



**2013-2014
Agriculture Research Initiative**

Predator Control Project Report



Project Leader:

Paul Dunphy

Industry Development Officer

Report Prepared by:

Paul Dunphy and Jennifer Roper

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Introduction

Predation on sheep has been identified as a major constraint to growth and development of the sheep industry in Newfoundland and Labrador. In 2011 and 2012 a Predator Control Project was undertaken by NL Department of Natural Resources (DNR) in partnership with Sheep Producers Association of Newfoundland and Labrador (SPANL), to investigate the effectiveness of electric fencing in controlling predators on regional pastures. Long Harbour pasture was selected initially, as it had experienced considerable losses due to predators in recent years and the Long Harbour Pasture Committee expressed interest in using their facility for the project. Since that time, 3 additional pastures have been identified by the project committee as high risk for predation: Port-au-Port, Comfort Cove, and Salmon Cove Pastures.

The project was designed to evaluate the effectiveness of electric fencing as a predator control measure for sheep on regional pastures. There were two distinct components to the proposed Agricultural Research Initiative project in 2013:

1. Provide electric fencing and video surveillance to Port-au-Port, Salmon Cove, and Comfort Cove Pastures.
2. Monitor electric fencing on Long Harbour Pasture using stealth camera surveillance to determine predator presence, type, and timing of movement.

With the overall goal of the project being to improve the economic viability of the Newfoundland and Labrador sheep industry, the following objectives were developed:

1. Ensure maximum utilization of regional pastures with a fencing system to ensure predator losses are minimized.
2. Evaluate electric fencing on an extensive grazing system from the point of view of effectiveness for predator control and cost effectiveness.
3. Understand sheep predator cohorts through video surveillance on selected regional pastures.



Figure 1. Sheep on pasture project area.

Methods and Materials

This phase of the Predator Control Project involved the installation of electric fencing, surveillance cameras, and a fence power source at Port-au-Port, Salmon Cove, and Comfort Pastures. Due to unforeseen circumstances, fencing was only installed on Port-au-Port Pasture. The second component of the 2013 project was to continue monitoring predator activity at Long Harbour Pasture using the installed stealth cameras.

Block wire line fence and page wire is the first line of defense against predator attacks on the Long Harbour and Port-au-Port Pastures, respectively. The electric fence acts as a second line of defense on both pastures. The page wire fence was installed on approximately 45 acres at Port-au-Port Pasture by August 2013. Simultaneously, 3-wire tensile (2 live wires and one ground) electric fencing (Figure 2) was installed. Enclosing 41.25 acres of the Long Harbour Pasture is 5-wire tensile (3 live wires and two grounds) electric fence (Figure 3), while the remaining 21.5 acres of pasture is protected by 3-wire tensile electric fencing. The high tensile wire is 12.5 gauge (Class III) galvanization and 200,000 KSI. The electric source is Speedrite 12 joule, 12 volt systems (Figure 4), using a solar panel on the pasture storage sheds (Figure 5).



Figure 2. The 3-strand electric fencing and page wire fencing installed at Port-au-Port Pasture.



Figure 3. The 5-strand electric fencing and block wire fencing installed at Long Harbour Pasture.

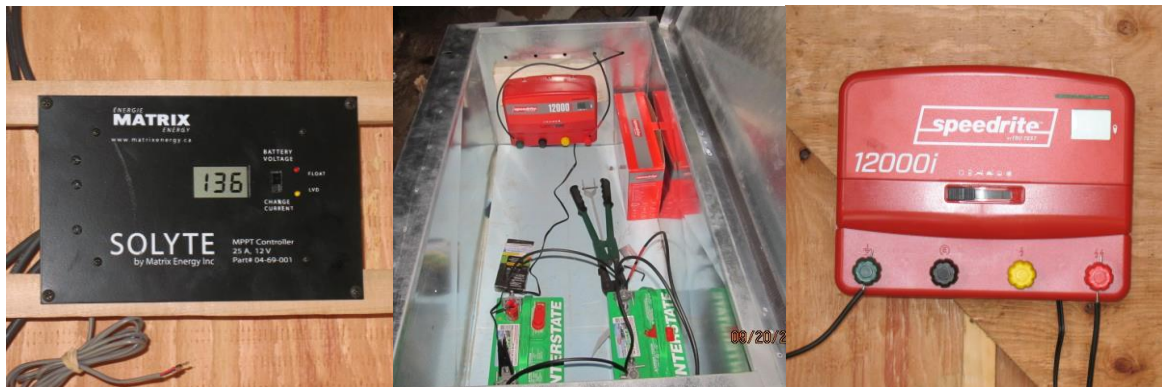


Figure 4. Batteries and energizer for electric fence stored inside the pasture buildings at Port-au-Port and Long Harbour Pastures.



Figure 5. Solar panel power sources on the top of the pasture buildings at Port-au-Port and Long Harbour Pastures.

To help researchers better understand sheep predation, video surveillance cameras were installed in 2012 on Long Harbour. The stealth cameras were strategically located to detect perimeter contact of predators with electric fencing. Surveillance cameras recorded types of predators (if any), effectiveness of the electric fencing (shocks to predators), and potential breaches of the electric fence. The cameras used during this project were STC-U840IR (Stealth Cam), which had the capability to capture both daytime color, and night time black and white. The cameras were motion sensor activated by anything within 50 feet to capture both digital video with audio clips and high resolution 8.0 megapixel still images. Only 1 camera was installed on Port-au-Port Pasture over the 2013 pasture season, with additional cameras installed in the off season.



Figure 3. Surveillance camera on the outside perimeter of the Long Harbour Pasture electric fence.

The pasture was monitored weekly throughout the pasture season. Department of Natural Resources personnel did not have a set schedule for site visits but based timing of visits on battery strength and the number of pictures on cameras. Visits consisted of replacing

batteries when necessary, removing video chips from cameras and, walking the fence perimeter to ensure there were no disruptions or interruptions of electric charging. Video chips were later analyzed for predator movements.

The final component of the 2013 phase of the project was to provide electric fencing and minimal video surveillance to Salmon Cove and Comfort Cove Pastures. However, Salmon Cove Pasture has been involved in a land dispute (private ownership inside the fenced area). This pasture began installation of fencing but halted work during the summer. Comfort Cove Pasture requires new block wire fencing and will begin a 5-strand electric fence in 2014. Materials were purchased in 2013 for both sites.

Results

The predator control project proposal in 2013 called for an evaluation of the effectiveness of electric fencing as a predator control method, with the use of cameras to help better understand sheep predator and predator cohorts through video surveillance on selected regional pastures.

Electric fencing on the community Long Harbour pasture has eliminated predation over each of the last 4 grazing seasons. To date there has been no predator attacks on the sheep flock within the confinement area and the electric fencing was operating continuously for the entire pasturing period. Using the 2009 predator loss total of 103 sheep/lambs as a control it appears that the 3 and 5 strand electric fencing systems have been effective as a predator control method.

A total of 171 sheep/lambs were placed on Long Harbour Pasture in 2013. The fencing was checked to ensure continuous operation and the sheep were checked for predator attacks. This was conducted a minimum of once a week and more often when work was done by the pasture operators. Sheep were removed in late November 2013.

There were 24 sheep pastured on the Port-au-Port Pasture after the electric fence was erected in summer 2013. During their time on pasture there were no breaches of the electric fence, however 9 animals were killed by wild dogs that accessed the pasture using a culvert. This assumption was made based on personal observation of the dogs seen in the culvert. The culvert was sealed with page wire and it is anticipated that this should control dog predation in 2014.

As in 2012, stealth cameras did not capture any predator activity over the 2013 predator season, however many other visitors were caught on film, including moose, birds, and humans (Figures 7 through 9).

The Salmon Cove Pasture fencing installation was halted because of land claims by individuals inside the fenced area. Department of Natural Resources staff is working with the pasture operators and land owners to resolve the issue. In 2014 the pasture committee will avoid the contested land area as part of the fencing project and return fencing materials to be deployed elsewhere. Salmon Cove Pasture will be enclosed using block fencing and 3-strand electric fence. Comfort Cove Pasture will begin a fencing project in 2014, using 5-strand electric fencing as opposed to 3-strand because the primary predators are bears. Materials were purchased in 2013 but because of late arrival and lack of labor the installation was postponed until 2014.



Figure 7. The camera in night vision, picking up some visitor activity.



Figure 8. A visitor activated the camera.



Figure 10. Trespassing was a common theme during hunting season on Port-au-Port.

Discussion

The results of the project appeared positive in terms of effectiveness of the electric fencing for predator control. This was confirmed through the use of surveillance cameras, which monitored the pasture perimeter throughout all hours of the day during the pasture season. No predator kills were observed throughout the course of the project, which was confirmed by video surveillance that did not record any predators.

Based on images taken by the Stealth Cams, such as that shown in Figure 10 the electric fence kept predator cohorts out of the pasture as well. It is thought that in the past moose would breach the block wire fences by knocking them over. This would provide easy access to predators to the enclosed pasture and sheep.

In terms of the electric fencing system, the 5-strand and 3-strand wire configurations performed similarly. Being that it is more affordable and provided the same level of security to the sheep the 3-strand would be the configuration recommended for future community pasture designs if the predator problem was dogs or coyotes. However, it is thought that if larger animals such as bears are the predators, 5-strand wire configurations may be more appropriate, such as with Comfort Cove.



Figure 10. A moose obviously got a scare from touching the electric fence in Long Harbour.

Economic Impact Analysis

This project was assessed in terms of cost of the electric fencing system compared with block wire fencing alone. A properly constructed block wire fence is the first line of defense in terms of predators. However, this is a cost that is essential for any pasture operator to keep sheep enclosed. The additional cost is the electric fencing expenditure and associated power source. Excluding costs associated with pasture labor and modifications (because wire was on the outside of the posts) the material cost was \$5,000.00. Assuming a ten year life of the equipment, the cost will be \$500.00 annually.

With predator losses eliminated from 103 animals in 2009 to zero in 2013, the electric fence costs are minimal. The value of three lambs would exceed the annual \$500.00 cost for the capital expenditure.

Using the outlined assumptions and if it can be determined that the electric fencing was solely responsible for predator control, it makes economic sense to invest in electric fencing.



Figure 10. Pasture area in Long Harbour community pasture.

Conclusions

Electric fencing is an effective predator control method on regional and community pastures and it can assist with maximizing utilization of the regional pasture base in the province.

With the use of surveillance cameras, it was confirmed that predators did not breach the electric fencing. Therefore, it is concluded that electric fencing on community pastures appear to be a viable and effective predator control measures.