the idea of any foreign tanks churning through our soil.

Although this is an example of only one person's opinion, it is not inconceivable that other individuals share similar attitudes.

2.5 PUBLIC PARTICIPATION IN PLANNING AND POLICY MAKING

Public participation in planning and policy making increases the efficiency of bringing public views to action through decision-making (Burton 1971). Efficiency is increased because the probability that a given action will not gain public support is decreased (Sewell 1971). In addition, direct involvement in the decision-making process is based upon the ethical consideration that individuals have the right to be at least consulted on decisions that affect them, "and especially those which involve the expenditure of public funds or which impinge upon the individual's rights" (Sewell 1971).

Participation in planning and policy-making not only provides decision makers with better information, but also functions to educate the public (Sewell 1971). "This seems especially important in those instances where decision making is largely in the hands of a technical elite -- such as engineers, biologists, public health officials, or architects" (Sewell 1971).

Studies of the perceptions and attitudes of the public can be used to provide guidelines for land-use policies. These types of studies may provide important clues as to public preferences relating to the management of resources. Sewell (1971) lists five types of information related to perceptions and attitude that should be particularly relevant to planners and policy makers:

1. the nature of the decision making network, the participants, and their interrelationships;
2. perceptions of the various participants with respect to the problems to be solved and the solutions that might be applied;
3. perceptions of who is responsible for initiating action, and attitudes as to the role of the individual or organization;
4. a determination of the factors which condition particular attitudes and perceptions and account for variations between individuals' attitudes and perceptions; and
5. relationships between attitude, perceptions and behaviour.

It should be noted that although perceptions and attitude studies can provide valuable information to policy makers, they do have their limitations. Some significant limitations include:

1. the possibility of introducing bias into responses;
2. variations in the interpretation of various terms by different respondents;
3. the information generated has a tendency to get out-of-date very rapidly;
4. continuous sampling of a given population may affect responses; and
5. additional information may affect responses (adapted from Sewell 1971).[2]

Other limitations involve the abilities of the personnel carrying out the study, analysis and interpretation of results, and the integration of the data into the policy making process (Sewell 1971). Providing that the limitations are recognized, studies of perceptions and attitude can make a valuable contribution to planning and policy making.

In order to assess attitudes and perceptions it is first necessary to distinguish between the two terms.

There are numerous definitions of attitude in the literature. For example, Churchill (1976) defines an attitude as representing " a person's ideas, convictions, or liking with regard to a specific object or idea". In general, Churchill (1976) presented the following as qualities of attitude:

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[2] Limitations 3, 4, and 5 listed above are highly related, although separate concerns.

1. Attitude represents a predisposition to an object, and, thus, possesses a quality of readiness.
2. Attitude tends to persist over time.
3. There is a relationship between attitude and behaviour. Attitude is felt to be a strong precursor of behaviour, and when manifested produces consistency in behaviour.
4. Attitude has a directional quality. Preferences for outcomes involving an object or phenomenon, evaluations of the object or phenomenon, and affectations for the object of phenomenon are part of attitude.

Kinnear and Taylor (1979) report that attitude is made up of three components: a cognitive component; an affective component; and a behavioural component. The cognitive component refers to a person's awareness of and knowledge about some object or phenomenon. The affective component refers to a person's liking or preference for an object or phenomenon. The behavioural component refers to what a person has done or is doing.

Perception, in the context of this study, is concerned with the impression an individual has of an object or phenomenon (or objects or phenomena), as that impression is modified by the individual's past experience in general, his/her previous experience with that same or similar object or phenomenon, and the individual's physical, emotional, and mental state the moment the object or phenomenon is viewed

or considered (adapted from Schiff 1971). Perceptions may also be a function of the value of the object or phenomenon to the individual (Schiff 1971).

Perceptions are narrower in scope, less stable, and more subject to change than attitudes. Perceptions may or may not have affective and cognitive components (Schiff 1971). The behavioural component of perception differs from that of attitude. That is, a particular behaviour may be a response to the perceptions of a specific object or phenomenon and not a response to a general attitude toward that object or phenomenon.

Beliefs constitute the cognitive component of attitude. Therefore, they are not as inclusive as attitudes (Schiff 1971). However, because beliefs may deal with a variety of aspects of an object or phenomenon, and because the subject of the belief need not be present for the belief to be held, they are more general than perceptions (Schiff 1971). When an individual has a series of beliefs about an object or phenomenon and has an affective reaction to that object or phenomenon, then that individual has an attitude toward that aspect of the environment (Schiff 1971).

2.6 CONCLUSIONS

The development of the Shilo Military Reserve has been a gradual process. The issues related to the Reserve's existence are traceable to the development of the Reserve. However, many of these issues have been especially pronounced since environmental concerns were raised in the mid-1970's. The circumstances surrounding the development of the Reserve, and the related economic, sociological, and environmental issues are unique to the area. Thus, the context of this study plays an integral role in the assessment of the attitudes and perceptions of local landowners.

Many of the issues presented in this chapter are unresolved, in terms of their impacts, because there has not been enough information available to conduct comprehensive assessments. Local landowner opinion can be an important element in the assessment of these issues.

The social role of an attitude and perception study is to provide input into the planning process and to serve as a vehicle for public participation in decision making (Burton 1971). A survey of the attitudes and perceptions of local landowners will indicate to decision makers within DND and MDNR which environmental impacts should have priority and how these impacts may be addressed with respect to local landowner opinion. In addition, the survey will indicate the perceived importance of the effects of the military

presence by those persons who are most directly affected by it.

Chapter III

METHODS

This chapter describes the methods of data collection used in the study. Initially, the target population is defined. A description of the sampling design for the local landowner questionnaire follows. The details of questionnaire design and administration are discussed. A description of the "Government Opinion Survey" is also provided.

3.1 TARGET POPULATION

The attitudes and perceptions of local landowners were canvassed from three general groups -- landowners with property sharing or within 4.8 kilometres (3 miles) of the Reserve boundary, (referred to as adjacent landowners), landowners with property between 4.8 kilometres (3 miles) and 16 kilometres (10 miles) from the boundary of the Reserve, (referred to as non-adjacent landowners), and Local Government officials, (usually referred to specifically).

The survey included only landowners who own land within the municipalities of North Cypress, South Cypress, Cornwallis, and Oakland. The Reeves of North Cypress and South Cypress were excluded from the local landowner survey because they were surveyed as locally elected officials. The Reeves

of Cornwallis and Oakland do not own land within the boundaries of the survey. The target population of local landowners was 728.

3.2 SAMPLING DESIGN

Local landowners were divided into three strata. Two strata involved adjacent landowners, the other involved non-adjacent landowners. All landowners with property sharing the boundary of the Reserve were surveyed (referred to as the adjacent census (AC)). Landowners with property not adjacent to the Reserve, but within 4.8 km of its border were randomly sampled until a sample size of 100 was obtained for adjacent landowners (referred to as the adjacent sample (AS)). A random sample of 200 non-adjacent landowners were surveyed (referred to as the non-adjacent sample (NAS)).

Property ownership maps were used for the selection of all sampling units. All property ownership maps, except for the R.M. of Cornwallis, were obtained through Repromap Ltd., Dauphin, Manitoba. The property ownership map for the R.M. of Cornwallis was obtained from the Manitoba Department of Municipal Affairs. The most recent property ownership maps available were used. For the R.M. of Cornwallis the most recent ownership effective date was June 1982; for the R.M. of Oakland it was February 15, 1984; for the R.M. of North Cypress it was December 7, 1983; and for the R.M. of South Cypress it was January 12, 1984.

Landowners listed on property ownership maps and within the boundaries of the survey (i.e., 16 km radius) were separated into the three strata (AC, AS, and NAS). Each landowner within the boundaries of the survey and listed on the maps was numbered, and a random numbers table was used to select the samples. The addresses of respondents were obtained from the Municipal Assessment Branch of the Manitoba Department of Municipal Affairs.

It is reiterated here that this study is of an exploratory nature. Exploratory research is appropriate for any practical study where little knowledge is available (Churchill 1976). Thus, a pragmatic approach was used to create the distinction between adjacent and non-adjacent landowners and in the selection of sample sizes for the different respondent segments.

Although it had been expected that the attitudes and perceptions of landowners vary in relation to their distance from the Reserve, the actual distance threshold from the Reserve where attitudes and perceptions might be expected to differ can only be postulated after data analysis. Therefore, setting the limit on the adjacent sample to within 4.8 km from the Reserve boundary was done pragmatically.

All landowners sharing the boundary with the Reserve were surveyed because proximity to the Reserve was believed to be an important influence on responses. A sample size of 100

adjacent landowners was chosen because it was acceptable for most cross-tabulation analyses (with an estimated response rate of 30% to 40%). A sample size of 200 for non-adjacent landowners was chosen because the response rate for non-adjacent landowners was expected to be somewhat less than that for adjacent landowners, and this sample size provided a reasonable representation in that area. The representativeness of the sample was determined by comparing certain known population characteristics with those determined through the survey.

3.3 QUESTIONNAIRE DESIGN

The local landowner questionnaire was designed primarily to provide information which would meet the requirements of the objectives of the study. A copy of the questionnaire complete with covering letters is included in Appendix A.

Section 1 of the questionnaire was designed to encourage confidence in the respondent through a series of less difficult questions. The first four questions of this section were included to provide these particular respondent characteristics for group comparison purposes. Question 5 was particularly important in the evaluation of the first general hypothesis of the study. Not all respondents were expected to reside on their land holdings nearest to the Reserve.

Question 6 was designed to determine what kind of influence the Reserve has had on the respondent. Question 7 was included to determine if respondents directly affected by leafy spurge differed attitudinally from respondents not directly affected.

Responses to questions 1 and 2 of Section 2 were explored separately and in combination. Question 1 measured general concern about military activities on the Reserve. Question 2 provided an intensity measure of an extreme point of view. Because "concern" and "positive" are relative terms (i.e., the terms "concern" and "positive" could mean different things to different landowners), answers to questions 1 were correlated to question 2. The results of the correlation reduces the subjectivity inherent in the assessment of these two measures. A six-point scale was used as a measure because it provided a larger range of intensity of feelings than a five-point scale. Kinnear and Taylor (1979) reported that studies have shown no difference in response between six-point and the more typical five-point attitude scales.

Questions 3 and 4 asked respondents for perceptions of benefits and problems associated with the Reserve. Because preliminary research resulted in fewer specific benefits items than problem items, perceptions of benefits were requested first. Question 4(f) is not a known problem associated with the Reserve, but was included as validity check. Questions 3 and 4 were subjected primarily to univariate

statistical analysis. Frequency distributions were then used as an aid in constructing landowner attitudes. These questions also played a role in determining internal consistency of responses.

Questions 3a and 4a asked the respondent to rank the benefit and problem items in questions 3 and 4. The purpose of these questions was to determine which benefits and problems were most important to respondents.

Question 5 was an open-ended question. Open-ended questions were kept to a minimum because of the mail-out format (Dillman 1978). This question was designed to determine if there were other problems and benefits that were not included on the fixed lists in questions 3 and 4. Responses to question 5 were of special interest because of the effort required on the part of the respondent to answer the question.

Question 6 was included to determine whether respondents perceived there was adequate information about military activities and its effects on the Reserve. This question provided the basis for addressing the second general hypothesis of the study.

Responses to questions 7, 8, 9, and 10 provided information that should be helpful to decision-makers who must determine what information should be made available to the public. Question 10 also provided an indication of the lev-

el of interest the respondent has in the study subject.[3]

Questions 8 and 9 were designed to establish the respondent's knowledge or awareness of two important factors relating to CFB Shilo. Question 13 was a somewhat less direct measure of respondent awareness. Responses to these questions aided in the determination of respondent attitudes toward the military presence on the Reserve.

Question 11 provided particular government levels with an indication of how well landowners believe government understands their views. As well, this question was used in the assessment of landowner attitudes toward the military presence on the Reserve. In the latter case, responses were correlated with more direct attitude and perception measures.

Question 12 was an attempt to determine respondents' behaviour in relation to their concerns (i.e., readiness to act). Readiness to act is also a component of attitude and therefore this question was used in conjunction with more direct attitude measures.

Question 14 was included for a similar reason as question 7 -- to provide decision-makers with landowner perceptions of particular institutional obligations and responsibilities. If landowners have false perceptions about who is re-

[3] Determining the level of interest in the topic of a study is an important element in attitude studies (Sheatsley 1983).

sponsible for providing information and compensation, then it becomes politically imperative that these perceptions be corrected.

Section 3 was designed to collect personal respondent characteristics. The section was included to determine whether there was a correlation between these characteristics and attitudes and perceptions. It was placed last on the questionnaire because personal questions sometimes have the lowest response rate. That is, it was hoped that respondents who did not wish to answer personal questions completed the questionnaire at least to the end of section 2.

3.4 QUESTIONNAIRE ADMINISTRATION

Adjacent and non-adjacent landowners received a self-administered mailed questionnaire (see Appendix A). The questionnaires were number coded to facilitate follow-up mailings. Social survey experts at the University of Manitoba were asked to comment and criticize the questionnaire prior to mailing.

The questionnaire was pre-tested two weeks before the initial mail-out on August 10, 1984. Seven individuals within the target population were presented with the questionnaire and asked to complete it without assistance. These respondents were informed of the pre-test goals and asked to critically assess the questionnaire in this re-

spect. Only very slight alterations of the pre-tested questionnaire were required, so further pre-testing was not carried out.

The mail-out survey (300) was initiated on August 10, 1984. Respondents were not provided with a specific date to return the form because it was believed this might frustrate some respondents and result in a lower response rate. Each mail-out questionnaire included an explanatory covering letter outlining the purpose of the survey and motivating the individual to complete and return the questionnaire. Respondents were insured that their responses would be confidential.

A second mailing of 198 questionnaires was initiated on September 24, 1984, to bolster the response rate. The covering letter included with this mail-out is presented in Appendix A.

3.5 DATA PROCESSING AND ANALYSIS

Responses from returned questionnaires were coded onto Fortran Coding Forms using a predetermined coding scheme. The coded information was then transfered into a computer file on the University of Manitoba Amdahl 5850 computer system. Data were analyzed using the Statistical Package for the Social Sciences (SPSSx).

Initially, 97 variables were created. Following recoding, some variables were lumped into a single new variable. Three new variables were created in this manner. The variables created and their labels are listed in Appendix E.

Frequency distributions and contingency tables of responses were used extensively for interpreting the results. Much of the data analysis focused on relationships between variables. The Pearson chi-square test for independent variables was used as an initial step in the analysis of relationships. The chi-square test is appropriate if the data are from random samples and the expected values are not too small (Norušis 1983). However, chi-square tests were used only to support arguments made by the author in interpreting the data.

3.6 GOVERNMENT OPINION SURVEY

Local Government officials surveyed were from the municipal governments of North and South Cypress, Cornwallis, and Oakland, and the town councils of Carberry, Glenboro, and Wawanesa. These officials were surveyed for their perceptions of the situation through various methods of contact. The interviewer used a standardized questionnaire as a framework for the survey (see Appendix B). Many questions on this questionnaire were similar to those on the local landowner questionnaire. However, government officials were asked to predict results of the landowner survey and given

the opportunity to express their opinions on issues related to CFB Shilo.

The Reeves of the R.M.'s of Cornwallis, Oakland, North Cypress, and South Cypress, and the Mayors of Carberry, Glenboro, and Wawanesa were contacted by phone in July and August, 1984, to arrange for an interview. The Reeve of the R.M. of Oakland refused to be interviewed on the grounds that he never had any complaints about the Shilo Reserve and because he felt he had no business interfering with anything related to CFB Shilo. The Reeves of the R.M.'s of North Cypress and South Cypress and the Mayor of Carberry were interviewed in person. The Reeve of the R.M. of Cornwallis and the Mayor of Wawanesa were interviewed by telephone. The Mayor of Glenboro requested that the questionnaire be mailed to his office. This mailed questionnaire differed from the other government questionnaires because it contained more specific instructions to questions, question wording was more specific to a town rather than a municipality, and it contained a space for the respondent's name. The name of the Mayor of Glenboro was the only name indicated on the returned form. Although the methods of data collection differed, the purpose of the local government survey was achieved. That is, the interviews and mail-out provided a local government perspective which could be compared with the attitudes and perceptions of respondents.

Information collected from local government officials was used for descriptive purposes only. Comparisons between the opinions of local government officials and those of local landowners were, therefore, also used for descriptive purposes only.

3.7 SOURCES OF ERROR

3.7.1 Representativeness

An attempt to determine the representativeness of the sample was made. The age and education characteristics of persons living in the R.M.'s of Cornwallis, Oakland, North Cypress, and South Cypress were determined from Manitoba Department of Agriculture and Statistics Canada data. These data were then compared to similar data collected on the local landowner survey. A chi-square test was used to determine if the values obtained in the survey differ significantly from the government data.

The age characteristic data are shown in Table 4. The results show that data collected through the landowner survey, for the age variable, differs significantly (0.05 level) from data on the age of farm operators obtained from the Manitoba Department of Agriculture (Statistical Analysis Section, unpublished data). The ages of farm operators can be compared to the ages of respondents because most respondents are farmers. The data indicate that, in general, the survey included a larger proportion of older (over 55 years)

TABLE 4

Comparison of age of respondent with age of farm operators in the R.M.'s of Cornwallis, Oakland, North Cypress, and South Cypress

(Derived from Manitoba Department of Agriculture data, unpublished).

AGE	FREQUENCY MDA DATA	P(MDA)[1]	FREQUENCY SURVEY DATA	P(SURVEY)
less than 24 years	52	0.048	2	0.014
25-34 years	232	0.214	20	0.136
35-44 years	223	0.206	31	0.211
45-54 years	245	0.226	29	0.197
55-64 years	214	0.197	42	0.286
over 64 years	118	0.109	23	0.156
TOTAL	1084	1.000	147	1.000

chi-square=17.26, d.f.=5
chi-square(0.950, 5)=11.07

[1] probability of occurrence

farm operators than is represented in the population of the four municipalities, and a smaller than representative proportion of younger farm operators (under 35 years). Two possibilities may exist to explain this phenomenon. Firstly, younger respondents may not be interested in filling out the questionnaire, for reasons which cannot be known with certainty. Secondly, the sample design may have selected for older individuals. It is stressed that the target population was not necessarily expected to be representative of all four municipalities as a whole. The fact that cross-tabulations of the AGE variable by the attitude variables (CONCERN and IMPACT) did not yield significant chi-square values (0.05 level of significance) suggests only for this data that AGE and respondent attitudes cannot be concluded to be dependent.

The education characteristics data are shown in Table 5. The results show the data on respondent education level differs significantly (0.05 level) from Statistics Canada data for the four municipalities. In Table 5 it is seen that the "Grade" level and "University" level of education are over-represented in the landowner survey. Because the correlations of respondent education level (EDUC variable) and the attitude variables (CONCERN and IMPACT) were not significant (0.05 level), the dichotomy in the data probably does not have an effect on the conclusions of the study. However, it is difficult to determine if the respondents are representative of the target population.

TABLE 5

Comparison of education level of respondents with education level of residents in the R.M.s of Cornwallis, Oakland, North Cypress, and South Cypress

(Derived from Statistics Canada data (Statistics Canada 1983)).

LEVEL OF EDUCATION COMPLETED	FREQUENCY (STAT.CAN.)	P[1] (STAT. CAN.)	FREQUENCY (SURVEY)	P (SURVEY)
Grade School	1090	0.194	45	0.317
High School	2760	0.492	55	0.387
Technical or Trade School	1175	0.210	21	0.148
University	585	0.104	21	0.148
TOTAL	5610	1.000	142	1.000

chi-square=9.96, d.f.=3
chi-square(0.950, 3)=7.81

[1] probability of occurrence

3.7.2 Typographical errors

A typographical error occurred on question 4(j), section 2 of the landowner questionnaire. The error was corrected for the second mailing of the questionnaire. The error involved the exclusion of the word "near" in the question statement: "limited access to roads near firing ranges during certain times of the year". A comparison of responses received prior to the second mailing with those received after the second mailing for question 4(j), section 2, was carried out. A chi-square test for independence proved to be significant at 0.05 level (Table 6).

It is apparent that the first mailing (the one containing the typographical error) generated more negative ("no") responses to the road access question than were expected (under the assumption of independence). Whereas, the second mailing generated more positive ("yes") responses than were expected. Thus, the typographical error may have suppressed agreement with the problem item. Therefore, it is likely that a greater percentage of respondents than was observed would have agreed that limited access to roads near firing ranges during certain times of the year was a problem.

3.7.3 Recoding Data

It is acknowledged that recoding the values of some variables may result in a loss of information. For example, on

TABLE 6

Cross-tabulation of responses to question 4(j), section 2 (ROADS variable) by date response received (DATE variable)

DATE RESPONSE RECEIVED

ROADS VARIABLE	Before Sept. 24	After Sept. 24	Row Total
Yes	33[1] 38.4[2]	24 18.6	57 53.3%
No	39 33.6	11 16.4	50 46.7%
Column Total	72 67.3%	35 32.7%	107 100.0%

chi-square	d.f.	significance	cells with E.F.< 5
4.02	1	0.045	NONE

[1] Count
[2] Expected Value

attitude scales, scale numbers "3" and "4" are necessarily grouped together. Respondents indicating either one of these scale numbers are lumped into a neutral category. The loss of reliability is suppressed by documentation of all recodes. Additionally, for important variables, responses were also analyzed without recodes.

3.7.4 Non-response and Combining Strata

For the purposes of analysis, the AC, AS, and NAS strata were usually combined. For variables of particular importance to the conclusions of the study, an analysis of the relationship between strata and these variables was undertaken.

Because the AC stratum involves a census, aggregating the data can only be accomplished by assuming that non-response in that census is random or of no consequence to the results. Response to the survey is assumed to be positively related to the interest of the respondent in the topic. Therefore, respondents are likely to have stronger feelings on the topic of the Military Reserve than are non-responders. Aggregating the strata can be used effectively if it can be argued that non-respondents have little effect on the findings of the study. The following paragraphs attempt to determine the nature of non-responders and their potential effects on the findings.

A number of landowners returned uncompleted questionnaires with reasons included (documented in Appendix C). These landowners can provide clues about the nature of non-response. Six of these landowners felt unqualified to answer the questionnaire. Four other landowners provided other explanations for not answering. Three of these four did not respond because they claim that the Military Reserve has had little effect on them. One respondent provided only this comment:

> "Shilo Military Reserve has had little (if any) effect on my life or activities for the past 28 years."

The other one of the four wrote that they were an old couple and did not want to be harassed.

Therefore, it can be assumed that some non-responders do not feel qualified to answer the form, and some do not have any problems or thoughts about the subject. These non-responders would be expected to select scale numbers "3" or "4" on the attitude scales. It is also acknowledged that some landowners did not respond to the survey because they were too busy with the harvest. It is recommended that future surveys in the area be initiated during the agricultural off-season (eg., January). In any event, it is not very likely that non-responders' attitudes would alter the conclusion that local landowners in general are not concerned about military activities and its effects on the Reserve.

Because non-response rates for each strata were similar it is reasonable to assume that non-respondent attitudes are generally consistent over the three strata. Any inconsistencies are assumed to be insignificant. Therefore, the attitudes and perceptions of respondents in different strata can be compared effectively.

3.8 SUMMARY

The methods used to conduct the local landowner survey are statistically valid and replicable. The information generated through the survey should adequately meet the objectives of the study. The government opinion survey was included as a supplementary descriptive tool in the analyses.

Chapter IV

RESULTS AND DISCUSSION

4.1 RESPONSE

Table 7 shows the response rate for the survey broken down into the AC, AS, and NAS strata for each of the three types of response -- respondents who at least partially completed and returned a questionnaire; respondents who returned an uncompleted questionnaire with a note of reasons for doing so[4]; and respondents who did not return a questionnaire (non-respondents).

A total of 148 at least partially completed questionnaires were returned. This represents a response rate of 50.1% (based on 292 total possible respondents). The response rate for AC stratum was greater than that of the other two strata, suggesting respondents owning land adjacent to the Reserve have a greater interest in the topic of the survey.

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[4] See Appendix C for a documentation of all returned, uncompleted questionnaires. Some of the respondents who returned uncompleted questionnaires offered views regarding the military presence on the Shilo Reserve. Some of these were used in the discussion of non-response bias presented in Chapter III.

TABLE 7

Response to Landowner Questionnaire

Respondent Type	Number of possible respondents	Number of respondents	Response Rate (%)
at least partially completed			
AC	36	20	55.6
AS	62	28	45.2
NAS	194	95	49.0
TOTAL	292	148[1]	50.1
not completed, but returned	292	14	4.8
no response	292	130	44.5

[1] Five respondents are from "unknown" strata.

The response rate in general is fairly high considering the amount of effort that went into retrieving responses. Goudy (1978) found that only minor variations appear in variable relationships after approximately 50% of the sample have completed a mail questionnaire, and that almost no differences exist when about 70% of those contacted have returned data. Thus, a 50% return rate for this mail survey is an indication that local landowners are interested in the topic. However, because the target population was small, not as much confidence in the representativeness of the sample can be assumed.

4.2 ATTITUDES TOWARD MILITARY PRESENCE, ACTIVITIES AND ITS EFFECTS

Table 8 and Figure 4 show respondents overall feelings about activities on the Shilo Military Reserve (question 1, section 2) . The results suggest that, generally, respondents are not concerned about military activities occurring on the Military Reserve. This does not mean, however, that the 20 respondents who indicated concern should be disregarded.

Table 9 and Figure 5 show respondent attitudes toward the overall impact of military presence on the Reserve (question 2, section 1). The majority of respondents considered the impact of the military presence to be at least somewhat

TABLE 8

Frequency distribution of responses to question 1, section 2 (CONCERN variable)

OVERALL FEELINGS ABOUT MILITARY RESERVE?

	Scale Number	Frequency	Percentage
absolutely no concern	1	40	27.4
	2	34	23.3
	3	26	17.8
	4	26	17.8
	5	6	4.1
Great Concern	6	14	9.6
TOTAL		146	100.0%

MEAN = 2.77
MODE = 1.00
MEDIAN = 2.00
MISSING CASES = 2

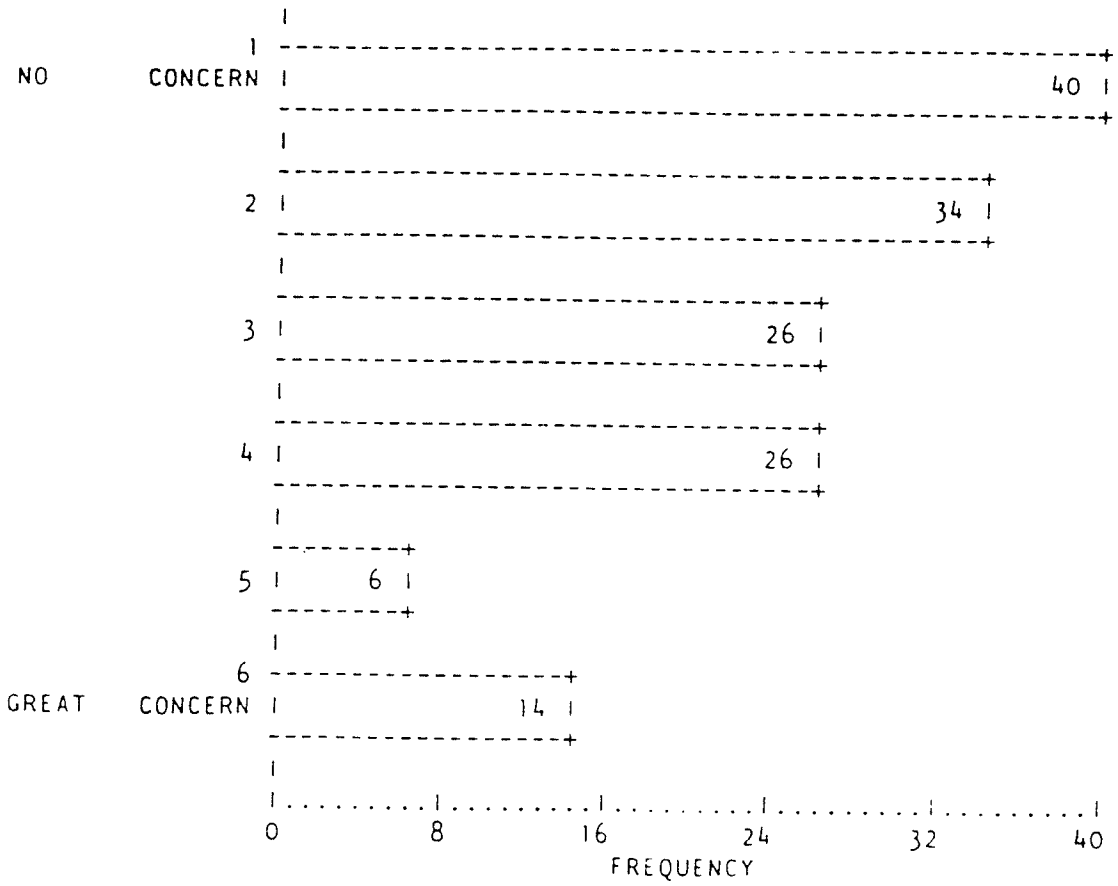

Figure 4: Bar chart showing the frequency distribution of responses to question 1, section 2 (CONCERN)

TABLE 9

Frequency distribution of responses to question 2, section 2 (IMPACT variable)

OVERALL IMPACT IS VERY POSITIVE?

	Scale Number	Response Frequency	Percentage
Strongly Agree	1	24	17.6
	2	22	16.2
	3	34	25.0
	4	25	18.4
	5	16	11.8
Strongly Disagree	6	15	11.0
TOTAL		136	100.0%

MEAN = 3.24
MODE = 3.00
MEDIAN = 3.00
MISSING CASES = 12

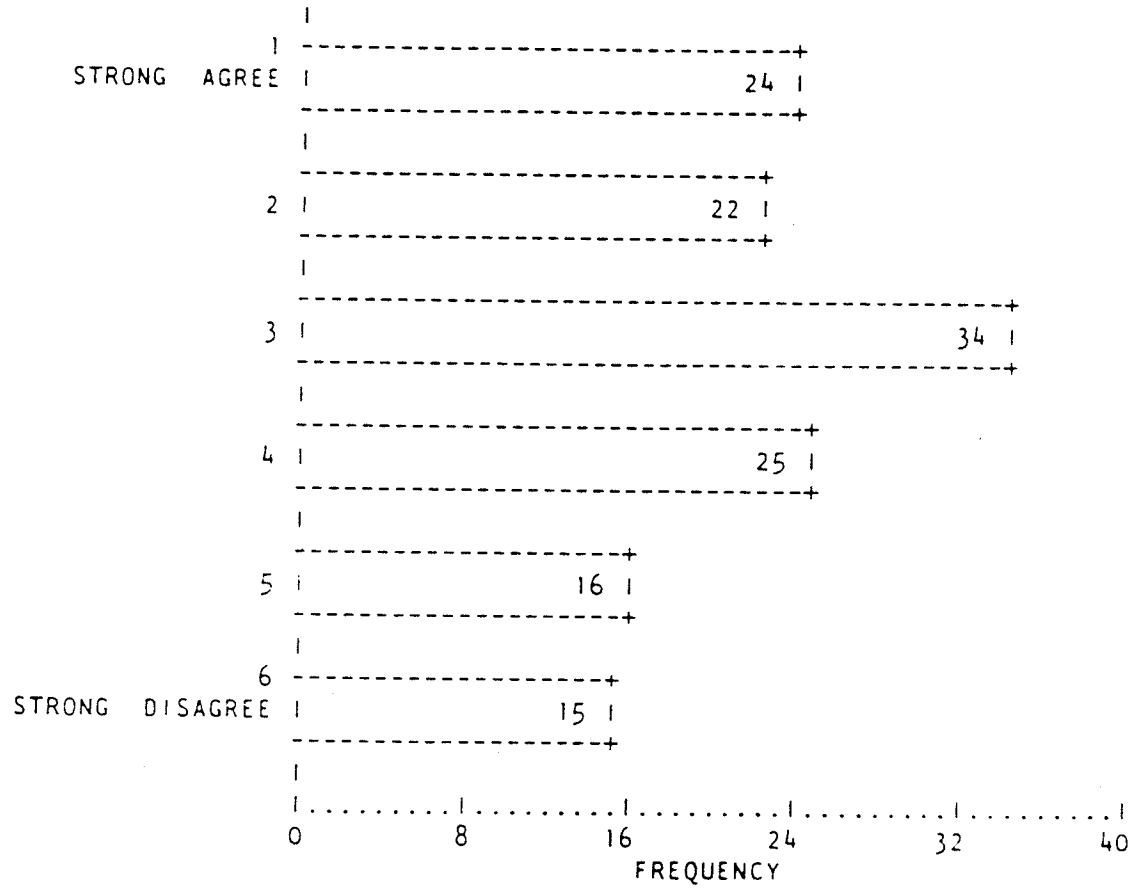

Figure 5: Bar chart showing the frequency distribution of responses to question 2, section 2 (IMPACT)

positive. It is particularly interesting that more respondents selected number 3 on the scale than number 4, in light of question wording which likely biased the scale toward the higher end.[6] Twelve (12) respondents did not answer this question. This compares with two missing values for question 1, section 2 (Table 8). This probably occurred because the IMPACT question asked the respondents for a specific value judgement about the statement, while the CONCERN question was more general and, therefore, likely easier to answer. Respondents not answering the IMPACT question did so probably because they did not feel qualified to make the judgement. For example, one respondent wrote the following at the end of the questionnaire:

> "I don't feel we were able to answer your questions fully but we know practically nothing about military life at or around Shilo."

Another respondent made the following comment which might help to explain the missing values:

> "The Shilo Reserve area is quite a distance from our home and actually does not effect our way of life, so the questions are thought provoking as some of them we haven't even considered before and it's a bit difficult to state an opinion on something that does not effect your daily life directly."

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[6] The adjective "very" modifying the word "positive" in the statement influences responses. Respondents who feel only somewhat positively toward the military presence might be inclined not to agree as strongly with the statement. That is, it was expected that responses would tend to scale number "4" from scale number "3" because of the inclusion of the adjective.

Even with the above comments it is difficult to postulate reasons why respondents did not answer the question, and even more difficult to predict what attitudes non-respondents hold. An examination of the missing values for the IMPACT question for each strata did not suggest that missing values are concentrated in the NAS stratum, as might be expected. The missing values were relatively evenly distributed across the strata. The inclusion of "don't know" and "no opinion" categories may to some extent help to sort out this non-response on future attitude surveys.

The first step in determining variable relationships (i.e., the relationships, if any, between responses as well as respondent characteristics) was to determine if responses vary by strata. This was accomplished by conducting cross-tabulations of relevant variables by the three strata[7]. If responses to questions did not appear to be dependent upon the strata, then for these variables the strata were combined. To aggregate the data in this manner, it was assumed that non-responders in the AC stratum did not differ in their attitudes and perceptions from respondents in this stratum. This assumption introduces bias into some statistical calculations, however, this bias can be accounted for. The implications of this assumption on the findings of this study have already been discussed in Chapter III. The major advantage of aggregating the data was an increased number of

[7] Respondents in the "unknown" strata are necessarily excluded from this analysis.

values per cell and the subsequent increased effectiveness of statistical tests.

There was little relationship between a respondent's "concern" and the strata to which they belong (chi-square=6.40, d.f.=4, P-value=0.171) (Table 10). A number of t-tests were conducted to determine if differences between particular strata might exist for responses to the CONCERN question (Table 11). A significant difference in the mean of the attitude score exists between the AC and the NAS strata (P-value=0.04), and between the AC stratum and the AS and NAS strata combined (P-value=0.05). In each case where the difference in means was significant, the stratum in closer proximity to the Reserve (the AC stratum) had a higher mean score, indicating somewhat greater concern. In no stratum was the mean or median greater than the mean of the scale (i.e., 3.5). Although respondents owning land adjacent to the Reserve are somewhat more concerned about the activities occurring on the Reserve than respondents owning only non-adjacent land, no respondent group (stratum), as a whole, appears concerned.

The cross-tabulation of strata by this IMPACT variable is presented in Table 12. A significant relationship exists between whether respondents agree or disagree that the impact of the Military Reserve is very positive and the strata to which they belong (chi-square=19.79, d.f.=4, P-value=0.0005). Respondents in the AC and AS strata disagreed

TABLE 10

Cross-tabulation of responses to question 1, section 2 (CONCERN) by respondent strata

RESPONDENT STRATUM

CONCERN[1] VARIABLE	Adjacent	Within 3 Miles	Non-Adjacent	Row Total
Scale # 1-2	5 9.6	13 14.1	53 47.3	71 50.4%
Scale # 3-4	10 6.9	10 10.1	31 34.0	51 36.2%
Scale # 5-6	4 2.6	5 3.8	10 12.7	19 13.5%
Column Total	19 13.5%	28 19.9%	94 66.7%	141 100.0%

chi-square	d.f.	significance	cells with E.F.< 5
6.40	4	0.171	2 of 9 (22.2%)

Number of Missing Observations = 7

[1] CONCERN scale: 1 = absolutely no concern
6 = great concern

TABLE 11

t-tests of overall feelings about the Reserve between strata (question 1, section 2)

STRATA	N	MEAN	S.D.[1]
AC AS	19 28	3.421 2.786	1.742 1.686
AC NAS	19 94	3.421 2.628	1.742[2] 1.474
AC AS+NAS	19 122	3.421 2.663	1.742[2] 1.519

[1] All t-values are based on pooled variance estimates.

[2] Denotes a significant 2-tail probability t-values ($P < 0.05$).

TABLE 12

Cross-tabulation of responses to question 2, section 2 (IMPACT) by respondent strata

RESPONDENT STRATUM

IMPACT[1] VARIABLE	Adjacent	Within 3 Miles	Non-Adjacent	Row Total
Scale # 1-2	6 5.8	3 7.7	33 28.5	42 32.1%
Scale # 3-4	4 8.1	10 10.8	45 40.1	59 45.0%
Scale # 5-6	8 4.1	11 5.5	11 20.4	30 22.9%
Column Total	18 13.7%	24 18.3%	89 67.9%	131 100.0%

chi-square	d.f.	significance	cells with E.F.< 5
19.79	4	0.0005	1 of 9 (11.1%)

Number of Missing Observations = 17

[1] IMPACT scale: 1 = strongly agree
6 = strongly disagree

with the statement with a higher frequency than expected, (under the assumption of independent variables), while respondents in the NAS stratum disagreed with a lower frequency than expected. It is interesting that responses from the AC stratum in agreement with the statement did not differ a great deal from what is expected (observed=6 expected=5.6). (Also note the small number of cases per cell). This may be the result of the influence of the proximity to a line on between Brandon and Shilo, or the nature of the issues which are important to the respondent (these factors will be discussed in a subsequent section of this chapter).

The results shown in Table 12 seem to conflict with the results of the cross-tabulation of the CONCERN variable by respondent strata. A cross-tabulation of the IMPACT variable by the CONCERN variable suggests the two variables are dependent (chi-square=24.86, d.f.=4, P-value=0.0001) (Table 13). The apparent conflict then must be explained in terms of differences in what the questions are measuring.

Respondents who indicate concern (Table 8) may be doing so because they do not consider the word "concern" to have a negative connotation. To these respondents the word "interest" may be substituted for the word "concern". Other respondents may indicate concern not because they are worried about some negative aspect of the military presence, but instead because they are concerned that the positive aspects (benefits) of the military presence are not being given

TABLE 13

Cross-tabulation of CONCERN variable by IMPACT variable

CONCERN VARIABLE	Scale # 1-2	Scale # 3-4	Scale # 5-6	Row Total
Scale # 1-2	29 22.7	31 29.1	7 15.3	67 49.3%
Scale # 3-4	12 16.6	25 21.3	12 11.2	49 36.0%
Scale # 5-6	5 6.8	3 8.7	12 4.6	20 14.7%
Column Total	46 33.8%	59 43.4%	31 22.8%	136 100.0%

chi-square	d.f.	significance	cells with E.F.< 5
24.68	4	0.0001	1 of 9 (11.1%)

Number of Missing Observations = 12

enough attention.[8] These individuals may hold similar attitudes to the members of the Brandon Chamber of Commerce. That is, they are concerned that the Reserve may shut down without demonstrated public support. It is assumed that all respondents who are concerned about some negative aspect(s) of the military presence on the Reserve would indicate some degree of concern on the scale in question 1. Thus, it is not surprising that it is difficult to sort out the relationship between the CONCERN variable and respondent strata.

The wording of the IMPACT question was designed to further sort out respondents' attitudes. The wording of this question is less ambiguous than the CONCERN question. It is postulated that this factor contributed to the stronger statistical relationship observed between the IMPACT variable and respondent strata.

The null hypothesis of independent variables could not be rejected for correlations between the CONCERN and IMPACT variables by the RESDIST variable (the distance of the respondent's residence from the nearest border of the Reserve (question 5, section 1))[9]. This suggests that the important criteria differentiating the strata are not necessarily the

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[8] This possible explanation is based upon some respondents who indicated "of great concern" for question 1, section 2 of the landowner questionnaire and strongly agreed that the impact of the military presence was very positive.

[9] Cross-tabulations are not shown. However, chi-square values were not significant at 0.05 level to reject the null hypothesis of independence for any of the wide variety of categories used for the RESDIST variable.

distance of the respondent's residence from the nearest border of the Reserve. However, it is reiterated that one of the differentiating criterion is concluded to be the relative distance of land owned by the respondent from the Reserve boundary.

Cross-tabulations of a number of variables by the variable CONCERN were carried out to determine whether any relationships were apparent. The variables included in this cross-tabulation series are listed in Table 14. In only three of the cross-tabulations could the null hypothesis of independent variables be rejected (at 0.05 significance level). These three cross-tabulations are presented in Tables 15, 16, and 17.

Respondents who indicated they had at least one dependent between the ages of 6 and 12 years (GRADE variable), or between the ages of 13 and 17 years (TEEN variable) responded differently to the question of concern than did respondents without dependents in these age groups (Tables 15 and 16). Although one might expect respondents with dependents to be more concerned, the reverse appears to be the case (see column percentages in Tables 15 and 16). The most reasonable explanation of this phenomenon is that it is a coincidental relationship which is statistically significant. The error in the chi-square probably occurred because of the high percentage of cells with an expected frequency of less than 5 (37.5% in each case).

TABLE 14

List of variables cross-tabulated by CONCERN

YRSOWN	NHAPR
LANDUSE	OTHUILR
CULTIVO	SEAC[2]
FORAGEO	AGE
OTHILO	SEX
WOODO	DEPEND
NHAPO	PRESCH
OTHUILO	GRADE[1]
CULTIVR	TEEN[1]
FORAGER	ADULT
OTHILR	EDUC
WOODR	HUNTING[1]

[1] denotes a significant chi-square value (0.05 level) for cross-tabulation with CONCERN variable.

[2] denotes a significant chi-square value (0.05 level) for cross-tabulation with IMPACT variable.

TABLE 15

Cross-tabulation of whether or not respondents have dependents between the ages of 5 and 12 years (GRADE variable) by CONCERN

DEPENDENTS/CHILDREN

CONCERN VARIABLE	None	At Least One	Row Total
Missing Values	2[1] 1.7[2] 1.6%[3]	0 0.3 0.0%	2 1.4%
Scale # 1-2	67 62.0 54.0%	7 12.0 29.2%	74 50.0%
Scale # 3-4	37 43.6 29.8%	15 8.4 62.5%	52 35.1%
Scale # 5-6	18 16.8 14.5%	2 3.2 8.3%	20 13.5%
Column Total	124 83.8%	24 16.2%	148 100.0%

chi-square	d.f.	significance	cells with E.F.< 5
9.55	3	0.023	3 of 8 (37.5%)

[1] Count
[2] Expected Value
[3] Column Percentage

TABLE 16

Cross-tabulation of whether or not respondents have dependents between the ages of 13 and 17 years (TEEN variable) by CONCERN

DEPENDENTS/CHILDREN

CONCERN VARIABLE	None	At Least One	Row Total
Missing Values	0 1.5 0.0%	2 0.5 5.6%	2 1.4%
Scale # 1-2	58 56.0 51.8%	16 18.0 44.4%	74 50.0%
Scale # 3-4	37 39.4 33.0%	15 12.6 41.7%	52 35.1%
Scale # 5-6	17 15.1 15.2%	3 4.9 8.3%	20 13.5%
Column Total	112 75.7%	36 24.3%	148 100.0%

chi-square	d.f.	significance	cells with E.F.< 5
8.038	3	0.045	3 of 8 (37.5%)

TABLE 17

Cross-tabulation of respondent hunting behaviour (HUNTING variable) by CONCERN

HUNTING BEHAVIOUR

CONCERN VARIABLE	Do Not Hunt	Hunt	Row Total
Scale # 1-2	44 37.5	30 36.5	74 50.7%
Scale # 3-4	25 26.4	27 25.6	52 35.6%
Scale # 5-6	5 10.1	15 9.9	20 13.7%
Column Total	74 50.7%	72 49.3%	146 100.0%

chi-square	d.f.	significance	cells with E.F.< 5
7.770	2	0.021	NONE

Number of Missing Observations = 2

The level of concern was also found to be related to whether or not the respondent hunted wildlife (HUNTING variable). Respondents who hunt tended to be more concerned than respondents who do not hunt (Table 17). This relationship is not surprising. The Shilo Reserve, as mentioned earlier in this report, serves to some extent as a wildlife sanctuary. Although DND controls the access of hunters to the ranges, it also serves as an important hunting area. Thus, it is not surprising that hunters are more concerned than non-hunters about military activities and its effects on the Reserve.

The same variables cross-tabulated by the CONCERN variable (Table 14) were cross-tabulated by the IMPACT variable to determine whether any relationships were apparent. The null hypothesis of independent variables could not be rejected using a chi-square test and a 0.05 level of significance for any correlations except IMPACT by SEAC (correlations based on all respondents) (Table 14).

From Table 18 it is evident that respondents who are aware of SEAC tended to agree that the impact of the military presence was very positive with greater frequency than would be expected under the assumption of independence (observed=10 expected=5.4). Those respondents who disagreed with the IMPACT statement did not differ a great deal from the expected values, whether they were aware of SEAC or not. Thus, the relationship suggests that respondents who are

TABLE 18

Cross-tabulation of responses to question 8, section 2 (SEAC variable) by IMPACT

AWARENESS OF SEAC

IMPACT VARIABLE	Yes	No	Row Total
Scale # 1-2	10 5.4	35 39.6	45 33.6%
Scale # 3-4	3 7.0	56 52.0	59 44.0%
Scale # 5-6	3 3.6	27 26.4	30 22.4%
Column Total	16 11.9%	118 88.1%	134 100.0%

chi-square	d.f.	significance	cells with E.F.< 5
7.27	2	0.026	1 of 6 (16.7%)

Number of Missing Observations = 14

aware of SEAC will tend to agree with increasing intensity that the impact of the military presence is very positive only if those respondents are not strongly predisposed to disagree with the statement. Because the role of SEAC is to evaluate and monitor the effects of the military presence on the environment and because its support comes from DND, it is not surprising that respondents who are aware of its existence feel more secure about the impact of the military presence in the area. It can be argued that as more landowners who are not predisposed to a certain attitude toward the military presence become made aware of the existence of SEAC, in general, a more positive attitude will be fostered toward the military presence. Obviously it appears that making local landowners more aware of SEAC is in the best interests of DND.[10]

Both IMPACT and CONCERN variables were cross-tabulated by responses to question 6, section 1 (EFFECT variable). In each case the null hypothesis of independent variables could be rejected using the chi-square test at 0.05 level of significance (CONCERN by EFFECT: chi-square=14.42, d.f.=2, P-value=0.0007; IMPACT by EFFECT: chi-square=6.41, d.f.=2, P-value=0.04). In both cases, respondents who indicated

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[10] Cross-tabulations between IMPACT and SEAC variables were carried out for each strata separately. Similar tendencies as those observed for all respondents were apparent in the AC and NAS strata. The AS strata did not show a similar tendency. However, for all individual strata the number of valid cases was too low to be considered useful for statistical analysis.

that the military presence or activities had had a direct effect on themselves or their property tended to indicate more concern and a less favourable attitude towards the military presence. This is expected because the majority of the types of effects listed in Part (b) of question 6, section 1, can be considered to be negative effects that the military presence has had on the respondent.[11] Therefore, the attitudes of respondents who have been affected by the military presence or activities are conditioned by the nature of that interaction.

Most respondents (79%) have not had any contact with range control personnel. In addition, most respondents have not had any contact with administrative personnel (77%). From examinations of cross-tabulations of the RANGE variable by CONCERN and the ADMIN variable by CONCERN it is apparent that respondents who contact these individuals tend to have more "concern" (RANGE by CONCERN: chi-square= 8.14, d.f.=2, P-value=0.02; ADMIN by CONCERN: chi-square=7.80, d.f.=2, P-value=0.02). However, cross-tabulations of these two variables (RANGE and ADMIN) by IMPACT do not suggest any dependent relationships. Therefore, it appears that only a level of interest can be readily ascribed to respondents who have had contact with personnel at Shilo, and not a particular attitude. This finding suggests that local landowners do not take their concerns about military activities and its

[11] A description of the effects considered "positive" and those considered "negative" is provided in Appendix E.

effects directly to military personnel.

The null hypothesis of independent variables was also rejected for the correlation of IMPACT and ELECT (question 12, section 2) variables (0.05 level of significance). From Table 19 it is apparent that respondents who had contacted an elected official tended to disagree that the impact of the military presence was very positive. This is not surprising, especially considering the wording of question 12, section 2. The respondents are asked whether they have raised any of their "concerns" about the military effects with any elected officials. If respondents had any "concerns" at all they would be likely to disagree with the IMPACT statement.[12]

A cross-tabulation of the ELECT (question 12, section 2) variable by strata yielded a significant chi-square value (Table 20). More respondents who are in the AC stratum have contacted an elected official than would be expected under the assumption of independent variables (observed=8 expected=3.1). This finding concurs with the conclusion that respondents owning land in proximity to the Reserve are more concerned than respondents owning land more distant from the Reserve.

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[12] A correlation of CONCERN and ELECT also yielded a significant chi-square value (Chi-square=9.95, d.f.=2, P-value=0.007).

TABLE 19

Cross-tabulation of whether respondents have contacted an elected official (ELECT variable) by IMPACT

ELECT VARIABLE

IMPACT VARIABLE	No Contact	Munc., DND or MDNR	Row Total
Scale # 1-2	35 34.9	7 7.1	42 32.3%
Scale # 3-4	53 48.2	5 9.8	58 44.6%
Scale # 5-6	20 24.9	10 5.1	30 23.1%
Column Total	108 83.1%	22 16.9%	130 100.0%

chi-square	d.f.	significance	cells with E.F.< 5
8.59	2	0.0136	NONE

Number of Missing Observations = 18

TABLE 20

Cross-tabulation of whether respondents have contacted an elected official (ELECT variable) by respondent strata

RESPONDENT STRATUM

ELECT VARIABLE	Adjacent	Within 3 Miles	Non-Adjacent	Row Total
No Contact	11 15.9	20 21.0	84 78.1	115 83.9%
Munc,DND or MDNR	8 3.1	5 4.0	9 14.9	22 16.1%
Column Total	19 13.9%	25 18.2%	93 67.9%	137 100.0%

chi-square	d.f.	significance	cells with E.F.< 5
12.66	2	0.0018	2 of 6 (33.3%)

Number of Missing Observations = 11

Whether or not respondents had contacted an elected official about their concerns provides a good indication of the strength of their concerns (as evidenced by the significant chi-square value in Table 19). From Table 19 it is apparent that only 22 (15%) respondents had contacted any elected officials, while 118 (80%) had not. This certainly concurs with other findings that suggest that in general respondents are not concerned about military activities on the Reserve. It also agrees with the finding that there exists a minority of respondents who have had significant complaints about the military.

The above relationships are useful to explore because of the potential influence that constituents might have on their elected officials. It can be assumed that in periods of time when the lease on the Shilo Reserve is not being negotiated, elected officials are likely to receive more complaints than commendations about the military activities or presence on the Reserve. This is because there is little incentive for local residents to make their elected representatives understand how positive they feel toward the military presence during times when the existence of the Base is not in jeopardy. The results of this survey, however, suggest that for the general area surrounding the Reserve, the majority of local landowners at least mildly agree that the impact of the Reserve is very positive and, in general, they are not concerned about activities on the Reserve.

This information should be of use to politicians as they deal with the complaints relative to the military presence, especially in light of the fact that leasing agreements have been negotiated about every ten years and elected officials are usually elected for three to four year terms. That is, elected officials may be able to deal with complaints more effectively given knowledge of the general attitudes and perceptions of their constituents.

4.3 AWARENESS OF LEASING AGREEMENT

Two cross-tabulations are particularly important in addressing the second general hypothesis of the study. These involve respondents' awareness of the leasing agreement between DND and MDNR (LEASE variable; question 9, section 2) and responses to the CONCERN and IMPACT questions (Tables 21 and 22).

In both cases (i.e., for both attitude questions) the null hypothesis of independence could not be rejected at the 0.05 level of significance. Although no specific relationship had been hypothesized it had been expected that respondents who were aware of the lease would be at least slightly less concerned about military activities on the Reserve, but also less favourable in their attitude about the impact of the military presence. Concern was expected to decrease with increased awareness of the lease because it was hypothesized that respondents would feel more secure in the

TABLE 21

Cross-tabulation of responses to question 9, section 2 (LEASE variable) by CONCERN

AWARENESS OF LEASE

CONCERN VARIABLE	Yes Completely	No, not Completely	Row Total
Scale # 1-2	10 7.6	62 64.4	72 50.3%
Scale # 3-4	4 5.3	47 45.7	51 35.7%
Scale # 5-6	1 2.1	19 17.9	20 14.0%
Column Total	15 10.5%	128 89.5%	143 100.0%

chi-square	d.f.	significance	cells with E.F.< 5
1.91	2	0.385	1 of 6 (16.7%)

Number of Missing Observations = 5

TABLE 22

Cross-tabulation of responses to question 9, section 2 (LEASE variable) by IMPACT

AWARENESS OF LEASE

IMPACT VARIABLE	Yes Completely	No, not Completely	Row Total
Scale # 1-2	7 5.1	38 39.9	45 33.8%
Scale # 3-4	5 6.5	53 51.5	58 43.6%
Scale # 5-6	3 3.4	27 26.6	30 22.6%
Column Total	15 11.3%	118 88.7%	133 100.0%

chi-square	d.f.	significance	cells with E.F.< 5
1.28	2	0.527	1 of 6 (16.7%)

Number of Missing Observations = 15

knowledge that DND had extended legal obligations as a tenant on the Reserve (eg. the establishment of SEAC). A less favourable attitude toward impact was expected because many of the environmental problems were emphasized in the agreement (eg. fire control, leafy spurge control, etc.).

Cross-tabulations of IMPACT by LEASE for each strata separately could not be used for statistical analysis because of a low number of valid cases per strata. However, it is evident that respondents in the AC stratum were more aware of the leasing agreement than respondents in either the AS or NAS strata, and respondents in the AS stratum were more aware than those in the NAS stratum. These tendencies should have increased the likelihood that the null hypothesis of independence could have been rejected for the correlation between the IMPACT and LEASE variables. This is because of the relationship between responses to the impact variable and the strata (under the assumption that increased awareness of the lease and an unfavourable attitude toward the military are positively related). Thus, it cannot be concluded that a respondent's awareness of the leasing agreement has an influence on that individual's attitude toward the military presence or activities.

One respondent did specifically mention the influence that an awareness of the leasing agreement had on his level of concern:

> "...We do feel that we should be kept aware of what negotiations are being made when they are

> signing contracts for rental. This past contract was signed by two levels of government, only to discover that all the road allowances had been turned over to German forces. As we have land from Stockton Ferry to Park, all along the river we were greatly concerned."[13]

Perhaps rather than concentrating on trying to determine the effect that an awareness of the leasing agreement has on attitudes, future survey studies should concentrate on isolating and evaluating problem issues so that they may be dealt with before new agreements are signed. A section later in this chapter will utilize the responses to the survey to isolate some of the issues of importance to respondents.

4.4 THE EFFECT OF MUNICIPALITY OF RESIDENCE

Table 23 shows the cross-tabulation of municipality of residence[14] by strata. A chi-square test for independent variables was not significant at the 0.05 level of significance.[15] However, because of the low number of cases the relationship will be examined descriptively.

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[13] All additional comments made by respondents are documented in Appendix D.

[14] For simplicity respondents not living in the R.M.'s of Cornwallis, Oakland, North Cypress, and South Cypress were excluded from this analysis. All recodes of variables for the purposes of cross-tabulations are fixed for each variable unless otherwise indicated. The fixed system of recodes employed for each variable is presented in Appendix E.

[15] It should be noted that the number of cells with expected frequency less than 5 is greater than 20% of the total number cells. Under these conditions the chi-square test may be invalid (Mason et al. 1983).

TABLE 23

Cross-tabulation of municipality of residence (MUNC variable) by respondent strata

RESPONDENT STRATUM

MUNICIPALITY	Adjacent	Within 3 Miles	Non-Adjacent	Row Total
Cornwallis	4 2.9	1 4.4	18 15.6	23 18.4%
North Cypress	4 4.9	6 7.3	28 25.8	38 30.4%
Oakland	0 2.2	3 3.3	14 11.6	17 13.6%
South Cypress	8 6.0	14 9.0	25 32.0	47 37.6%
Column Total	16 12.8%	24 19.2%	85 68.0	125 100.0%

chi-square	d.f.	significance	cells with E.F.< 5
11.57	6	0.0723	5 of 12 (41.7%)

The following descriptive observations are made: The R.M. of Cornwallis appears to be under-represented in the AS stratum and over-represented in the NAS stratum (Table 23 observed vs. expected values); the R.M. of Oakland is over-represented in the AC stratum; and the R.M. of South Cypress appears to be under-represented in the NAS stratum. The differences in the observed and expected values for the R.M. of North Cypress do not appear to be that large.

These apparent discrepancies may be the result of differences in response rates for different municipalities. This suggests that attitudes toward the military presence may vary by municipality. However, cross-tabulations of municipality of residence by responses to the two attitude questions (CONCERN and IMPACT variables) for each strata, in combination and separately, did not suggest any significant relationships. Further cross-tabulations of municipality of residence by responses to question 3, section 2, of the landowner questionnaire showed that respondents in the NAS stratum differ significantly on the basis of municipality in their perceptions as to whether the economic returns generated off the Reserve by the influx of West German Army personnel was a benefit or not(see Table 24). Respondents from the R.M.'s of Cornwallis and Oakland in the NAS stratum all agreed that economic returns generated by the influx of West German Army personnel were benefits attributable to the military presence. A smaller percentage of respondents from

TABLE 24

Cross-tabulation of municipality of residence by responses to question 3(b), section 2 (ECOWESTG variable)(NAS stratum only)

MUNICIPALITY

ECOWESTG VARIABLE	Cornwallis	North Cypress	Oakland	South Cypress	Row Total
Yes	15 12.3	15 16.3	9 7.3	10 13.1	49 81.7%
No	0 2.8	5 3.7	0 1.6	6 2.9	11 18.3%
Column Total	15 25.0%	20 33.3%	9 15.0%	16 26.7%	60 100.0%

chi-square	d.f.	significance	cells with E.F.< 5
9.91	3	0.0194	4 of 8 (50.0%)

the R.M.'s of South Cypress and North Cypress in the NAS stratum were convinced of this. This tendency was not borne out in the other strata. However, the other strata have very low numbers of valid responses.

Cross-tabulations of municipality of residence and responses to question 4, section 2, for each strata also suggested some dependent relationships. In general, respondents from the R.M. of Cornwallis tended to disagree that the problem items listed in question 4 were problems, while respondents from the R.M. of South Cypress tended to agree that the problem items listed were problems.

Thus, based on response tendencies within municipalities it can be argued that the effect of the geographical distance of a respondent's land holdings from the Reserve (as represented by the different strata) on attitudes and perceptions is somewhat complicated by the respondent's municipality of residence. This argument can be used to explain the response frequencies evidenced in Table 23. Respondents from the R.M. of South Cypress tended to perceive more problems associated with the military presence and therefore would be expected to have a high response rate to the questionnaire. In addition, those respondents owning land in proximity to the Reserve (the AC stratum) also had more interest and generated a higher response rate (Table 23). The combined effect is that respondents in the AC stratum in the R.M. of South Cypress would have the highest response rate

relative to other strata in the municipality, and relative to other municipalities in that strata. The opposite is the case for the R.M. of Cornwallis. A low level of concern was associated with the NAS. Therefore, as is apparent in Table 23, the R.M. of Cornwallis was over-represented in the NAS.

In the Background segment of this report it is implied that the R.M. of South Cypress tends to be more negatively than positively affected by the military presence. (For example, the grants in lieu of taxes issue). This implied tendency is borne out by the results of the survey. The R.M. of South Cypress is located directly south of the Reserve. The southern and south-eastern portion of the Reserve contains two major firing ranges -- Cologne and Deilinghofen (Figure 6). These are only two of five major firing ranges on the Reserve, but they are the closest to the Reserve boundary. Because of their proximity to these ranges the potential for annoyance from military activities is, therefore, greater for residents of South Cypress than for other surrounding municipalities. Alternatively, the R.M. of Cornwallis is directly connected with the economic centre of the Shilo Reserve -- the Shilo townsite -- and relatively more removed than the R.M. of South Cypress from major artillery ranges.

The above arguments have concentrated on the influence of the municipality of residence of respondents. However, municipality of residence, with respect to its influence on

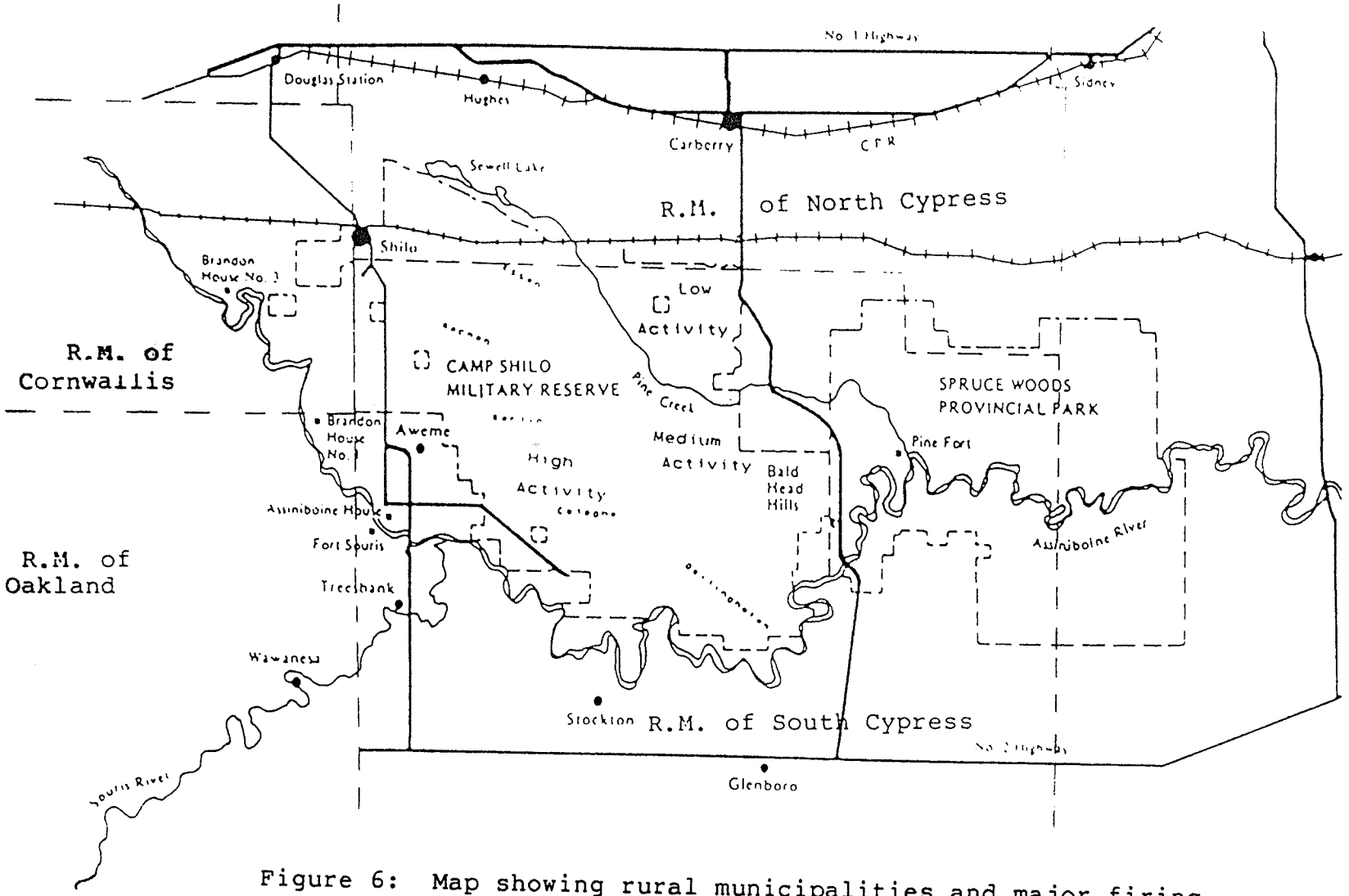

Figure 6: Map showing rural municipalities and major firing ranges on the Shilo Military Reserve (Adapted from Nero (1976) and Nilsson (1984)).

attitudes, is likely a secondary measure of the respondent's proximity to military firing ranges and/or a line between Brandon and Shilo. That is, political boundaries are not likely to be a primary influence on landowner attitudes, but rather, attitudes are more likely influenced by the respondent's proximity to the various forms of military activity. This hypothesis should be tested in future surveys in the area.

4.5 LOCAL GOVERNMENT OPINION

The views of locally elected officials can be used to provide some insights into the attitudes and perceptions of local landowners. This is especially true for assessments of differences in attitudes and perceptions between municipalities. The perceptions of the locally elected officials interviewed are summarized in Table 25.

4.5.1 R.M. of South Cypress

The Reeve indicated that for the R.M. of South Cypress, friction with DND does exist. He indicated that the sources of friction seem to be isolated instances that add up. For example, at the time of the interview the issue of the closure of road allowances on the Reserve was generating some concern in South Cypress. Thus, it is not surprising that the municipal government strongly disagrees that the impact of the military presence is very positive (Table 25). Although many residents of South Cypress have no concerns

TABLE 25

Summary of Responses by Local Government Officials

	Question 1	Question 2	Question 3	Question 6
Municipality or Town	Overall Concern of Munc. or Town	Overall Concern of Proximal Residents	Overall Impact of Reserve	Amount of Information
South Cypress	3[1]	4[2]	6[3]	4[4]
Cornwallis	1	1	1	1
North Cypress	1	3	2	2
Carberry	1	NA[5]	2	2
Glenboro	1	NA	1	3
Wawanesa	3	NA	2	5

[1] Six-point scale for Question 1: 1 = of absolutely no concern
6 = of great concern

[2] Six-point scale for Question 2: 1 = of absolutely no concern
6 = of great concern

[3] Six-point scale for Question 3: 1 = strongly agree (impact very positive)
6 = strongly disagree

[4] Six-point scale for Question 6: 1 = strongly agree (adequate amount of information)
6 = strongly disagree

[5] Not applicable.

about the Reserve, some residents are very concerned and their concerns are echoed by the municipal authority.

The Reeve of South Cypress indicated that there really were no benefits accruing to the municipality as a result of the military presence. He did, however, acknowledge that economic benefits were available to other regions; especially the City of Brandon. The Reeve indicated that noise and vibration, limited access to roads (especially in the winter), and the collection of taxes from DND were problem issues.

Finally, the Reeve indicated that the municipality communicates with the administration at CFB Shilo as problems arise, and that there was no difficulty in establishing this communication.

4.5.2 R.M. of Cornwallis

In contrast, the Reeve of the R.M. of Cornwallis was totally positive toward the military presence on the Reserve. He also believed that residents living in proximity to the Reserve would have absolutely no concerns because many were retired or former army personnel.

The Reeve of Cornwallis also agreed that the economic activity occurring outside the Reserve because of the military presence, the economic returns generated off the Reserve by the influx of West German Army personnel, and the social

(cultural) interaction of West German soldiers with Canadians were benefits owing to the existence of the Military Reserve. He also indicated that the R.M. of Cornwallis benefitted from the access to some of the recreational and shopping facilities at Shilo. The Reeve did not believe that any of the problem items listed in question 5 of the local government questionnaire were problems, even though some of the items listed, he said, did occur. He indicated that any problems arising are taken care of by the military.

The Reeve indicated that there was "very good" communication between the R.M. of Cornwallis and the administration at CFB Shilo.

4.5.3 R.M. of North Cypress

The Reeve of the R.M. of North Cypress described the overall feeling of the municipality as a whole as one of absolutely no concern (scale number "1") about the military activities occurring on the Reserve (Table 25). However, he believed that the overall feelings of residents in proximity to the Reserve would be characterized by slightly more concern (scale number "3"). He reasoned that these residents sometimes feel threatened by fires on the Reserve.

The Reeve of North Cypress stated that the economic returns generated of the Reserve by the influx of West German Army personnel was the greatest benefit that the military

presence provided to North Cypress. The benefit is realized in the form of taxes collected on buildings which the German Army occupies. The Reeve, however, also agreed that the other two benefit items listed in question 4 of the local government official questionnaire were beneficial.

Two of the eleven item problem list were considered problems by the R.M. of North Cypress: controlled burns (and, more specifically, wildfires), and damage to property from wildlife originating from the Reserve. Fires were considered the most significant of the two problems. Both of these problems are related to the high percentage of woodland area on the North Cypress side of the Reserve. The woodland is good habitat for elk and deer (increasing the potential for depredation problems) and is highly susceptible to wildfires.

The Reeve stated that communication between the R.M. of North Cypress and the administration at CFB Shilo is adequate.

4.5.4 Local Government Opinion in Relation to Respondents

The perceptions of the Reeves interviewed appear to reflect the perceptions of their respective constituents. Respondents from the R.M. of South Cypress seem to have the greatest concerns about the military presence, of the four municipalities in question, and their attitudes are echoed

by the Reeve of South Cypress. Respondents from the R.M. of Cornwallis tend to have the most favourable attitudes toward the military, and this tendency is supported by the Reeve.

The Reeve of South Cypress generally views the military presence in a less favourable light than most respondents in his constituency. However, he tends to perceive only a few specific problems related to the military, even though many more problems are perceived by some of his constituents. The Reeve of Cornwallis generally views the military presence in a more favourable light than respondents in his constituency. In addition, he perceives no problems related to the military, even though some of his constituents perceive problems.

4.5.5 Local Incorporated Towns

The Mayors of Glenboro and Carberry indicated that they had absolutely no concern about military activities on the Reserve. The Mayor of Wawanesa also indicated little concern, however, not to the extreme of the other two Mayors. All three Mayors agreed that the overall impact of the military presence was positive (Table 25).

The Mayor of Carberry agreed with the list of benefit items in question 4 of the local government questionnaire. The Mayors of Glenboro and Wawanesa agreed to the two economic benefit items listed in question 4, but did not know

whether the social interaction of West German soldiers with Canadians was a benefit. All three Mayors considered the economic activity generated outside the Reserve because of the military presence to be the greatest overall benefit of the three items. The Mayor of Carberry added that the military is very helpful and cooperative, and provide recreational facilities when available. The Mayor of Wawanesa also indicated the benefit of access to the recreational facilities at Shilo and added that school children benefit from field trips to the Shilo Military Museum.

All three Mayors agreed that wildlife disturbance was a problem associated with the Reserve. Limited access to roads is considered a problem at certain times by both the Mayors of Carberry and Wawanesa. The Mayor of Glenboro agreed that the loss of agricultural land to the Reserve was a problem. The Mayor of Carberry also added that fires in spring were a concern.

Both the Mayors of Carberry and Glenboro agreed that there was an adequate amount of information provided to the public about military activities and their effects on the Reserve, and communication with CFB Shilo was not a problem. The Mayor of Wawanesa disagreed. He reported that the town received most of its information through the media.

The perceptions of the Mayors, as determined from their responses, relative to those of the Reeves interviewed are a

function of the differences in their experiences with the Reserve. The perceptions of the Mayors are generally positive toward the military. It is likely that the Mayors' views are representative of their respective constituents because the views or all three Mayors are fairly consistent. It is also likely that if some residents of any of these towns were greatly concerned about matters related to the Military Reserve, the Mayor of that town would echo those concerns.

4.6 PERCEIVED BENEFITS AND PROBLEMS

4.6.1 Benefits

Although thus far the analysis has shown that in general respondents were not overly concerned about the military presence on the Reserve, it is still useful to examine the perceptions of respondents with respect to the benefits and costs of the existence of the military Reserve. In addition, there are a number of respondents (although a minority) who hold unfavourable attitudes toward the military presence, and their perceptions of the costs of the military presence are particularly important. The analysis in this section will be concentrated on responses to questions 3, 4, and 5 of section 2 of the landowner questionnaire, as well as additional comments supplied by respondents.

Table 26 shows the frequency distribution of responses to each benefit item listed in question 3, section 2 of the

TABLE 26

Frequency distribution of responses to benefit items in question 3, section 2 (ECOACT, ECOWESTG and SOCIAL variables)

RESPONSES

VARIABLE	Yes	No	Don't Know	Missing Cases
ECOACT	89(60.1)[1]	16(10.8)	36(24.3)	7(4.7)
ECOWESTG	86(58.1)	14(9.5)	41(27.7)	7(4.7)
SOCIAL	33(22.3)	15(10.1)	92(62.2)	8(5.4)

[1] Figures in brackets are percentages of total = 148.

landowner questionnaire. The majority of respondents (60%) agreed that the economic activity generated outside the Reserve because of the military presence was a benefit, while 11% indicated it was not. This finding suggests that most respondents perceive the military presence as generating economic benefits to the surrounding area.

Again, a majority of respondents (58%) agreed that the economic returns generated off the Reserve by the influx of West German Army personnel was a benefit, while only 10% did not (Table 26). This finding suggests that the majority of respondent perceive that the presence of the West German Army generates revenue and other economic benefits in the area.

Most respondents (62%) indicated they did not know if the interaction of West German soldiers with Canadians was a benefit (Table 26). The wording of the question lends itself to many interpretations, and therefore is probably responsible for the confusion. Perhaps the word 'cultural' should be substituted for 'social' for future studies of this issue.

Table 27 shows the frequency distribution of responses to the question on which of the three potential benefits listed is of the greatest overall benefit. Sixty one (41%) respondents chose the item listing the economic activity generated because of the military presence to be of the greatest

TABLE 27

Frequency distribution of responses to question 3a), section 2 (BENEFIT variable)

GREATEST OVERALL BENEFIT

VARIABLE	Response Frequency	Percentage
ECOACT	61	41.2%
ECOWESTG	34	23.0%
SOCIAL	11	7.4%
Missing Cases	42	28.4%
TOTAL	148	100.0%

Valid Cases = 106

overall benefit. Forty two (28%) respondents did not answer the question. It is likely that many of the non-responders could not decide between the benefit items. Overall, however, the majority of respondents perceive some benefits of the military presence and the majority of these believe that the economic activity generated because of the military presence is of the greatest overall benefit.

A total of 30 respondents listed other benefits in response to question 5, section 2. Some of these additional benefits overlap with the list of benefits provided in question 3, section 2. However, each listing is considered of special interest because the additional effort required to write out a perceived benefit suggests strong conviction in that perception.

Six respondents indicated that the economic returns to Brandon are a benefit of the military base. Six other respondents indicated that military training on the base is of benefit. Six respondents indicated that the additional employment opportunities the Base provides for area residents is beneficial. One respondent made the point very clear with this comment:

> "If it were not for the Germans at Shilo and the British at Suffield[16] we wouldn't have much of a tank army in Canada, we badly need these bases."

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[16] The respondent is referring to CFB Suffield, Alberta.

Three respondents claimed that the military base was in an ideal location, suggesting that it was beneficial to make good use of the Reserve land. As one respondent stated:

> "The Shilo base is located on sandy waste land. I am pleased to see the land used constructively."

Two respondents indicated that the access to amenities at the Shilo townsite were a benefit. Other benefits which were listed included: the availability of military assistance during disasters and emergencies; social opportunities and social functions on the Base; well maintained roads; the military as good neighbours; military control of access to the Reserve, thus protecting the natural environment; controlled burns carried out by the military provide succulent tender growth for elk; the availability of soldiers to employ during harvest; and general economic benefits. Thus, respondents listed a wide variety of benefits of the military presence, some of which consider general benefits to the area and some which involve personal experiences.

4.6.2 Problems

Table 28 shows the frequency distribution of responses to each problem item listed in question 4, section 2. The majority of respondents (51%) did not agree that noise was a problem. It is likely that a respondent's perception of noise is influenced by the respondent's attitude toward the military, proximity to high-use areas of the Reserve (firing ranges), and duration of residency in the area. This

TABLE 28

Frequency distribution of responses to problem items in question 4, section 2

VARIABLE	RESPONSES			
	Yes	No	Don't Know	Missing Cases
NOISE	51(34.5)[1]	75(50.7)	14(9.5)	8(5.4)
WILDL	66(44.6)	55(37.2)	23(15.5)	4(2.7)
BURNS	61(41.2)	45(30.4)	36(24.3)	6(4.1)
VEGTN	47(31.8)	52(35.1)	41(27.7)	8(5.4)
LSPURGE	64(43.2)	31(20.9)	50(33.8)	3(2.0)
FERRY	11 (7.4)	54(36.5)	78(52.7)	5(3.4)
GRWATER	10 (6.8)	55(37.2)	77(52.0)	6(4.1)
POACH	34(23.0)	43(29.1)	64(43.2)	7(4.7)
HUNT	57(38.5)	47(31.8)	38(25.7)	6(4.1)
ROADS	57(38.5)	50(33.8)	36(24.3)	5(3.4)
AGLOSS	30(20.3)	86(58.1)	25(16.9)	7(4.7)
DEPRED	41(27.7)	63(42.6)	39(26.4)	5(3.4)

[1] Figures in brackets are percentages of total = 148.

conclusion is made based on inferences from comments made by a number of respondents. Two respondents made comments which are good examples of this idea:

> "...Shilo has always been there since I can remember. It's a fact of life I hardly think of because I'm so used to its presence."

> "I have lived/worked at Shilo periodically for over 30 years. I firmly believe the "Base" is a "God-send" to Brandon and area (economically). As we live about 7 miles from Shilo we often hear the guns firing, but they have little affect on us as far as noise is concerned."

Some common elements can be found in comments made by a number of respondents with respect to the problem of noise. These are: artillery fire (noise) on evenings and weekends (especially Sunday mornings); vibrations from shelling rattling windows and shaking the foundations of houses; and noise as a nuisance to both individuals and livestock. Some comments by respondents which exemplify these elements are provided below:

> "...As mentioned in this questionnaire, there is concern for the effect of the very heavy artillery fire on our brick house, the windows of which rattle quite severely during the firing."

> "...The shooting is very disturbing at most times, especially in the P.M.. Our house vibrates, windows are shook loose, etc."

> "The noise is so bad that there are nights when we get no sleep at all. The bomb and shell shock is so strong that plaster in the house is cracked, the pictures jump on the wall, the doors open and the windows rattle. The noise also make the cattle very restless."

> "Too much noise from bombing or shooting on <u>Sunday</u> mornings. Will be quiet during the week but most Sunday mornings (early) it is so loud the house vibrates."

The Mayor of Carberry also indicated that although he did not consider noise to be a problem, it seemed to get worse on weekends. Obviously, respondents who have noise and vibration problems feel strongly about the issue.

Sixty-six (45%) respondents considered wildlife disturbance to be a problem, while 55 (37%) did not (Table 28). The cross-tabulation of WILDL (question 4(b), section 2) by RESDIST (Table 29) should aid in the assessment of these perceptions, as well as help to explain why the null hypothesis of independent variables could not be rejected for the cross-tabulations of RESDIST by IMPACT and CONCERN. Respondents who live more than 10 miles (16km) from the Reserve border tended to consider wildlife disturbance a problem with greater frequency than expected (observed=20 expected=13.6)(under the assumption of independence). In addition, respondents who live in proximity to the Reserve disagreed that wildlife disturbance was a problem with greater than expected frequency. Perhaps residents in proximity to the Reserve tend to have greater direct experience with wildlife on the Reserve, and therefore tend not to be concerned about wildlife disturbance. As one respondent bordering the Reserve commented:

> "...In regard to wildlife in our area, bordering the Shilo range, there seems to be plentiful number of deer, elk, coyote, etc. I welcome the opportunity to fill in this questionnaire, as a hunter and conservationist my concern would be to maintain this area's rich and diverse wildlife habitat."

TABLE 29

Cross-tabulation of responses to question 4(b)(WILDL variable) by distance of residence from nearest border of Reserve (RESDIST variable)

DISTANCE OF RESIDENCE

WILDL VARIABLE	Within 3 Miles	4 to 10 Miles	Over 10 Miles	Row Total
Yes	12 15.3	34 37.1	20 13.6	66 54.5%
No	16 12.7	34 30.9	5 11.4	55 45.5%
Column Total	28 23.1%	68 56.2%	25 20.7%	121 100.0%

chi-square	d.f.	significance	cells with E.F.< 5
8.64	2	0.0133	NONE

In order to evaluate why respondents living at different distances from the Reserve felt differently about the question of wildlife disturbance the reasons behind their perceptions must be determined. This is a question for future perception studies of the area.

That perceptions about wildlife disturbance differed with the respondent's proximity to the Reserve perhaps explains why overall attitude and residence distance from the Reserve cannot be said to be dependent. Some of the factors that influence attitudes toward the military, such as perceptions of the issue of wildlife disturbance, tend to increase in importance to respondents as one moves greater distances from the Reserve boundary.[17] Alternatively, factors such as the perceptions of the issue of property depredation by wildlife (described later in this chapter) decrease in importance with respondent distance from the Reserve. Because

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[17] It is acknowledged that the term "wildlife disturbance" may be interpreted in different ways by different respondents. For example, some respondents might interpret damage to their property (fencelines, crops, etc.) to be wildlife disturbance. However, the apparent relationship between perceptions of wildlife disturbance and residence distance from the Reserve boundary suggests that most respondents were not associating wildlife disturbance with depredation. A cross-tabulation of WILDL and DEPRED variables did not yield a significant chi-square value (chi-square=3.05, d.f.=1, P-value=0.0809)(Table 30). It seems likely that agreement by respondents with the two problem items was probably associated with overall "negative" attitudes toward the military. The cross-tabulation in Table 30 does not suggest that respondents confused wildlife disturbance with depredation. It is most likely that most respondents who indicated that wildlife disturbance was a problem did so because they believed that military activities were in some way degrading the wildlife environment.

TABLE 30

Cross-tabulation of DEPRED variable by WILDL variable
(question 4, section 2)

WILDL VARIABLE	Yes	No	Row Total
Yes	23 18.8	25 29.2	48 49.5%
No	15 19.2	34 29.8	49 50.5%
Column Total	38 39.2%	59 60.8%	97 100.0%

chi-square	d.f.	significance	cells with E.F.< 5
3.05	1	0.0809	NONE

an attitude toward the military presence is influenced by many factors, it is very difficult to precisely define cause and effect relationships.

One conclusion that can be readily drawn from this complexity is that the direct experience of a respondent with an issue influences his/her perception of that issue. Many respondents who agreed that wildlife disturbance was a problem are likely not to have had direct experience with the issue because much of the concern was from respondents more distant from the Reserve. It is likely that their perceptions were influenced more by public opinion (media reports, etc.) than by personal experience. As stated previously, respondents owning land adjacent to the Reserve are relatively more concerned than respondents owning land not adjacent to the Reserve. This conclusion suggests that respondents owning land adjacent to the Reserve, but residing some distance away from the Reserve, are less influenced by public opinion on issues related to the Reserve.

Sixty-one (41%) respondents agreed that controlled burns were a problem, while 45 (30%) did not (Table 28). The question is susceptible to a number of interpretations. However, fires do appear to be a concern of many respondents for primarily one or both or the following reasons:

1. the threat of wildfires; and/or
2. the destruction of vegetation on the Reserve.

The issue of wildfires was not raised in question 4, section 2, but three respondents listed it as another problem. Concerns about the degradation of the environment were echoed in comments from a number of respondents. One respondent made his view clear with the following comment:

> "....During summer months, on many occasions we see smoke from fires on the Shilo ranges and we are concerned as to their effect on the fragile ecology there..."

Slightly more respondents disagreed than agreed that vegetation trampling on the Reserve was a problem (Table 28). In addition, a relatively high percentage of respondents indicated they did not know if it was a problem. These findings suggest that relative to its influence on perceptions about wildlife disturbance, public opinion has not played as great a role in shaping respondents' perceptions toward vegetation trampling. The high degree of uncertainty may also be related to the fact that the vast majority of respondents (87%) were not aware of the existence of SEAC. Had they been aware, they probably would have heard of the various vegetation studies SEAC is planning.

A majority of respondents agreed that the proliferation of leafy spurge and other noxious weeds was a problem associated with the military presence (Table 28). Again, a relatively high percentage of respondents indicated they did not know if the proliferation was a problem. A number of respondents who made additional comments mentioned leafy

spurge specifically. It seems apparent that although "other noxious weeds" are mentioned in the question, respondents recognized the proliferation of leafy spurge to be the issue. From these comments it is also apparent what opinions were reflected by the responses to the leafy spurge question. Individuals who agreed that it was a problem associated with the military believe that the military is at least partially responsible for the spread of the weed. With reference to the Shilo Reserve, one respondent commented:

> "...but I do know that the noxious weeds are not kept under control."

No significant dependent relationship could be observed between respondents who agreed the proliferation of leafy spurge and other noxious weeds was a problem associated with the military and the respondents' personal experience with leafy spurge (For LSPURGE by SPURGE7: chi-square=0.006, d.f.=1, P-value=0.98; for LSPURGE by SPURDIST: chi-square=2.09, d.f.=2, P-value=0.35). Therefore, perceptions about the proliferation of leafy spurge do not appear to depend on personal experience with the weed or the distance from the Reserve of a spurge infestation on a respondent's property.

Based on comments from respondents who disagreed that leafy spurge proliferation was a problem, it is likely that some individuals who indicated they did not know about the problem item did so because they were unsure that military activities were responsible.

Individuals who felt that the proliferation of leafy spurge and other noxious weeds was not a problem associated with the military presence did so not because weed infestations are not a problem, but because they did not believe that military activities were responsible. As one respondent put it:

> "...As for leafy spurge, rest assured that it has been around for years, and the Shilo troops or German troops are surely not responsible for its' spread as some educated people want us to believe."

Apparently the media coverage of this issue has not had an effect on the perceptions of all local landowners.

The majority of respondents (89%) indicated they either disagreed or did not know whether damage to the Stockton and Treesbank Ferries was a problem associated with the military presence (Table 28). This is not surprising because there has been no damage to the Ferries which has been associated with the military presence (E.C. Plaetinck, Secretary Treasurer, R.M. of South Cypress, pers. comm.). This finding suggests that the majority of respondents who agreed that any problems on the list of problem items in question 4, section 2, were problems were doing so on an issue to issue basis. That is, most respondents cognizant of problems gave some thought to the issues before answering the items in question 4. Eleven (7%) respondents agreed that damage to the Ferries was a problem. These respondents likely hold such strong unfavourable attitudes toward the military that

they perceive any issue related to the military presence to be a problem. These individuals are likely to have disagreed that any benefit items listed in question 3, section 2, were benefits. This argument is supportive of the previous conclusion that there are a small number of local landowners who hold strong unfavourable attitudes toward the military presence on the Reserve.

Most respondents indicated they did not know (52%) whether ground water contamination was a problem (Table 28). It would be interesting for future studies on the effect of the media on perceptions to re-issue this question after the issue is reported through the media. Also noteworthy is the presence of the small minority (10 respondents in this case) who hold strong unfavourable attitudes toward the military presence.

Only 34 (23%) respondents perceived poaching to be a problem related to the Reserve (Table 28). From their comments it is apparent that some respondents believe the poaching problem is the result of military personnel taking wildlife on the Reserve illegally. The fact that two respondents, in response to question 5, section 2, listed hunting by military personnel to be another problem supports this explanation for perceived poaching problems.

One respondent made the following comment with respect to poaching:

> "...We do have a number of natives poaching at night. They have come from all parts of the province. In one week last fall they took out 5 bull elk and left one dead with a beeper. This was during the night hours."

It is likely that this story is known through at least part of the farming community in the study area. If this story is well known in the area it is a likely influence on the perceptions of respondents toward poaching.

There were more respondents who considered limited hunting access to be a problem than there were those who did not (Table 28). Many of the respondents who indicated they did not know if hunting access was a problem probably did so because they do not hunt. A cross-tabulation of hunting behaviour (HUNTING) and perceptions about hunting access (HUNT) indicates that respondents who perceive hunting access problems tend to be hunters (chi-square=4.47, d.f.=1, P-value=0.03).

More respondents agreed that limited access to roads near firing ranges during certain times of the year was a problem than disagreed (Table 28). In addition, a number of respondents made special mention of other problems related to roads. Two respondents indicated that heavy military traffic on local roads was a problem. One other respondent expanded on this problem by indicating that he believed the military were responsible for road deterioration. These results suggest that the military use of public roads is a problem issue for some respondents.

The majority of respondents (58%) disagreed that loss of agricultural land was a problem (Table 28). This question and the question of noise as a problem seemed to be the easiest for respondents to answer on the list in question 4. (Note the relatively small percentage (17%) of "don't know" responses (Table 28)). Many respondents commented that they disagreed that loss of land was problem because they did not feel the Reserve land had much potential for agriculture. Although two respondents specifically mentioned the loss of agricultural land as another problem associated with the military presence on the Reserve, a lost opportunity for agriculture on the Reserve does not appear to be a significant problem according to respondents. In future surveys it might be interesting to gather perceptions about whether respondents consider the military use of the Reserve to be the best use of the Reserve.

More respondents (63) disagreed than agreed (41) that depredation was a problem associated with the Military Reserve (Table 28).[18]

Table 31 lists the series of variables which were correlated to the respondent strata. Chi-square tests for independence were used for each correlation. The cross-tabulation of strata by the DEPRED variable (question 4 (1), section 2) was the only relationship for which the null

[18] Depredation was described as damage to property by wildlife originating from the Reserve on the landowner questionnaire (question 4(1), section 2).

TABLE 31

List of selected variables cross-tabulated with respondent strata

ECOACT	FERRY
ECOWESTG	GRWATER
SOCIAL	POACH
NOISE	HUNT
WILDL	ROADS
BURNS	AGLOSS
VEGTN	DEPRED[1]
LSPURGE	

[1] denotes a significant chi-square value (0.05 level)

hypothesis of independent variables could be rejected (at 0.05 level of significance) (Table 32). As can be seen in the cross-tabulation presented in Table 32, respondents from the AC stratum tended to agree more than expected (under the assumption of independence) that damage to property by wildlife originating from the Reserve was a problem, while respondents from the NAS stratum tended to agree less than expected. This can be explained by the fact that property (crop) damage by wildlife originating from the Military Reserve will be concentrated in areas of closest proximity to the Reserve.

This association between perceptions of depredation and respondent stratum is therefore an important consideration in the isolation of problem issues in the area around the Reserve. That is, the issue is important to residents owning land adjacent to the Reserve.

Respondents were asked to rank the three worst problem items from the list of twelve presented in question 4. For the purposes of analysis, the rankings are first given values: the worst problem receives a value of three (3); the second worst problem receives a value of two (2); and the third worst value receives a value of one (1). Then the frequency of each variable in question 4 in each ranking is multiplied by the value of the particular rank. For example, the variable NOISE was considered the worst problem by 17 respondents, the second worst problem by 7 respondents,

TABLE 32

Cross-tabulation of responses to question 4(1), section 2 (DEPRED variable) by respondent strata

RESPONDENT STRATUM

DEPRED VARIABLE	Adjacent	Within 3 Miles	Non-Adjacent	Row Total
Yes	10 5.7	10 9.3	21 26.0	41 40.6%
No	4 8.3	13 13.7	43 38.0	60 59.4%
Column Total	14 13.9%	23 22.8%	64 63.4%	101 100.0%

chi-square	d.f.	significance	cells with E.F.< 5
7.21	2	0.0272	NONE

and the third worst problem by 12 respondents. Therefore, the overall ranking of the variable NOISE is:

$$(17 \times 3) + (7 \times 2) + (12 \times 1) = 77$$

The overall rankings for all variables in question 4 are presented in descending order in Table 33.

The proliferation of leafy spurge and other noxious weeds was perceived to be the worst problem. Whether this is a result of the media coverage of the issue or not is not certain.

The second worst problem perceived was wildlife disturbance, which, as indicated, appears to be negatively related to the distance of the respondent's residence from the Reserve. Its importance provides further evidence that this problem issue contributes to the fact that it cannot be concluded that residents living in proximity to the Reserve are more "concerned" about military activities and their effects occurring on the Shilo Reserve.

The third worst problem perceived was that of controlled burns. It is acknowledged that the problem perceived is not only one of smoke and ashfall, but also of environmental damage and the threat of wildfires.

The fourth worst perceived problem was noise. This problem is mentioned because the difference between its rank and that of controlled burns is small. Apparently for those individuals who found the noise of military activities to be

TABLE 33

Overall rankings of problem items listed in question 4, section 2

PROBLEM ITEM	RANK SCORE
(e) LSPURGE	120
(b) WILDL	92
(c) BURNS	79
(a) NOISE	77
(l) DEPRED	47
(d) VEGTN	47
(i) HUNT	45
(k) AGLOSS	38
(h) POACH	30
(i) ROADS	30
(g) GRWATER	5
(f) FERRY	4

disturbing it was significant problem. It is likely that many respondents associated noise with noise and vibrations. The exclusion of vibration as a variable on the questionnaire is a limitation in the analysis.

A total of 31 respondents indicated other problems which they listed for question 5, section 2. A number of these have been discussed in some of the preceding sections dealing with individual problem items. Other problems which were listed by respondents are presented here. These, like the other benefits listed, should be given special attention.

The following can be classified as general problems. Three respondents indicated that unexploded shells on the Reserve constituted a threat to their safety and, presumably, that of the general public. Another three respondents indicated that environmental damage in general is a concern and a problem associated with the military activities on the Reserve. Two respondents indicated that they were worried about the possible danger from artillery fire and concerned about the presence of the German Army at Shilo. One respondent indicated that the distribution of the benefits of the military presence was inequitable because only a select few area residents realized these benefits.

The following problems stem primarily from the personal experiences of the respondent. Three respondents reported

that military personnel and vehicles had damaged their crops, and that this disregard for property on the part of military personnel was a problem. Two respondents complained that the military presence restricted the access of private airplanes to airways. No further elaboration of this problem was provided. It would seem that little can be done to increase access to airways over the Reserve, aside from decreasing the military activities on the ranges. Two other respondents indicated that restricted access to the Reserve was a problem. This may or may not be related to the road access problem. One respondent reported that he had had a problem with vandalism by military personnel. Another respondent complained that the military personnel at Shilo had a condescending attitude towards civilians.

Two other problems were listed by two respondents. One respondent indicated that grasshopper infestations were a problem associated with the military presence. The other respondent indicated that military activities were causing weather disturbances. Since little information is available on either of these phenomena, it is difficult to recommend any action to deal with them.

4.7 PERCEPTIONS RELATED TO INFORMATION

In general, respondents do not feel there is an adequate amount of information provided to the public about military activities and their effects on the Shilo Reserve. Table 34 lists the median of responses to the adequacy of the amount of information question (AMOUNT variable; question 6, section 2) to be equal to scale number "4" (mildly disagree). In addition, scale number "6" (strongly disagree) has the highest frequency (22% of respondents) of all scale numbers. One respondent living in proximity to the Reserve provided insight into some of the information inadequacies. In reference to the closure of road allowances the respondent commented:

> "...We then had to do a great deal of phoning as well as running around to regain access to our properties. This is all at our own expense. This seems to be always happening. We only find out after everything is signed and sealed..."

It should be noted that 18 (12%) respondents did not answer question 6, section 2. It is likely that these respondents did not know if there was an adequate amount of information.

The majority of respondents believed that DND had the most responsibility to inform them about the military presence on the Reserve. In Table 35 it is shown that 69 (47%) respondents believed DND was responsible for information. In addition, another 42 (28%) respondents indicated that DND

TABLE 34

Frequency distribution of responses to question 6, section 2 (AMOUNT variable)

ADEQUATE AMOUNT OF INFORMATION?

	Scale Number	Frequency	Percentage
Strongly agree	1	18	13.8%
	2	13	10.0%
	3	28	21.5%
	4	19	14.6%
	5	20	15.4%
Strongly disagree	6	32	24.6%
TOTAL		130	100.0%

Missing Cases = 18

TABLE 35

Frequency distribution of responses to question 7, section 2 (RESPINF variable)

RESPONSIBILITY TO INFORM PUBLIC?

	Frequency	Percentage
DND	69	50.4%
Other Fed. Govt. Dept.	2	1.5%
MDNR	13	9.5%
Man. Dept. of Agric.	2	1.5%
Municipal Govt.	1	0.7%
All Media Categories	1	0.7%
Newsp. and Television	2	1.5%
More than 1, incl. DND	42	30.7%
> 1, not incl. DND	5	3.6%
TOTAL	137	100.0%

Missing cases = 11

as well as other organizations were responsible for the information. Of those respondents who indicated DND as well as other organizations, 25 indicated MDNR as at least one of those other organizations. In addition, four of five respondents who indicated more than one organization, not including DND, indicated MDNR as one of the organizations. Therefore, 111 (75%) respondents indicated DND was responsible for informing landowners about military activities, while 42 (28%) respondents indicated MDNR was responsible.

Responses to question 10, section 2 (Table 36) indicate that respondents are especially interested in "information concerning any environmental damage" and "control measures being taken to lessen environmental damage". This suggests that many respondents wish to have a better understanding of the environmental effects of military activities. Perhaps the fact that they were surveyed for opinions about the Reserve increased their interest in the environmental effects of military activities. The interest in information about the leasing agreements may also be connected to the survey.

Many respondents were interested in the times when the public has access to the ranges. This information would be very useful to those landowners who must traverse portions of the Reserve.

Table 37 shows the frequency distribution of responses to the respondents' awareness of SEAC. It is apparent from

TABLE 36

Frequency distribution of responses to question 10, section 2

INFORMATION ITEM	FREQUENCY (NUMBER OF TIMES INDICATED)
FIRING	21
PUBLACC	57
HUNTSCH	45
EQUIP	24
ARTILRY	27
EVAENV	70
CONTENV	67
MONTENV	49
TIMEBURN	42
LEASAGR	51
OTHINF	4[1]

[1] Five other types of information were specified by four respondents:

1. What the expense of the military Base is to taxpayers;
2. Information concerning K.Rebizant's study of bull elk;
3. "What training Army personnel have in regard to property rights of adjacent landowners"; and
4. What responsibility the Army has accepted for policing damage by Army personnel to private property.

TABLE 37

Frequency distribution of responses to question 8, section 2 (SEAC variable)

AWARENESS OF SEAC	Frequency	Percentage
Yes	17	11.6%
No	129	88.4%
TOTAL	146	100.0%

Missing cases = 2

this Table that respondents were relatively unaware of SEAC. As suggested earlier, DND, as well as MDNR, can benefit from increasing local landowners' awareness of SEAC.

The majority of respondents felt that DND should be most responsible for compensation from any adverse effects related to the military presence on the Reserve (Table 38). Ninety-nine (67%) respondents indicated DND, and 14 (10%) indicated DND as well as other organizations should be held responsible. Therefore, 113 (76%) respondents felt that DND was most responsible for compensation. The second most frequently selected government level was MDNR.

4.8 PERCEPTIONS OF GOVERNMENT UNDERSTANDING

Respondents were asked whether their municipal government, MDNR, and DND understood their views about the military presence. Respondents indicated their beliefs on a six-point scale with "They do not understand my views at all" at the lower end of the scale and "They understand my views very well" at the upper end. The frequency distributions for the responses are shown in Table 39.

The medians for all three levels of government was scale number "3". However, respondents tended to believe that DND did not understand their views as well as MDNR, and MDNR did not understand their views as well as their municipal government (mean for DND=2.77; mean for MDNR=3.23; mean for MUNCGOV=3.39).

TABLE 38

Frequency distribution of responses to question 14, section 2 (COMPEN variable)

	Frequency	Percentage
DND	99	76.2%
Other Fed. Govt. Dept.	3	2.3%
MDNR	5	3.8%
Man. Dept. of Agric.	2	1.5%
Municipal Government	1	0.8%
Other[1]	2	1.5%
More than 1, incl. DND	14	10.8%
> 1, not incl. DND	4	3.1%
TOTAL	130	100.0%

[1] Two respondents specified other organizations responsible:

1. None. There are no adverse effects; and
2. The party causing the damage.

Missing cases = 18

TABLE 39

Frequency distribution of responses to question 11, section 2 (MUNCGOV, DND and MDNR variables)

		GOVERNMENT LEVEL		
	Scale Number	Municipal Govt.	DND	MDNR
Do not understand views at all	1	23	27	22
	2	8	23	11
	3	29	24	24
	4	25	16	28
	5	11	5	12
Understand views very well	6	17	9	9
Missing cases		35	44	42
Valid cases		113	104	106
Mean		3.39	2.77	3.23
Mode		3	1	4
Median		3	3	3

The cross-tabulation of IMPACT by MUNCGOV is presented in Table 40. This analysis indicates that the respondent's attitude toward the military influences whether or not he/she felt that the municipal government understood his/her views. Respondents with unfavourable attitudes toward the military presence tended to score the representation of the municipal government lower than expected (under the assumption of independent variables).

The null hypothesis of independent variables cannot be rejected using the chi-square test at 0.05 level of significance for the DND and MDNR variables by the IMPACT variable. The relationships between the DND variable and IMPACT and the MDNR variable and IMPACT are not as strong as the relationship between the MUNCGOV variable and IMPACT probably because the respondents' attitudes toward DND are less affected by any concerns they may have about the military presence. Respondents likely perceive that their views should be better represented by locally elected agencies rather than government agencies somewhat removed from the local situation. Schiff's (1971) definition of the difference between attitude and perceptions can be applied to this situation. Respondents likely hold attitudes about the abilities of MDNR and DND to represent their views, whereas respondents' views of the representation they receive from their locally elected officials are more like perceptions.

TABLE 40

Cross-tabulation of MUNCGOV variable by IMPACT variable

MUNCGOV VARIABLE[1]

IMPACT VARIABLE[2]	Scale # 1-2	Scale # 3-4	Scale # 5-6	Row Total
Scale # 1-2	7 9.1	14 16.7	13 8.2	34 31.5%
Scale # 3-4	10 12.6	31 23.1	6 11.3	47 43.5%
Scale # 5-6	12 7.3	8 13.3	7 6.5	27 25.0%
Column Total	29 26.9%	53 49.1%	26 24.1%	108 100.0%

chi-square	d.f.	significance	cells with E.F.< 5
14.76	4	0.0052	NONE

Number of Missing Observations = 40

[1] Scale for MUNCGOV: 1 = do not understand
6 = understand very well

[2] Scale for IMPACT: 1 = strongly agree (positive)
6 = strongly disagree

Chapter V

CONCLUSIONS AND RECOMMENDATIONS

The primary objective of this study was to explore the attitudes and perceptions of local landowners toward military activities and its effects from CFB Shilo Military Reserve. Three general hypotheses were formed to provide focus for the research.

5.1 CONCLUSIONS

In general, respondents are not concerned about military activities and its effects from the Shilo Military Reserve. In addition, the majority of respondents consider the impact of the military presence to be at least somewhat positive. The majority of respondents consider the economic benefits attributed to the military presence to be the greatest overall benefit related to the Reserve.

However, there are a minority of respondents who are very concerned about and hold strong unfavourable attitudes toward the military presence on the Reserve. As well, many respondents perceived problem issues related to the Reserve. Four major problem issues related to the military presence are apparent:

1. the proliferation of leafy spurge and other noxious weeds;
2. wildlife disturbance;
3. controlled burns; and
4. noise.

Perceptions about the proliferation of leafy spurge and other noxious weeds do not appear to depend on personal experience with the weed, or the distance from the Reserve of a spurge infestation on a respondent's property. It is hypothesized that the media coverage of the leafy spurge issue has had a significant influence on the perceptions of respondents. Perceptions of wildlife disturbance as a problem also appear to be influenced significantly by the media and public opinion. Controlled burns are considered a problem because respondents are concerned about damage to the environment by fires and because many respondents implied that the question inferred the problem of wildfires. Respondents who perceive noise to be a problem have very strong views on the issue. In addition, many respondents associated noise with noise and vibrations.

Concern about military activities and its effects from the Shilo Military Reserve varies by respondent strata. Respondents owning land adjacent to the Reserve boundary (AC stratum) are relatively more concerned about activities occurring on the Reserve than respondents owning only non-adjacent land. In addition, respondents owning land adjacent

to the Reserve tend to hold more unfavourable attitudes toward the military presence than respondents owning only non-adjacent land. It cannot be concluded that the distance of a respondent's residence from the Reserve influences the respondent's attitude toward the military activities and its effects on the Reserve. This conclusion cannot be made because other factors, such as the respondent's proximity to a line between the City of Brandon and the Shilo townsite and/or proximity to intensively used military training areas, and whether or not the respondent resides on his/her land nearest to the border of the Reserve, also seem to contribute to the respondent's attitudes and perceptions.

It is hypothesized that the nature of some of the perceived problems associated with the Reserve varies with the distance of the respondent's residence from the Reserve. Respondents living in proximity to the Reserve perceive certain problems (eg. depredation) with greater frequency than more distantly situated respondents. Alternatively, more distantly situated respondents perceive certain problems (eg. wildlife disturbance) with greater frequency than respondents in closer proximity to the Reserve. It is hypothesized that differences in perceptions of problems are influenced by the respondent's personal experience with and media coverage of the issue.

It cannot be concluded that a respondent's awareness of the leasing agreement has an influence on that individual's

attitude toward the military activities and its effects. This hypothesis should be altered in such a way that the influence of the respondents' awareness of specific clauses in the lease on attitudes toward the military is tested.

The majority of respondents are unaware of SEAC. However, it is expected that if respondents are not strongly predisposed to an unfavourable attitude, respondents who become aware of the existence of SEAC will tend to hold more favourable attitudes toward the military presence on the Shilo Reserve.

Respondents from the R.M. of South Cypress tend to be affected to a greater extent by the negative aspects of the military activities than respondents from the R.M. of Cornwallis. Respondents from the R.M. of South Cypress also perceive more problems associated with the military presence than do respondents from the R.M. of Cornwallis. The differences in perceptions are hypothesized to be related to respondents' relative proximity to a line between the Shilo townsite and the City of Brandon and/or relative proximity to intensively used training areas.

In general, respondents do not believe that there is an adequate amount of information provided to the public about military activities and its effects from the Shilo Reserve. Respondents appear to be most interested in information concerning the environmental impact of the military activities

on the Reserve, the times when the public has access to the ranges, and the leasing agreement between DND and MDNR. Times of access would be most useful to those landowners who must traverse portions of the Reserve.

Respondents do not tend to take their concerns about the military activities and its effects directly to DND. Instead, respondents rely on their local government representatives to deal with their concerns. In addition, there appears to be a positive relationship between a respondent's "concern" about military activities and his/her perception of local government understanding. That is, respondents with "negative" attitudes toward the military presence do not believe that their local government officials understand their views very well. This relationship is not apparent for respondents' perceptions of how well either MDNR or DND understand their views. However, the majority of respondents believe that DND is the agency most responsible for the activities and its effects.

Generally, the demographic and land-use/farm characteristics measured by the survey do not appear to be related to differences in attitudes and perceptions. However, it is difficult to be confident about the associations, or lack thereof, because of the small sample size.

Based upon the response rate, the apparent nature of non-response, and the nature of the conclusions drawn from the

data, respondents appear to be representative of local landowners (the target population).

5.2 RECOMMENDATIONS

A number of problem issues are of concern to landowners in the vicinity of the Reserve. Both MDNR and DND could provide a better service to the public by dealing with the concerns that exist.

Leafy Spurge and Other Noxious Weeds and Wildlife Disturbance

Perceptions of the proliferation of leafy spurge and other noxious weeds and wildlife disturbance can be addressed effectively by publicizing the existence, function, and activities of SEAC. It is expected that as respondents become more familiar with SEAC, a more favourable attitude toward the military presence will be fostered. The time and money needed for general public relations could be more effectively used for this purpose.

The information could be advertised in local papers, or delivered as press releases. The information should contain unbiased accounts of studies being undertaken and a summary of the results of these studies when completed.

DND should continue to attempt to control the spread of leafy spurge with the most effective control methods available. DND should also inform local landowners of what steps they are taking to control the spread of weeds. DND should continue working in conjunction with the surrounding rural municipalities in these respects.

Controlled Burns

The effects of controlled burns on the perceptions of local landowners can be mitigated to an extent by informing local residents about the scheduling of fires and the reasons for their use. This information should be provided before any fires are set.

DND should also consider conducting controlled burns on a schedule which more closely conforms to the occurrence of fire in natural ecosystems. For example, controlled burns might be set every two to seven years. Not only would such a schedule benefit some wildlife species, it would also mitigate public apprehension about the effects of fire. Alternatively, rather than conducting large controlled burns every year, the military should consider conducting a series of small burns in such a way that the area to be burned is

covered over a number of years. That is, designated areas would be burned on a annual rotational basis. This system would not only generate public relation benefits, but would probably also have a positive ecological impact.

Research into the most effective system of controlled burns is, therefore, necessary. The most effective system would minimize the threat of wildfires, the potential for proliferation of agriculturally harmful weed species, and the damage to the natural environment. Such a system would then maximize public approval.

Depredation

It is recommended that research into the most cost-effective method of controlling crop depredation be initiated. As the numbers of elk increase on the Reserve, it is expected that depredation will become a more serious problem. This research should be carried out through SEAC and MDNR.

A serious evaluation of the effectiveness of compensation programs for property depredation by wildlife should be undertaken. The results of this study suggest that requests for compensation do not reflect the depredation occurring.

Additional Information Requirements

Some of the previous recommendations should begin to meet the perceived information inadequacies about military activities. However, it is also recommended that DND, MDNR, and the local government agencies discuss the information needs of the local residents, and develop a system for getting this information to them.

For example, access to public roads in and around the Reserve is important to residents. DND should be able to provide schedules of when these roads are not accessible, perhaps on a weekly or monthly basis. This information could be provided to the Reeve of a municipality or delivered by mail to local residents who have voiced an interest in the information. Alternatively, these residents might be provided with a phone number to call for this information.

Specific problems perceived by landowners generally involved poor relations with military personnel. Therefore, it is recommended that military personnel be advised to respect private property rights and the rights of civilians.

Future Surveys in Area

Perceptions can, for a variety of reasons, change through time. Therefore, future surveys in the area can have a role to play in planning and policy making. The remaining recommendations relate to future survey research in the Shilo area.

This survey has generated some hypotheses which are relevant to the attitudes and perceptions of local landowners. It is recommended that these hypotheses be tested in future social survey research in the area.

1. Respondents' perceptions are affected by their personal experience with an issue and any related media coverage.

   This hypothesis is particularly relevant to the issues of wildlife disturbance and the proliferation of leafy spurge. As mentioned in Chapter IV, this hypothesis might be tested for the issue of ground-water contamination.

2. Respondents in proximity to a line between the Shilo townsite and the City of Brandon hold more favourable attitudes toward the military presence than do respondents living in proximity to the Reserve, but more distant from the Shilo-Brandon line.

3. Respondents in proximity to intensively used training areas (battleruns) hold less favourable attitudes toward the military presence than do respondents living further from these areas.

It is recommended that future survey research in the area be conducted prior to the date of extension of the leasing agreement (Dec, 31, 1993). It is also recommended that at that time a census of local landowners be surveyed. The additional information generated justify the additional cost associated with the larger survey.

It is recommended that future surveys gather the following information, which was not adequately gathered in this survey:

1. perceptions of whether of not respondents consider the military use of the Reserve to be the <u>best</u> use of the Reserve;

2. perceptions of the "cultural" interaction of West German soldiers with Canadians;

3. perceptions of the "amenities" at CFB Shilo;

4. perceptions of "vibrations" from military activity; and

5. perceptions of "wildfires" associated with the Reserve.

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Appendix A

LOCAL LANDOWNER QUESTIONNAIRE AND COVERING LETTERS

THE UNIVERSITY OF MANITOBA

NATURAL RESOURCES INSTITUTE

Winnipeg, Manitoba
Canada R3T 2N2

(204) 474-8373

August 10, 1984

Dear Landowner:

I am a Masters student at the University of Manitoba conducting a study of residents living near the Shilo Military Reserve. This study is one part of the requirements for my degree. I would like to find out what opinions you have about the presence of this military reserve and the activities carried out there. As a landowner, you can provide valuable insights as to the effects of the military activities.

I would greatly appreciate it if you would complete and return the questionnaire in the envelope provided as soon as possible. The questionnaire has been designed so that it requires no more than about 15 minutes to complete. Please be assured that the information you provide will be strictly confidential. You do not have to put your name on the questionnaire.

Please take this opportunity to express your opinions. They will be used to assist in future planning for this unique area of Manitoba.

Sincerely,

Mark Wonneck
Graduate Student

THE UNIVERSITY OF MANITOBA

NATURAL RESOURCES INSTITUTE

Winnipeg, Manitoba
Canada R3T 2N2
(204) 474-8373

September 24, 1984

Dear Landowner:

Approximately six weeks ago I mailed you a questionnaire. The purpose of the questionnaire is to determine what opinions you have about the Shilo Military Reserve and the military activities carried out there.

I am sending this letter to encourage you to complete and return the questionnaire. I realize for many of you this is a very busy time of the year, however, I hope you will take the time to express your opinions and have a say in decisions concerning the area in and around the Shilo Reserve.

Many questionnaires have been returned, but I would greatly appreciate it if I could include your views in the study. For those of you who may have misplaced or lost the first questionnaire, I have included another copy.

If you have already completed the questionnaire and mailed it, thank you very much.

Sincerely,

Mark Wonneck

Mark Wonneck
Graduate Student

Landowner Questionnaire

SECTION 1

I WOULD LIKE TO START OFF BY ASKING YOU SOME GENERAL QUESTIONS ABOUT YOUR LAND HOLDINGS.

1. In which municipality do you live?

   _____

2. For how many years have you been a landowner in the municipalities of either Cornwallis, Oakland, North Cypress, or South Cypress? _____

3. LAND USE.
   Which of the following best describes how you use your land holdings in the vicinity of the Shilo Military Reserve? (You may indicate more than one, if necessary).
   (Please use a check mark).

   ___ cereal crop farm
   ___ cash crop farm
   ___ dairy operation
   ___ poultry operation
   ___ pork operation
   ___ mixed farm
   ___ cattle ranch
   ___ horse ranch
   ___ rent land out
   ___ do not use land
   ___ other (please specify)
   _____

4. Number of acres owned and/or rented? (Please fill in the appropriate spaces).

	Number of acres owned	Number of acres rented
cultivated land	_____	_____
forage land	_____	_____
other improved land	_____	_____
woodland	_____	_____
native hay and pasture	_____	_____
other unimproved land	_____	_____

5. About how far in a straight line is your residence from the nearest border of the Military Reserve? _____mile(s)

6. Has the military presence or activities had a direct effect on you or your property?
___ yes ___ no

a) If yes, in what way? _____
_____

7. Has any of your land been infested by leafy spurge?
___ yes ___ no ___ don't know

a) If yes, about how far in a straight line is the nearest border of the Reserve from the infestation? _____mile(s)

SECTION 2
NOW I WOULD LIKE TO FIND OUT SOME OF YOUR OPINIONS ABOUT THE SHILO MILITARY RESERVE.

1. How would you describe your overall feelings about the activities occurring on the Military Reserve? (Please indicate by circling one number on the scale below).

of absolutely no concern					of great concern
1	2	3	4	5	6

2. Please indicate the extent to which you agree or disagree with the following statement:

"The overall impact of the military presence on the Shilo Reserve is very positive."

strongly agree					strongly disagree
1	2	3	4	5	6

3. Different people see different benefits and problems related to the military presence on the Shilo Reserve. I would like to get your opinions about some of these benefits and problems.

Please indicate whether or not you think the following are benefits of the military presence. (Place a check mark in the space under either yes, no, or don't know).

	yes	no	don't know	
(a)	___	___	___	economic activity occurring outside the Reserve because of the military presence
(b)	___	___	___	economic returns generated off the Reserve by the influx of West German Army personnel
(c)	___	___	___	social interaction of West German soldiers with Canadians

a) Which of the above do you think is of the greatest overall benefit? (Indicate which letter, a, b, or c). _____

4. Next is a list of what some people consider to be problems associated with the military presence on the Shilo Reserve. Do you think that these are problems? (Check either yes, no, or don't know for each of the following).

	yes	no	don't know	
(a)	___	___	___	noise
(b)	___	___	___	wildlife disturbance
(c)	___	___	___	controlled burns
(d)	___	___	___	vegetation trampling on the Reserve
(e)	___	___	___	proliferation of leafy spurge and other noxious weeds
(f)	___	___	___	damage to Stockton and Treesbank Ferries
(g)	___	___	___	ground water contamination
(h)	___	___	___	poaching problems
(i)	___	___	___	limited hunting access
(j)	___	___	___	limited access to roads near firing ranges during certain times of the year

	yes	no	don't know	(question 4 continued)
(k)	___	___	___	loss of agricultural land to Reserve
(l)	___	___	___	damage to property by wildlife originating from the Reserve

a) Now list up to three of the above that you consider to be the worst problems. (Place the appropriate letter in the space provided).

___ The worst problem
___ The second worst problem
___ The third worst problem

5. If you can think of other benefits or problems related to the Shilo Reserve, please list them below

BENEFITS:_____
_____

PROBLEMS:_____
_____

6. Please indicate the extent to which you agree or disagree with the following statement:

"There is an adequate amount of information provided to the public about military activities and their effects on the Shilo Reserve."

strongly agree					strongly disagree
1	2	3	4	5	6

7. Which of the following organizations do you think has the <u>most</u> responsibility to inform you about the military activity on the Reserve? (check one).

___ Department of National Defence
___ Other Federal Government Departments
(please specify)
_____

___ Manitoba Department of Natural Resources
___ Manitoba Department of Agriculture
___ Other Provincial Government Departments
(please specify)
_____

___ Municipal Government
___ Media (please indicate which form(s))
    ___ newspapers
    ___ radio
    ___ television
    ___ other (please specify) _____
    _____
___ Other (please specify)
_____

8. Are you aware of the existence of the Shilo Environmental Advisory Committee (S.E.A.C.)?
___ yes ___ no

9. Are you aware of the leasing agreement regarding the Shilo Military Reserve between the Department of National Defence and the Manitoba Department of Natural Resources?

___ yes, completely ___ yes, to some extent ___ no

10. Which of the following types of information would you like to be available to you? (check as many as apply).
___ Firing schedules
___ Times when the public has access to the ranges
___ Hunting schedules
___ Types of equipment being used by the military
___ Types of artillery being used by the military
___ Evaluation of any environmental damage
___ Information about the control measures being taken to lessen any environmental damage
___ The results of environmental damage monitoring programs
___ Timing of control burns
___ Leasing agreements between the Department of National Defence and the Manitoba Department of Natural Resources
___ Other (Please specify)
_____
_____
_____

11. How well do you feel each of the following government agencies represents or understands <u>your</u> <u>views</u> about the military presence: (please indicate by circling one number in each of the scales below)

a) Municipal government?

They do not understand my views at all					They understand my views very well
1	2	3	4	5	6

b) Department of National Defence?

They do not understand my views at all					They understand my views very well
1	2	3	4	5	6

c) Manitoba Department of Natural Resources?

They do not understand my views at all					They understand my views very well
1	2	3	4	5	6

12. Have you raised any of your concerns about the military's effects with any elected officials? (Please specify which government level).

___ yes
- ___ Federal
- ___ Provincial
- ___ Municipal

___ no
___ other (please explain)

_____
_____

13. Have you had any direct contact with any of the following military personnel? (Check either yes or no).

Range Control personnel
___ yes ___ no
Administrative personnel at CFB Shilo
___ yes ___ no
Other military personnel (please specify)
___ yes ___ no
_____

14. Which government level do you think should be <u>most</u> responsible for compensation from any adverse effects related to the military presence on the Reserve? (check one).

___ Department of National Defence
___ Other Federal Government Departments
(please specify)

_____

___ Manitoba Department of Natural Resources
___ Manitoba Department of Agriculture
___ Other Provincial Government Departments
(please specify)

_____

___ Municipal Government
___ Other (please specify)

_____

_____

SECTION 3

FINALLY, I WOULD LIKE TO ASK YOU SOME QUESTIONS ABOUT YOURSELF SO THAT I CAN MAKE GROUP COMPARISONS. I ASSURE YOU THAT ALL ANSWERS ON THIS QUESTIONNAIRE WILL BE STRICTLY CONFIDENTIAL. DO NOT PUT YOUR NAME ON THE QUESTIONNAIRE.

1. What is your age?

___ 24 years or younger
___ 25 to 34
___ 35 to 44
___ 45 to 54
___ 55 to 64
___ 65 or over

2. Please indicate your sex.

___ male ___ female

3. How many children or dependents do you have and what are their ages in years?

Number of children or dependents _____
Ages (in years) ___,___,___,___,___,___,___,___

4. What level of education have you completed?

___ Grade school
___ High school
___ Technical or Trade school
___ University

5. Which wildlife species do you normally hunt? (Please indicate).

___ None
___ Elk
___ White-tailed deer
___ Other (please specify)
___ Waterfowl
___ Upland game bird
___ Moose

Thank you for filling out this questionnaire. If you have any comments about the questionnaire, the survey or the topic, please feel free to make them below.

Appendix B

LOCAL GOVERNMENT QUESTIONNAIRE

Local Government Questionnaire

1. How would you describe the overall feelings of residents living in proximity to CFB Shilo about the activities occurring on the Military Reserve?

of absolutely no concern					of great concern
1	2	3	4	5	6

2. How would you describe the overall feelings of the municipality(town) as a whole about the military activities occurring on the Military Reserve?

of absolutely no concern					of great concern
1	2	3	4	5	6

3. Please indicate the extent to which you agree or disagree with the following statement:

"The overall impact of the military presence on the Shilo Reserve is very positive."

strongly agree					strongly disagree
1	2	3	4	5	6

4. Different people see different benefits and problems related to the military presence on the Shilo Reserve. I would like to get your opinions about some of these benefits and problems.

Please indicate whether or not you think the following are benefits of the military presence. (Place a check mark in the space under either yes, no, or don't know).

	yes	no	don't know	
(a)	___	___	___	economic activity occurring outside the Reserve because of the military presence
(b)	___	___	___	economic returns generated off the Reserve by the influx of West German Army personnel

(c) ___ ___ ___ social interaction of West German soldiers with Canadians

a) Which of the above do you think is of the greatest overall benefit? (Indicate which letter, a, b, or c). _____

5. Next is a list of what some people consider to be problems associated with the military presence on the Shilo Reserve. Do you think that these are problems? (Check either yes, no, or don't know for each of the following).

	yes	no	don't know	
(a)	___	___	___	noise
(b)	___	___	___	wildlife disturbance
(c)	___	___	___	controlled burns
(d)	___	___	___	vegetation trampling on the Reserve
(e)	___	___	___	proliferation of leafy spurge and other noxious weeds
(f)	___	___	___	damage to Stockton and Treesbank Ferries
(g)	___	___	___	ground water contamination
(h)	___	___	___	poaching problems
(i)	___	___	___	limited hunting access
(j)	___	___	___	limited access to roads near firing ranges during certain times of the year
(k)	___	___	___	loss of agricultural land to Reserve
(l)	___	___	___	damage to property by wildlife originating from the Reserve

a) Now list up to three of the above that you consider to be the worst problems. (Place the appropriate letter in the space provided).

___ The worst problem
___ The second worst problem
___ The third worst problem

6. If you can think of other benefits or problems related to the Shilo Reserve, please list them below.

BENEFITS:_____
_____

PROBLEMS:_____
_____

7. How do you think local landowners would respond to the previous question? _____
_____
_____
_____
_____
_____

8. Please indicate the extent to which you agree or disagree with the following statement:

"There is an adequate amount of information provided to the public about military activities and their effects on the Shilo Reserve."

strongly agree					strongly disagree
1	2	3	4	5	6

9. How do you think local landowners would answer the previous question?

strongly agree					strongly disagree
1	2	3	4	5	6

10. Which of the following organizations do you think has the <u>most</u> responsibility to inform local residents about the military activity on the Reserve? (check one).

___ Department of National Defence
___ Other Federal Government Departments (please specify)
_____
___ Manitoba Department of Natural Resources
___ Manitoba Department of Agricultural

___ Other Provincial Government Departments
(please specify)

_____

___ Municipal Government
___ Media (Please indicate which form(s))
___ newspapers
___ radio
___ television
___ other (please specify)

_____

_____

11. Which of the following organizations has the most responsibility to inform you about the military activity on the Reserve? (check one).

___ Department of National Defence
___ Other Federal Government Departments
(please specify)

_____

___ Manitoba Department of Natural Resources
___ Manitoba Department of Agriculture
___ Other Provincial Governments Departments
(please specify)

_____

___ Media (Please indicate which form(s))
___ newspapers
___ radio
___ television
___ other (please specify)

_____

___ other (please specify) _____

_____

12. Are you aware of the existence of the Shilo Environmental Advisory Committee (SEAC)?

___ yes ___ no

13. Are you aware of the leasing agreement regarding the Shilo Military Reserve between the Department of National Defence and the Manitoba Department of Natural Resources?

___ yes, completely ___ yes, to some extent ___ no

14. How well do you feel each of the following government agencies represents or understands local landowners views about the military presence? (please indicate by circling one number in each of the scales below).

a) Municipal Government?

do not understand at all					understand very well
1	2	3	4	5	6

Explanations _____

_____

b) Provincial Government?

do not understand at all					understand very well
1	2	3	4	5	6

Explanations

_____

_____

c) Federal Government?

do not understand at all					understand very well
1	2	3	4	5	6

Explanations

_____

_____

15. What do you think the landowner's perceptions are in this respect?

_____

_____

_____

_____

_____

16. What is the nature of the communication between your municipality (town) and the administration at CFB Shilo? (Is it regular with some particular format? Is the communication adequate? etc.).

_____

_____

_____

_____

_____

_____

17. Which government level do you think should be most responsible for compensation from any adverse effects related to the military presence on the Reserve?

___ Department of National Defence
___ Other Federal Government Departments (please specify)

_____

___ Manitoba Department of Natural Resources
___ Manitoba Department of Agriculture
___ Other Provincial Government Departments (please specify)

_____

___ Municipal Government
___ other (please specify) _____

_____

18. Please add any additional comments about the questionnaire, the survey, or about the Shilo Military Reserve in general.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Appendix C

DOCUMENTATION OF RETURNED, UNCOMPLETED QUESTIONNAIRES

Respondent #18

Filled out one before and mailed it in. That is, a repeated address.

Respondent #293

Moved.

Respondent #167

Moved.

Respondent #75

Moved.

Respondent #199

Moved.

Respondent #112

Returned by post for reason "unknown".

Respondent #289

Picked up from respondent's home. Respondent deceased. Respondent's widow did not want to fill out the questionnaire because she said she did not know anything about the topic.

Respondent #24

Moved.

Respondent #265

Dear Mark. Shilo Military Reserve has had little (if any) effect on my life or activities for the past 28 years. (signed by respondent)

Respondent #unknown

(Only covering letter was returned).

Dear Sir or Madam:

I am totally unqualified to answer your questions as I have literally no connection with the Shilo Reserve although I live within ten miles of their border. I am not a hunter so I have no need or desire to explore that territory and as it stands now I have never felt infringed upon by their presence or threatened in any way. The river flows between me and the reserve and seems to effectively cut me off from that area.

Respondent #185

We have already completed the prior form and sent it to you, so you have our views.

Respondent #136

Respondent deceased.

Respondent #unknown (perhaps 209)

Your questions are too personal. We are a very old couple and do not wish to be harassed.

Respondent #246

MARK WONNECK:

Dear Sir;

We live 12 miles south west of Shilo, as the crow flies, in the Oakland Muncipality.

As far as we know, we have had no problems in regards to our land, or wildlife, because of Camp Shilo.

The only thing, that makes us realize we live near an army camp, we occasionally hear the booming of the guns, and see the flares at night. And again, we occasionally see the army boys in Brandon.

Our boys have occasionally gone to play golf, curl, and attend their "October Fest".

As you will notice everything is "occasionally".

That's all the effect that Camp Shilo has on us. (Signed by respondent).

Respondent #189

We do not live on this land so we can not answer your questions. (signed by respondent).

Respondent #61

Respondent deceased.

Respondent #191

We do not live in Muncipality connected with Shilo, so therefore can't answer questions. They are a self-contained base, almost like another community, where organizations and clubs patronize one another. Their E.M.O. operation comes to areas of need when situation arises.

Respondent #2

Dear Mark:

I am sorry to have to return your questionnaire unanswered. The reason being that I am a widow owning only 14 acres in the area you specify and consequently not in a position to have an opinion that matters a great deal. (signed by respondent).

Respondent #132

My son who owned this land never lived there and sold the farm to people from Switzerland. They do not speak very good English so I felt I should not pass this on to them. My son lives in Ontario now and when he phoned me I told him about this letter so he asked me to open it so I will return it to you. (signed by respondent's mother).

Respondent #154

Sorry I cannot answer your questions. I do not live on my land holdings. It is rented to (someone else).

Respondent #95

Dear Sir:

In answer to your questions I do not farm any more. I am retired but have been hospitalized for most of last 15 months. I have been here since 1950 and have no complaints regarding military base at Shilo. It is all waste land and is a good place for a military base. As far as I am concerned it has never been a concern to farmers. I would not like to see it moved onto good farmland. Hope this is of some help to you. (signed by respondent).

Respondent #4

Respondent deceased.

Appendix D

ADDITIONAL COMMENTS BY RESPONDENTS

ADDITIONAL COMMENTS BY RESPONDENTS

Respondent 004

My biggest concern is for the wildlife and the environment. Although the activities at Shilo do not affect me I am concerned about the deer, elk and other wild creatures. I am also concerned about the fact that bears seem to be making appearances in settled areas. Perhaps they have been driven out of their natural surroundings to more inhabited areas.

Respondent 009

The only comment I would like to make is that I feel the firing range is too close to Wawanesa, and the noise isn't really a problem. It would be appreciated if we did now when they would be firing (Practising). Sorry we're so late sending it back but we've been busy.

Respondent 010

We live in Oakland. The 1/2 section we farm is on the border of Oakland and S. Cypress. Shilo does not affect me in any way. I feel the questions here do not apply to us and for me to answer most of them would be untruthful. (Signed by respondent).

Respondent 011

I am sorry my questionnaire will not be helpful to you. That is why I did not return the first one.

I will add that I have always been very supportive of the Military, wherever situated in Canada. Their presence is very necessary. They do a fine job of maintaining authority over personnel, and in keeping equipment and holdings in good order (considering the financial support they receive).

Respondent 019

s.2 q.4(k)

doubtful land is much good for anything as very sandy.

Respondent 020

The military camp at Shilo has very little effect on us here on the farm. Any benefits in an economic sense would be felt by Brandon. Any problems would be felt by residents of the immediate area surrounding Shilo.

As mentioned in this questionnaire there is concern for the effect of the very heavy artillery fire on our brick house, the windows of which rattle quite severely during the firing.

Respondent 029

s.2 q.10(other)

They should be NONE of control burning or any other burning

Respondent 030

The bombings at the base are a sore point with many of the local residents (landowners) however the landowners are over-ruled by the local merchants because the merchants value the commerce they enjoy with army personnel. Nevertheless the landowners pay tax on large land base while merchants etc. pay very little. As a result the landowner feels his rights are eroded by townspeople who have no real concern or care for the effects the base has on the environment (wildlife, agriculture, quality of life). Many rural residents are simply resigned to the fact they can do nothing because "Big Government" has no real concern for the individual - or - because they are too narrow minded to consider food production (primary producers) at least as important as local trade (secondary profiteers).

Respondent 032

It is very difficult to complete any business transactions due to the constant changing of authorized personnel. They are trained to think only as military men making military maneuvers.

They cannot understand the thinking of a normal farming citizen.

Respondent 035

s.2 q.4a

No effect of any above questions. Shilo is situated in the best possible place in the country (i.e., sandy soil, poor pasture, poor crop land.

Respondent 036

Shilo Military does not affect me in any way whatever - We hear the guns all the time, and they even rattle the windows, etc. But Thank God they are there - should be some of them in case we need our boys to protect us some time. They have been part of our environment for almost a century. As for leafy spurge, rest assured that it has been around for years, and the Shilo troops or German troops are surely not responsible for its spread as some educated people want us to believe. Those of us who live with weeds, wildlife, etc. definitely know better. (Signed by respondent).

Respondent 037

The shooting is very disturbing at most times, especially in the P.M. Our house vibrates, windows are shook loose etc.

Respondent 038

I think the questions are very leading. I do not believe military is the answer, but it seems to be the only way at this time.

As for the location, I think no better place could have been chosen. The wildlife in the area has thrived and has adapted to the presence of the military.

As for the environment, there is far less damage done there than in and near cities. I think there is more concern for wildlife and vegetation at Shilo than in the average community in Manitoba! (signed by respondent).

Respondent 040

No problems. The Military cooperate very well and are a benefit to the whole district.

Respondent 043

Very good survey, thanks for thinking of the concerns of the people living near the military Base.

Respondent 045

Dear Mr. Wonneck.

Re: Shilo Military Reserve,

I practise law in the City of Brandon and therefore I am of the opinion that I am now somewhat removed from the situation, I would say that I was quite close to it formerly. My actions, notwithstanding to the contrary I am very interested in the situation.

I would be very interested to receive information pertaining to your findings and to the results of your study.

The subject land is the E1/2 of 23-10-17. I do not have any direct knowledge of the present situation with respect to the situation concerning leafy spurge.

May I express my best wishes for your success. (Signed by respondent).

My closest association with the above land was when I helped to work it from the thirties, through the forties and into the fifties. Much of this work was done at night.

Comments continued

It is good that knowledge is being ascertained because only the facts will make it possible to make "the right decisions" and to monitor accordingly.

Respondent 046

I feel that the "supposed" economic benefits that are generated by the military presence at Shilo is greatly outweighed by the problems created by their presence.

I feel that it is ludicrous for any human-being to train and hone their skills in the arts of destroying other humanbeings as well as damaging the environment.

I feel that to speak out on this matter one would almost be branded as a traitor to his country and their allies.

Dealing with the military by an individual could be paralleled with a mouse maneuvering and squeaking amongst a herd of elephants.

I have a question for you! If this questionnaire is strictly confidential why is this questionnaire numbered?

Respondent 049

Dear Mark:

The few acres that I own is rented to a farmer from Brandon and I have only seen the land for a brief 1 hour in 1982.

I have tried to answer the questions as best as possible to help you with your survey. (Signed by respondent).
P.S. - My only knowledge of Shilo is what my Grandmother told me when we visited her when I was much younger. (1955-62).

Respondent 055

No direct contact with the Military so unable to give positive answers on several questions.

Respondent 058

I live in Brandon and rent the pasture and I am not inconvenienced at all by the German Army. I feel that they are a valuable bonus to the economics of the Brandon city and district.

Respondent 061

The Military base of Shilo lies in 2 municipalities, the buildings lie in North Cypress. They receive the bulk of taxes. Whereas all the range land lies in South Cypress, for which the R.M. of S.C. only receives $17,000 in lieu of taxes. The councillors feel this in unfair. So much so that they are reluctant to make improvements North of the river. We have been having a real hassle with the Ferry at Stockton and we have been told that because they are not receiving enough tax money from North of the river, we have to take whatever is dished out.

The municipality does gear a toll for the hunters for crossing the Ferry, and because there may or may not be hunters crossing at night, they have legislated a toll for residents as well at night in anticipation.

We do have a number of natives poaching at night. They have come from all parts of the province. In one week last fall they took out 5 bull elk and left one dead with a beeper. This was during night hours.

Although the military generate monies in Shilo and Brandon we do not benefit from NATO forces directly. They do cover our home with dust when they are driving down to Stockton Ferry during their recreation.

We do feel that we should be kept aware of what negotiations are being made when they are signing contracts for rental. This past contract was signed by two levels of government, only to discover that all the road allowances had been turned over to German forces. As we have land from Stockton Ferry to Park, all along the river we were greatly concerned.

This was also to keep <u>all</u> general public away, this included hunters as well. We then had to do a great deal of phoning as well as running around to regain access to our properties. This is all at our own expense. This seems to always be happening. We only find out after everything is signed and sealed. This should not happen in Canada. There should be a watch dog somewhere, the politicians should not sell our birthright for a mess of potage. Money speaks louder than words.

Hope this gives you an insight. If you have any questions you can phone us for further information (phone number)
Thanking you.

<u>Respondent 062</u>

I don't feel we were able to answer your questions very fully but we know practically nothing about the military life at or around Shilo.

Good luck in your study of this area.

<u>Respondent 063</u>

Shilo are is very poor for any type of farming, even with expensive irrigation systems, sparse vegetation on ranges - Any land good for farming - was under cultivation - years before Shilo ranges were used for army training - The range area is of no value for farming - It's only value is for army ranges - we have travelled them and know them well. (For future questionnaires to farmers - I suggest - more direct - less complicated questions - am sure you will have better results). (Signed by respondent).

Respondent 065

We have no complaints about the military reserve except we don't like to see the area (burnt) denuded of practically all bush especially spruce trees.

Respondent 066

Very interesting survey. Shilo has always been there since I can remember. It's a fact of life I hardly think of because I am so used to its presence. I hope this helps you in some way. Good Luck.

Respondent 069

Took longer than 15 minutes. Leafy spurge is the biggest problem that should be looked after.

Respondent 070

I consider your topic and questions of very little interest.

Respondent 073

Leafy spurge was prevalent in the area before military activities began on the Reserve. Although it is a serious problem there, it is not being made any worse by the army presence; certainly not any more than by negligent farmers in the areas adjacent to the Reserve.

Deployment Area 8 has, until the present, been inaccessible and relatively unused. Rumours indicate the possibility of an access road from other range areas over Epinette Creek to Area 8. In my opinion, this area should be left inaccessible from the ranges and turned over to the Manitoba Department of Natural Resources for maintenance as a park area.

Respondent 076

If problems do exist I'm not aware of them. The military Base and personnel certainly have caused me no problem, whether it's because I'm some distance away from them or what I don't know.

Respondent 080

1. I don't feel that the military reserve has much agricultural potential.
2. The leafy spurge is more of a problem for us on the west side of the river than the east, and this is due to crown lands, that the spurge is not being controlled on, even though it has been brought to their attention.

Respondent 082

s.2 q.10(other)

The Shilo base is located on sandy waste land. I am pleased to see the land used constructively.

Respondent 086

Please do not send questionnaires out during harvest season. I think you will find you will not get a accurate evaluation because it was probably done in a hurry and was not given much thought. Try January.

Respondent 087

Question 7 regarding infestation of Leafy Spurge. I feel the flooding of the Souris and Assiniboine rivers are responsible for the infestation of spurge on my property.

During the summer months, on many occasions we see smoke from fires on the Shilo ranges and are concerned as to their effect on the fragile ecology there.

In regard to wildlife in our area, bordering Shilo range, there seems to be plentiful number of deer, elk, coyote, etc. I welcome the opportunity to fill in this questionnaire, as a hunter and conservationist my concern would be to maintain this area's rich and diverse wildlife habitat.

Respondent 089

Base is not being fully utilized. Please send copy of results.

Respondent 093

Harvest time is much too busy for questionnaires. Sorry to be late.

Respondent 098

The noise is so bad that there are nights when we get no sleep at all.

The bomb and shell shock is so strong that the plaster in the house is cracked the pictures jump on the wall, the doors open and the windows rattle.

The noise also make the cattle very restless.

Respondent 101

s.2 q.12(other)

Concerned about elk hunting by non Canadian, non-resident hunters.

Comments continued

As I feel war or other violent methods are unacceptable methods of solving world conflicts, I am opposed to the presence of military action at CFB Shilo.

The present military reserve would or could be used for pasture land, recreational area, wildlife habitation, if the present activities were discontinued.

Respondent 102

s.2 q.1

We should be training our own troops or none at all.

s.2 q.2

Why train foreign troops?

s.2 q.3a

In my opinion there is no overall benefit to training foreign troops.

Comments continued

A Military reserve should be used to train our own troops. Why ruin our countryside to train foreign troops. Does any other country allow this? I think not.

Respondent 104

The river is between us and the reserve so we have never had any direct contact, "good or bad". We do hear the tanks running, the shelling etc. but have grown used to this. The vibrations of exploding shells can be felt quite plainly. I just hope they keep them aimed in the right direction. I am concerned at times by fires I see over there as the the land needs all the vegetation it can get.

Respondent 107

The Shilo Reserve area is quite a distance from our home and actually does not effect our way of life, so the questions are thought provoking as some of them we haven't even considered before and it's a bit difficult to state an opinion on something that does not effect your daily life directly.

Respondent 108

Other than hearing the distant boom from the cannons I'd never know that a military base was near.

Respondent 111

Dear Sir:

I would like to apologize for not fully completing the questionnaire.

Being of Czechoslovak origin I feel it isn't any of my business to answer these questions because I don't feel I'm qualified or know enough about it. (Signed by respondent).
P.S. If it would be possible I would like to meet you in person and have a friendly discussion about it.

Respondent 117

This year I got a license for the 1st time ever to hunt elk. It was taken in self-defence to rid my crops of elk.

Respondent 125

Too much noise from bombing or shooting on Sunday mornings. Will be quiet during the week but most Sunday mornings (early) it is so loud the house vibrates. I believe this should not be carried on on Sundays.

Respondent 128

(Signed by respondent).

Elk herd a problem, too large. Numbers too high hard on crop (?) and hard on pasture held in reserve for times when pasture is poor in short and reserves for spring and fall. Elk came in and clean it off. It's impossible to keep fences properly and need to be checked and refenced at least twice per week during grazing season. White tailed deer are too numerous and do fence damage. More licenses should be issued for elk. Most hunters are OK. Still a number of irresponsibles with no regard for property, sportsmanship, or landowners. Poaching is still a problem and property damage plus littering. The Armed forces keep a pretty good rein on all military people and deal out stiff penalties which is probably for misdemeanors. People really are the problem and acts of man. Leafy spurge is everywhere and getting worse. DND and R.M.S.C. are carrying on extensive spraying programs with Tordon 22K. Which is effective with one shot treatment but is costly. All levels of government should contribute to cost of solving this problem

Respondent 130

I have little knowledge of Shilo and am new as a land owner in Man. We have a similar unit here in Alberta at Suffield with the British Army. I feel as a vet from world war II that our military is in very poor shape. If it were not for the Germans at Shilo and British at Suffield we wouldn't have much of a tank army in Canada, we badly need these bases.

Respondent 131

I know I haven't been of much help to you but I live at the outer edge of the municipality so I

really haven't had anything to do with them but I do know that the noxious weeds are not kept under control.

Respondent 135

Sorry to be so late with this form. It is the victim of a dry harvest season!

Respondent 138

Mark. I have lived/worked at Shilo periodically for over 30 years. I firmly believe the "Base" is a "God-send" to Brandon and Area (economically). As we live about 7 miles from Shilo we often hear the guns firing, but they have little affect on us as far as noise is concerned. There has been many concerns about the control of leafy spurge on the firing ranges. This problem exists in numerous areas in the R.M. of Cornwallis and South Cypress. I do believe the Prov. Gov't should provide for chemical to landowners for the control of leafy spurge if they are concerned about the control of the weed. The "Shilo reserve" land is unsuitable for agricultural use.

Respondent 145

Sept 25th/84. Sorry about being late but was harvesting. Hope it helps in your course or your analysis.

Respondent 147

Not enough control over environment. Gouging soil, shells, leafy spurge. Why is this range in a fairly high populated area of Manitoba?

Appendix E

VARIABLE LIST BY QUESTION AND RECODE FORMAT

VARIABLE LIST

Section 1

Question	Variable Name
1.	MUNC
2.	YRSOWN
3.	CEREAL CASH DAIRY POULTRY PORKOP MIXED CATTLE HORSE RENT NOUSE OTHLAND
4.	CULTIVO FORAGEO OTHILO WOODO NHAPO OTHUILO CULTIVR FORAGER OTHILR WOODR NHAPR OTHUILR
5.	RESDIST
6. 6a)	EFFECT EFFTYPE
7. 7a)	SPURGE7 SPURDIST

Section 2

Question	Variable name
1.	CONCERN
2.	IMPACT
3(a)	ECOACT
3(b)	ECOWESTG
3(c)	SOCIAL
3a)	BENEFIT
4(a)	NOISE
4(b)	WILDL
4(c)	BURNS
4(d)	VEGTN
4(e)	LSPURGE
4(f)	FERRY
4(g)	GRWATER
4(h)	POACH
4(i)	HUNT
4(j)	ROADS
4(k)	AGLOSS
4(l)	DEPRED
4a)	WORSTF
4b)	WORSTS
4c)	WORSTT
5.	OTHBENF
	OTHPROB
6.	AMOUNT
7.	RESPINF
8.	SEAC
9.	LEASE
10.	FIRING
	PUBLACC
	HUNTSCH
	EQUIP
	ARTILRY
	EVALENV
	CONTENV
	MONTENV
	TIMEBURN
	LEASAGR
	OTHINF
11a)	MUNCGOV
11b)	DND
11c)	MDNR

12.	ELFED ELPROV ELMUNC ELNO ELOTH
13.	RANGE ADMIN OTHMILIT
14.	COMPEN

Section 3

Question	Variable name
1.	AGE
2.	SEX
3.	DEPEND PRESCH GRADE TEEN ADULT
4.	EDUC
5.	NONE ELK WTDEER WATER UPBIRD MOOSE OTHWILD

RECODE SYSTEM FOR CROSS-TABULATIONS

MUNC: Only respondents in the R.M.'s of Cornwallis, Oakland, North Cypress, and South Cypress were used.

YRSOWN: Years of ownership were grouped into 2 categories -- between 1 and 9 years and over 10 years.

Question 3, Section 1: Variables in question 3 were recoded into a new variable called "LANDUSE". Four categories were formed in this new variable -- cereal and cash crop farms; mixed farms; ranches; and do not use land. Cereal and cash crop farms include only those farms that indicated CEREAL and/or CASH. Ranches include farms that indicated only CATTLE and HORSE. Respondents who indicated they do not use their land or rent their land belong to the "do not use land" category. Mixed farms include the remaining combinations of responses to question 3

CULTIVO to OTHUILR: These 12 variables were recoded into three categories -- 1 to 159 acres; 160 to 640 acres; and greater than 640 acres.

RESDIST and SPURDIST: These variables were usually recoded into three categories -- less than 1 to greater than 3 miles; 4 to 10 miles; and greater than 11 miles.

EFFTYPE: This variable was recoded into positive and negative effects as follows:
Positive Responses:

1. For the better.
2. Employed by DND.

Negative Responses:

1. Noise and fires.
2. Dogs have gone deaf because of military activities.
3. Noise and/or vibrations.
4. Spurge infestation.
5. Military moved survey marker on private property.
6. Fire damage to private property.
7. Respondent's hog operation is considered a nuisance by DND.
8. Military presence has limited access to the Reserve for hunting.
9. Vandalism to private property by military personnel.
10. Restricted private airways.

SPURGE7, ECOACT to SOCIAL, and NOISE to DEPRED: For all 16 of these variables, responses of "don't know" were not included in analysis.

CONCERN, IMPACT, AMOUNT, MUNCGOV, DND, MDNR: For all six of these variables the six-point scales were evenly divided into three categories -- scale numbers 1 and 2; 3 and 4; and 5 and 6.

LEASE: Responses of "yes, to some extent" were grouped with "no" responses for analysis.

Question 12, Section 2: The variables in this question were recoded to create a new variable called "ELECT". The ELECT variable divides respondents into those who have contacted an elected official and those who have not. Because all respondents indicating "other" for this question mentioned that they had not contacted an elected official, responses of "other" were grouped with respondents who had not contacted an elected official.

AGE: Age categories 1 and 2 were grouped together, as were categories 3 and 4 and 5 and 6.

DEPEND: This variable differentiated respondents by whether they have dependents or not.

PRESCH: Refers to dependents between the ages of 1 to 4 years.

GRADE: Refers to dependents between the ages of 5 to 12 years.

TEEN: Refers to dependents between the ages of 13 to 17 years.

ADULT: Refers to dependents over the age of 18 years.

Question 5, Section 3: The variables for this question were recoded to create a new variable "HUNTING". The variable "HUNTING" divides respondents into hunting and non-hunting groups.

DATE: This variable was created to divide respondents into those who had returned a questionnaire by September 24, 1984 and those who had returned a questionnaire after this date.