



## File Report 55

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### ABSTRACT

A two part study was carried out by Compuheat Services Canada Inc. under the auspices of the Government of the Northwest Territories bear detection and deterrent research and training program at Cape Churchill, Manitoba in November, 1984. Part one was implemented to test the feasibility of using an infra-red system to detect (and also census) polar bears (*Ursus maritimus*) under natural arctic winter conditions, and to assess this system's usefulness as an early warning device. Part two consisted of a preliminary investigation into the feasibility of using an acoustic system as an effective and versatile deterrent system, which is physically harmless to polar bears. It was implemented to observe the effects of acoustic stimulation on bear behaviour and to determine any possible optimal frequencies for deterring these animals in their natural habitat. Results of part one indicate that the infra-red wavelength band of 8-14 microns is practical for use in detecting polar bears in their natural habitat, despite adverse weather conditions. Early warning device interfaced into the infra-red system proved to be 100% effective. The complete system was portable, simple to install and operate, and required little maintenance. Results of part two showed that most bears were sensitive to the 0.1 - 9.0 kHz range of frequencies, and were most effectively deterred at frequencies of 1.0 - 4.0 kHz. There was some indication that when this stimulus was presented in a pulsed mode it produced better results. Because of the small sample size and the limited testing period, further investigation is recommended to obtain conclusive results. A list of possible influencing factors is offered for consideration for further testing.