

RESEARCH HIGHLIGHTS

November 2003

BOREAL OWL STUDY– COMPONENT OF RIVER VALLEY ECOSYSTEMS STUDY

By Charles Maisonneuve

Expanded article with list of references cited and consulted can be viewed at www.iemr.org

Project Partners

Institute for Environmental Monitoring and Research
Société de la faune et des parcs du Québec
Natashquan Band Council

Background

The river valleys located in the Military Training Area (MTA) of Quebec-Labrador are particularly appealing for low-level flying because they provide a natural corridor appropriate for training routes and they enable pilots to practice avoiding radar detection. Given the relatively large number of low-level training flights occurring in river valleys and the biological importance of these valleys, the Institute has developed a research program over the past few years to investigate the impact of overflights on the ecological components of river valleys.



Birds of prey are located at the top of the food chain, and this makes them vulnerable to stress and changes in their habitat. They are therefore excellent indicators of the health of the environment, and several species have been chosen as indicator species in a number of locations around the world. In the area of Quebec-Labrador used for low-level flying, studies have been carried out in an attempt to identify the effects of the

flights on diurnal birds of prey. However, the increase in military activities at night has recently brought to light the need to initiate studies of nocturnal species as well. Searching for nocturnal raptor nests can involve considerable effort in the field and result in the discovery of only a limited number of nests, particularly in inaccessible regions. The best way to monitor an adequate number of nests with relatively little effort is to install nesting boxes for species that normally nest in natural cavities. In this context, the boreal owl is the most attractive target species in the Quebec-Labrador region. Not only does the boreal owl readily use nesting boxes, but it is recognized

that, in northern latitudes, this owl is basically confined to riparian forests in view of the relative scarcity of appropriate breeding habitats outside the river valleys. Consequently, the home range of the boreal owl is along watercourses. Such habitat use by the boreal owl should therefore promote this species' occurrence in the ecosystems targeted for study in the low-level flying area.

Hypotheses and Methods

Low-level flying could affect boreal owls in various ways. First, the flights could affect the hearing ability of these owls, which greatly depend on this sense to hunt the small mammals they feed on. The number of eggs laid by the female depends to a large extent on her physical condition, which is related to the

Inside this issue:

Boreal Owl Study	1
Boreal Owl Study (cont'd)	2
First Nations Communication and Support Strategy	2
Supersonic	3
Digital Vegetation	3
Gray Jay Fall Banding	4
IEMR Staff	4
Contact Information	4

BOREAL OWL STUDY (CONT'D)

hunting efficiency of the male and female. Boreal owls live in the same area year-round, and the number of eggs laid serves as an indicator of the feeding conditions in their home range. Also, it has been shown that large clutches produce more young. During incubation and part of the rearing period, the female normally stays in the nest, and the male provides food for her and the young. Consequently, a reduction in hunting efficiency could have an impact on the nesting effort and the survival of the young.

In September 2003, 600 nesting boxes were installed on the banks of the selected stretches of river. Half of these boxes were installed within the limits of the low-level flying area along the Natashquan River, and the other 300 were distributed along the stretches located to the south of the flying area as follows: 145 on the Natashquan River and 155 on the Aguanish River.



During the springs of 2004 and 2005, regular visits will be paid to the boxes for the purpose of collecting the data required to make comparisons between the flying area and the control area including:

- Nesting box occupancy rate
- Nesting effort (number of eggs)
- Nest attentiveness of the female and food supply provided by the male
- Nesting success
- Survival of the young
- Number and frequency of fault bars in the feathers
- Abundance of small mammals

Results of Exploratory Work Done in 2003

In 2003, some 100 nesting boxes were installed in the Sept-Îles region of the North Shore in order to fine-tune the methods used. Five of these nesting boxes were occupied by boreal owls, and this made it possible to develop certain devices that will be used in carrying out the study. Motion detectors were installed on three of the nesting boxes in order to get a proper count of the comings and goings of the birds. An infrared camera hooked up to a tape recorder was tested as a means of recording video images. This network of nesting boxes can continue to be used over the next few years. Experimenting

with noise recordings as a control disruptive effect might make it possible to gain a better understanding of the impact on the birds.

The first small mammal trapping campaign, carried out in September 2003 along the Natashquan River, showed that voles, the main prey of the boreal owl, were particularly plentiful. Close to 700 were caught with an effort of nearly 3000 trap-nights. These results seem to promise an excellent nesting season in 2004, and consequently, excellent conditions for the carrying out of this study.

FIRST NATIONS COMMUNICATION AND SUPPORT STRATEGY 2003-2004 PROGRAM

In January and February 2003, Natalie D'Astous, the community liaison officer for the First Nations Communication and Support Strategy completed the first round of visits to the communities. The report of this visit has been received and was accepted by the Institute Board of Directors at the October 2003 meeting.

During these visits, Ms. D'Astous met with expert committees in Mingan, LaRomaine, Pakua Shipi, and Sheshatshiu. The objectives outlined for these visits were to:

- * Transmit information from the Institute and to continue to present this information in a form accessible to the Aboriginal experts in order to obtain their opinions on such topics as the Lac Joseph and Red Wine Mountain Caribou Herds, the spring staging areas (Ashkui), and a study of the effects of military flights on the Boreal Owl and Gray Jay which is being conducted within the framework of the River Valley Ecosystem Study.
- * Present videos which highlighted the field work involved with Moulting Black Ducks at Lac Fourmont and methodologies used to capture small mammals on the Churchill River during the summer of 2002.
- * Listen to "Rare Air" a radio program produced with the expert committee from Sheshatshiu in December 2001.
- * Obtain authorization from expert committees from Mingan, LaRomaine, and Pakua Shipi to publish a map in an article explaining this program in a publication of Rangifer magazine.

Ms. D'Astous is presently completing the second round of visits under this program, and a draft report will be prepared and forwarded to the Scientific Review Committee.

SUPERSONIC NOISE DISTURBANCE AND WATERFOWL BEHAVIOUR

By Karen Gosse (Minaskuat)

Allied air forces conducting low level flight training at 5 Wing Goose Bay have indicated the need to expand current activities to meet changing operational requirements. In response, the Department of National Defence (DND) proposed to conduct limited supersonic flight trials during August 2003. The trial was to involve one CF-18 fighter aircraft from 3-Wing Bagotville and a study team on the ground, supported by Minaskuat (a partnership created between Innu Environmental and Jacques Whitford). The Institute for Environmental Monitoring and Research (IEMR) expressed interest in the proposed trials of DND, leading to the development of a separate, concurrent study designed to collect preliminary field observations of waterfowl and their response to sonic booms from CF-18 noise events. Minaskuat was also contracted by the IEMR to focus on the behavioural response during and following these events as well as other observations that could be used for future and more rigorous testing.

Preliminary field observations were scheduled to occur on 8 August, with supersonic trials planned for 10 August. Post-Treatment observations were scheduled for 15-16 August. During field preparation on 7 August, however, three forest fires in the study area had increased to the point that low altitude helicopter travel was unsafe. A surveillance of the surrounding area indicated there were two large fires burning, both approximately 5 km west of the proposed observations stations. With the prevailing winds (West and North West), the study area was engulfed in smoke. As the fires in the study area were not burning near private property or merchantable timber, the Provincial Forestry indicated that they would monitor the fire status but would not expend any effort to fight these fires. In response, Minaskuat delayed the start of the preliminary field observations until the extent of the fires could be better assessed.

On the morning of 8 August, fire monitoring crews reported that the study area contained 10 fires, with several fires now closer (<3 km) to the planned observation points. With no significant rain in the forecast for more than 5 days, the Base Commander and DND representatives (Goose Bay office) met to review the situation. Given that the availability of the CF-18 could not be expected beyond 15 August, there was a possibility that only 1-2 days were available (if any) for the trials. Furthermore, given the human safety issues and the possible influence of smoke on the behavior of waterfowl in the study area, the Goose Bay office of DND cancelled the program by noon that same day.

Status. The possibility exists to continue this program in 2004. Should the program be re-scheduled, the background materials and setting for the trials are in place and can be readily implemented.

DIGITAL VEGETATION AND HABITAT DATA

Since 1997, the lack of adequate digital vegetation and habitat data has been a concern for the Institute and its partners in addressing research questions especially those related to waterfowl. In September 2003, the Institute purchased eCognition, an object oriented image analysis software, and PCI Geomatica 9, the most complete geospatial software solution for remote sensing, photogrammetry, GIS, and cartography. With these software packages the Institute has the capability to perform in-house analysis and habitat classification of Landsat and high-resolution imagery such as Ikonos and Quickbird. Additionally, Ikonos imagery available from archive was acquired from Global GeoScience in Ontario. Tony Parr, the Institute's GIS Specialist, traveled to Dartmouth to undergo a week of intensive training in both PCI Geomatica and eCognition software at Environment Canada's office and arrangements have been made for second week of training in the New Year.

Sarah Hall from the Environment Canada's GIS lab in Dartmouth has been contracted to undertake the development of a simple on line mapping application to show initially the black duck joint venture data and other waterfowl data sets that the IEMR has available for Labrador. The system is totally interactive and its foundation layers are based on a series of national and regional topographic base maps at various scales. The application is still in the development stages; however, will be made available to various participants utilizing secure passwords based on user privileges in the near future.

INSTITUTE FOR ENVIRONMENTAL MONITORING AND RESEARCH

P.O. Box 1859, Stn. B
Happy Valley - Goose Bay, Labrador
AOP 1E0

Phone: 709-896-3266
Fax: 709-896-3076
Email: iemr@iemr.org

GRAY JAY 2003 FALL BANDING PROGRAM

By Karen Gosse (Minaskuat)

In March 2003, Minaskuat Limited Partnership was contracted by the Institute for Environmental Monitoring and Research (IEMR) to conduct research on the effects of noise disturbance during take-off and landing of military aircraft on the behavior of nesting Gray Jays. Based on experience gained during the first field investigation of this issue during April-May 2003, and in anticipation of the continuation of the Gray Jay monitoring program in 2004, the need to continue this project with the capture, banding and sexing of individuals during fall 2003 was identified. Specifically, if monitoring of nesting activity during the 2004 military training is to be carried out, females must first be distinguished from males in order for efficient location of nesting areas.

To address this problem, a fall (period when sexes are distinguishable by weight) banding program commenced on 12 November. Experimental study locations were chosen near the ends of the airport runways at 5 Wing Goose Bay in areas where birds had been observed during previous surveys. Control trapping stations were established in Black Spruce dominant areas within the valley portion of the community. Birds were captured using Potter traps baited with suet and/or bread, and individuals were banded using unique combinations of plastic color and metal numerical bands for later identification. As accurate weights were imperative to the identification of males and females,



all captured/recaptured birds were weighed using a precision hand-held spring scale. Within 2 weeks, the study team had successfully captured 22 birds, including several (n=7) recaptures from the spring program. Though considerable overlap existed in measured weights, comparisons with records from Algonquin Park, ON, mainland Quebec, and on Anticosti Island in the Gulf of St. Lawrence (provided by Dan Strickland, Research Biologist, Algonquin Park, ON) provided insight regarding the sexing individuals in Labrador. Of the 22 birds captured, 8 are believed to be female, 5 considered male, and 9 unknown (i. e. weights are within the range cited for both males and females).

Future Research. The study team hopes to continue the Gray Jay monitoring program with the relocation and identification of banded pairs and/or individuals in March 2004. Once identified, the team plans to locate active nests through 1) offering nesting material (cotton batting) to pairs and following the adult/s to the nest, 2) deploying radio transmitters on known females and locating nests during early incubation stages, or 3) a combination of 1 and 2. Active nests will then be monitored during and outside of military aircraft events to examine reactions to noise disturbances resulting from such activities.

- What's New on our web site**
- Osprey Workshop Presentations October 16-17, 2003
 - Photo contest 2003
 - Terra Borealis #3
 - Waterfowl Conference 2002
 - IEMR Annual Report 2002

IEMR STAFF

Moncton, New Brunswick

Louis LaPierre, Ph.D.
Institute Chair

Gloria Belliveau
Executive Assistant

Happy Valley- Goose Bay, Labrador

Maureen Baker
Administrative Manager

Natasha Canning
Secretary

Colin Jones (on leave)
Wildlife Biologist

Tony Parr
GIS Specialist

Annette Greenslade
Post Doctoral Fellowship



Research Highlights

Information for this issue of Research Highlights was provided and compiled by Institute staff. If you have any comments or if you have information you would like to see included, please contact the Institute's office.