

**Newfoundland and Labrador
Small Mammal Monitoring Network
2009 Season Report**

June 15, 2010

Bruce Rodrigues
Ecosystem Management Ecologist
Dept. of Environment and Conservation
Wildlife Division



Newfoundland and Labrador Small Mammal Monitoring Network 2009

Recognizing the importance of small mammals in northern ecosystems, a number of interested organizations across the province worked together to establish a small mammal monitoring network (SMMN) in 2007. The Wildlife Division worked in partnership with the Provincial Forestry Division, Institute for Environmental Monitoring and Research, Parks and Natural Areas Division, Stantec (formerly Jacques Whitford Limited), Innu Nation, Labrador Métis Nation, Nunatsiavut government, Miawpukek First Nation, Vale Inco, and the Atlantic Canada Conservation Data Centre.

The project goals are to:

- 1) Identify species and the distribution of species across the province
- 2) Develop population trend data
- 3) Track changes in species distribution
- 4) Establish a reference collection of species in the province
- 5) Disease monitoring and early detection
- 6) Create a database to contribute toward general status information, tracking of invasives, and research and management projects
- 7) Establish consistent data collection methodology across province

Method and Results

Small Mammal Monitoring partners set up trapping grids in their local areas representative of typical habitat for that area. Site preference was given to areas that would remain free from disturbance for at least 10 years. A grid of 8 lines with 15 stations on each line was set at each site. Two snap traps were placed at each station providing a total of 240 trap nights/station/day. Stations were run between August 15 and September 30 – over 3 consecutive nights for a total of 720 trap nights/station/year.

In Labrador 8 of 10 sites were run this year (Fig. 1). Sites were mainly forested but also represented bog and barren habitat. Participating partners in Labrador included Innu Nation, Labrador Métis Nation, Institute for Environmental Monitoring and Research, the Departments of Environment and Conservation (Wildlife) and Natural Resources (Forestry). On the island, 11 of 14 currently active sites ran grids in 2009 (Fig 1). Sites on the island represented primarily forested areas including mature, regenerating, and PCT stand types. Other habitats selected included bog, and barrens. Participating partners in Newfoundland included the Wildlife Division, Forestry District Offices, Parks and Natural Areas Division.

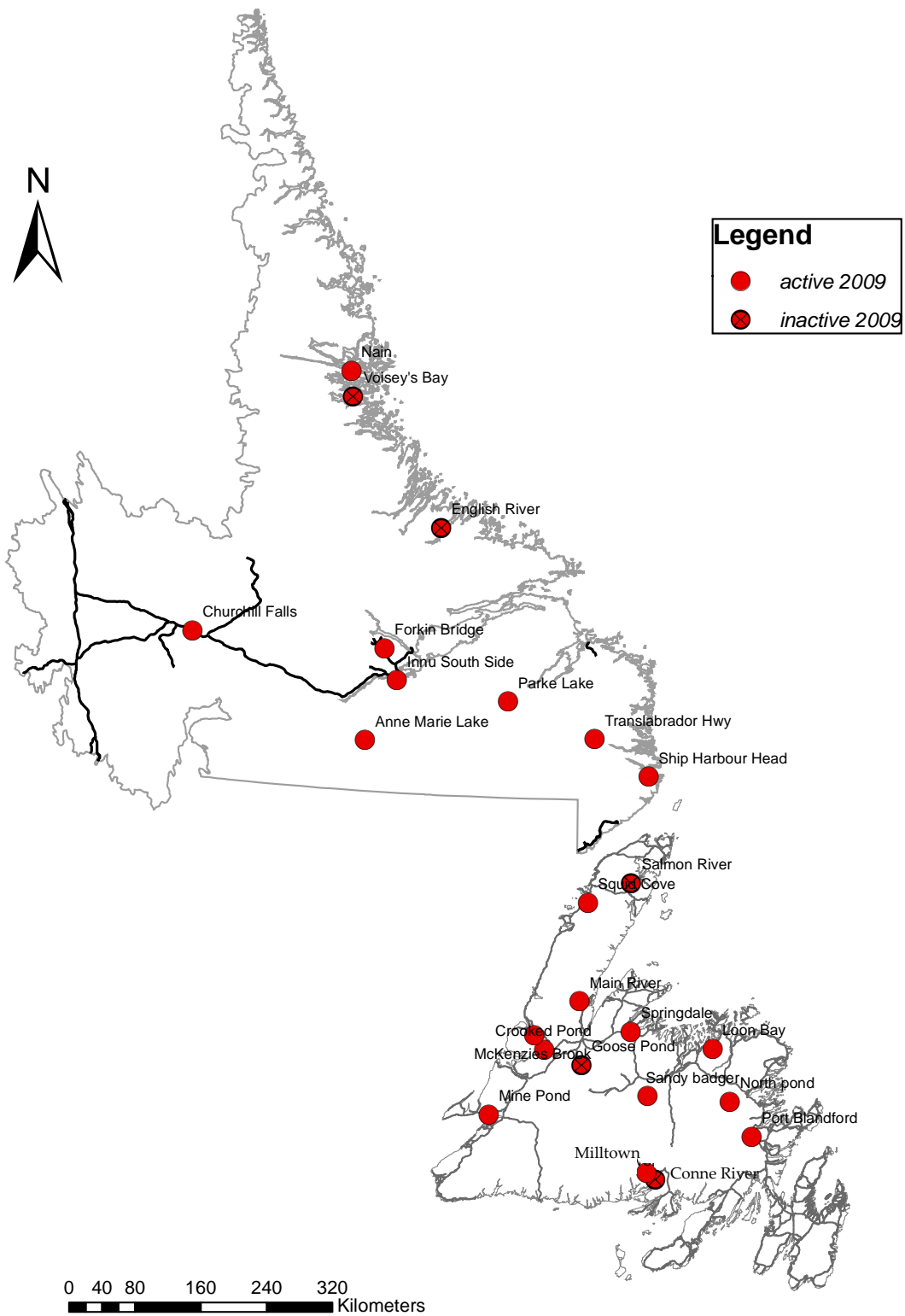


Figure 1: NL Small Mammal Monitoring Sites

In Newfoundland there were a total of 472 captures over 11 sites (Fig. 2), which equates to an average of 6 captures/100 trap nights. Four species were captured in Newfoundland in 2009 (Table 1), the same species recorded in 2008. Only four species were recorded during regular monitoring in Labrador, down from 7 species in 2008 (Table 1). Numbers in Labrador fell dramatically and likely represent the lowest point in the current population cycle. Overall 37 small mammals were captured over 10 sites in Labrador (Fig. 3), which equates to 0.5 captures/100 trap nights. With such low small mammal populations there is a high probability that furbearer, other predators and alternate prey will have experienced increased pressure on their populations and reproductive success.

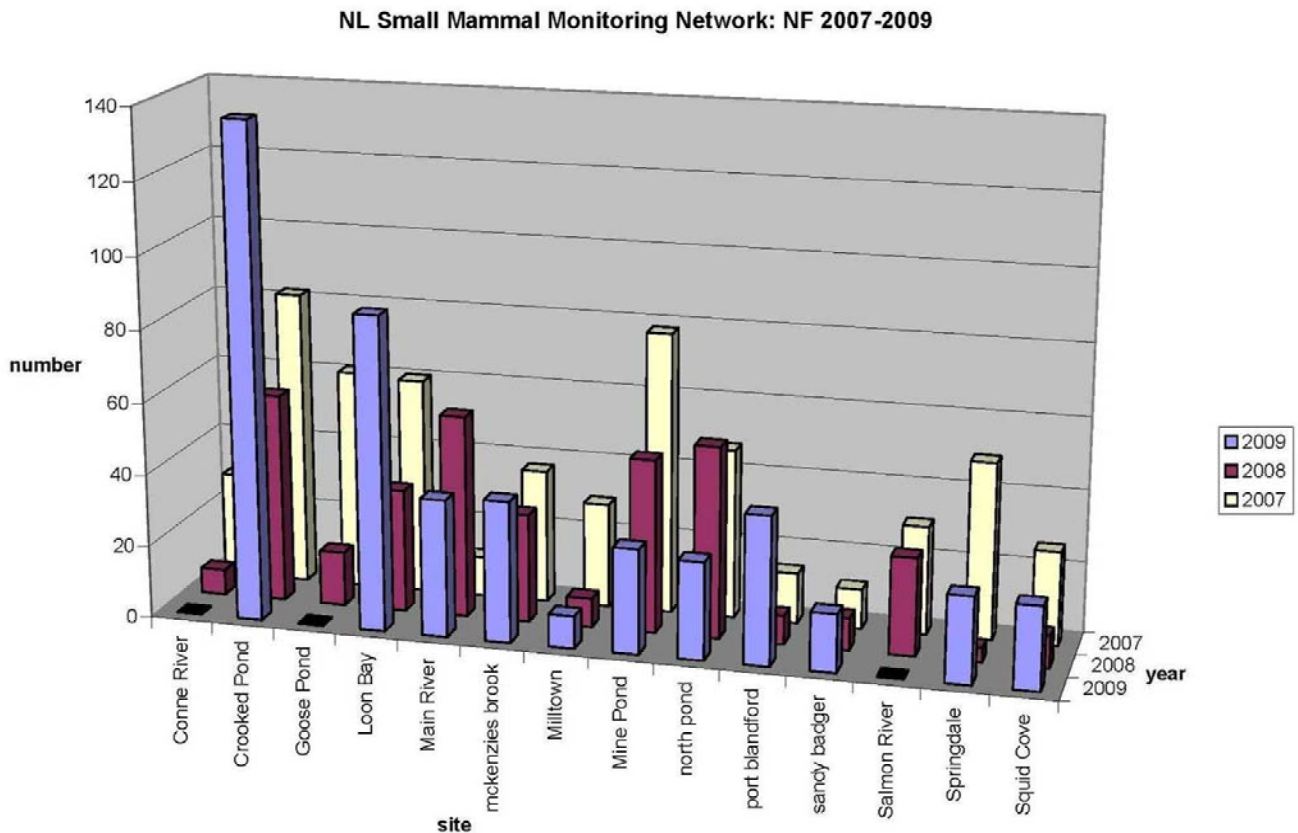


Figure 2: NL Small Mammal Monitoring Network captures by site from 2007-2009 for Newfoundland

NL Small Mammal Monitoring Network: Labrador 2007-2009

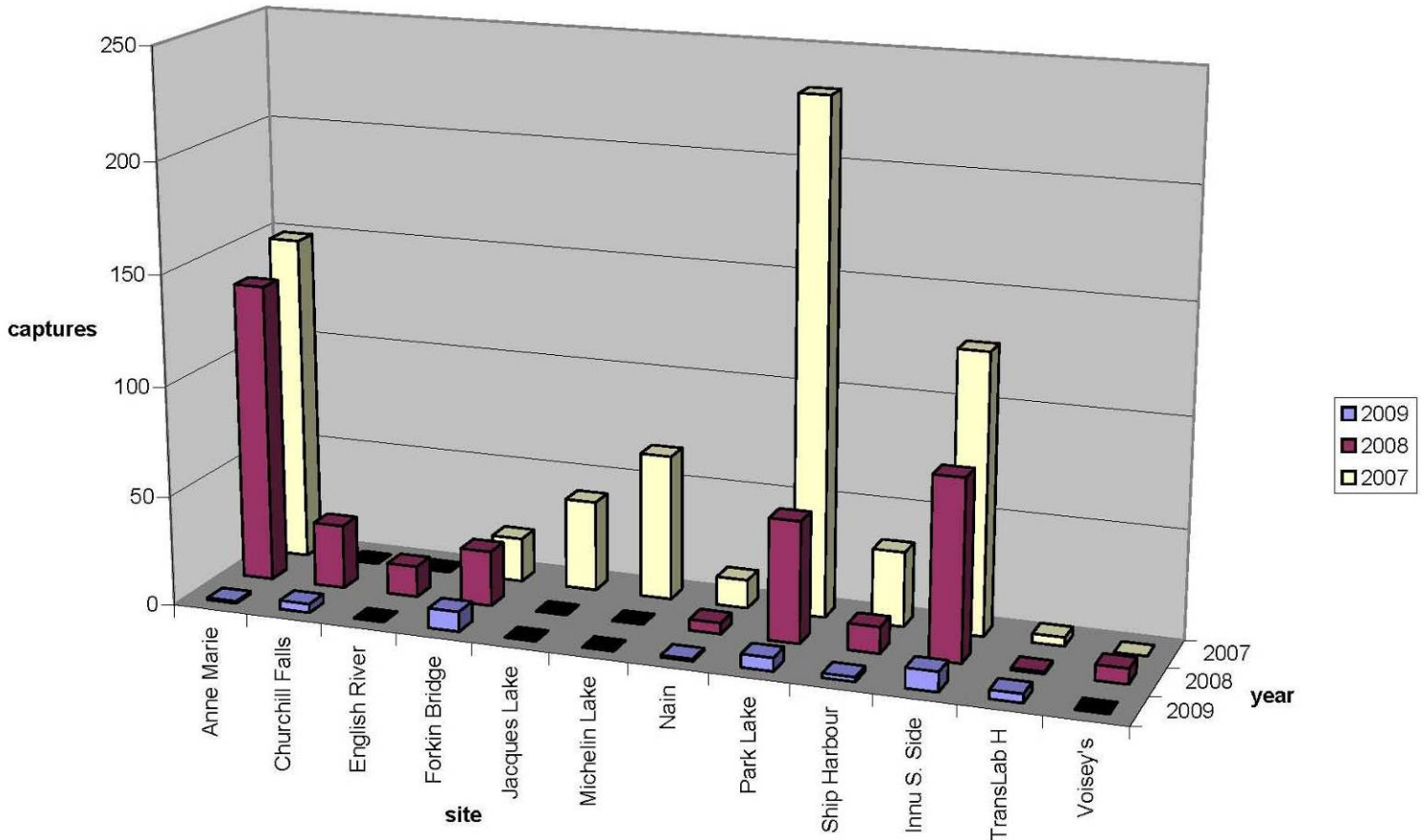


Figure 3: Small Mammal Monitoring Network Captures by site 2007-2009 for Labrador

Analysis of the number of captures/site between 2008 and the 2009 monitoring seasons (Table 2) indicated a dramatic decline across Labrador. Newfoundland, on average, had an increase in relative population numbers – though trends by site appeared more variable than Labrador. Some areas where Red-backed Voles recently expanded, such as Port Blandford, experienced large increases while other sites like North Pond declined. In areas where Red-backed Voles have likely inhabited for a number of years, such as Mckenzie's Brook and Crooked Pond, there were also fluctuations between sites. Understanding such trends will likely require more detailed analysis- looking at differences at both the species and habitat level. See Appendix A for more detailed information on 2007-09 capture data.

**Table 1: Small mammal captures by species and region for 2007 to 2009
NL Small Mammal Monitoring Network**

Family	Scientific Name	Common Name	Insular Newfoundland			Labrador		
			2007	2008	2009	2007	2008	2009
Dipodidae	<i>Napaeozapus insignis</i>	Woodland Jumping Mouse	N/A	N/A	N/A	-	-	-
	<i>Zapus hudsonius</i>	Meadow Jumping Mouse	N/A	N/A	N/A	-	X	-
Muridae	<i>Clethrionomys gapperi</i>	Southern Red-backed Vole	X	X	X	X	X	X
	<i>Clethrionomys glareolus</i>	Northern Bank Vole	-	-	-	N/A	N/A	N/A
	<i>Dicrostonyx hudsonius</i>	Labrador Collared Lemming	N/A	N/A	N/A	-	-	X*
	<i>Microtus chrotorrhinus</i>	Rock Vole	N/A	N/A	N/A	-	-	-
	<i>Microtus pennsylvanicus</i>	Meadow Vole	X	X	X	X	X	X
	<i>Mus musculus</i>	House Mouse	-	-	-	-	-	-
	<i>Peromyscus maniculatus</i>	Deer Mouse	-	X	X	X	X	-
	<i>Phenacomys ungava</i>	Eastern Heather Vole	N/A	N/A	N/A	X	X	-
	<i>Rattus norvegicus</i>	Norway Rat	-	-	-	-	-	-
	<i>Synaptomys borealis</i>	Northern Bog Lemming	N/A	N/A	N/A	X	X	X
Soricidae	<i>Sorex cinereus</i>	Masked Shrew	X	X	X	X	X	X
	<i>Sorex hoyi</i>	Pigmy Shrew	N/A	N/A	N/A	-	-	-
	<i>Sorex palustris</i>	Water Shrew	N/A	N/A	N/A	-	-	-
Talpidae	<i>Condylura cristata</i>	Star-nosed Mole	N/A	N/A	N/A	-	-	-

*trapping conducted outside network

Table 2: Total captures of small mammals 2008 and 2009, NL Small Mammal Monitoring Network

Location	Total Sites run 2009	Overall Captures 2009	Sites with >10 captures overall and complete data for 2008 and 2009 seasons			Change in captures 2008-09 (averaged across sites)	95% C.I.
			#	Captures 2008	Captures 2009		
Newfoundland	11	472	11	316	472	+124%	±107%
Labrador	8	37	6	341	32	-85%	±9%

Red-backed Vole Distribution

The introduced population of the Red-backed Vole has continued to spread across the island (Fig 4). Found to have just reached Gambo in 2008, this species was captured at the Port Blandford monitoring site in 2009. Opportunistic trapping, by Parks staff, also confirmed the presence of the vole in Terra Nova National Park. With historic small mammal and predator data having been collected in Terra Nova a unique opportunity exists to document changes

brought about by the arrival of the Red-backed Vole. Knowledge gaps still exist in the distribution of Red-backed Voles and other small mammals, particularly in portions of the Northern Peninsula and all of the Avalon. To fill in these gaps trapping blitzes and the establishment of new network sites are being planned for 2010. Based on current movements it is still anticipated Red-backed Voles will spread entirely across the island in 2-3 years.

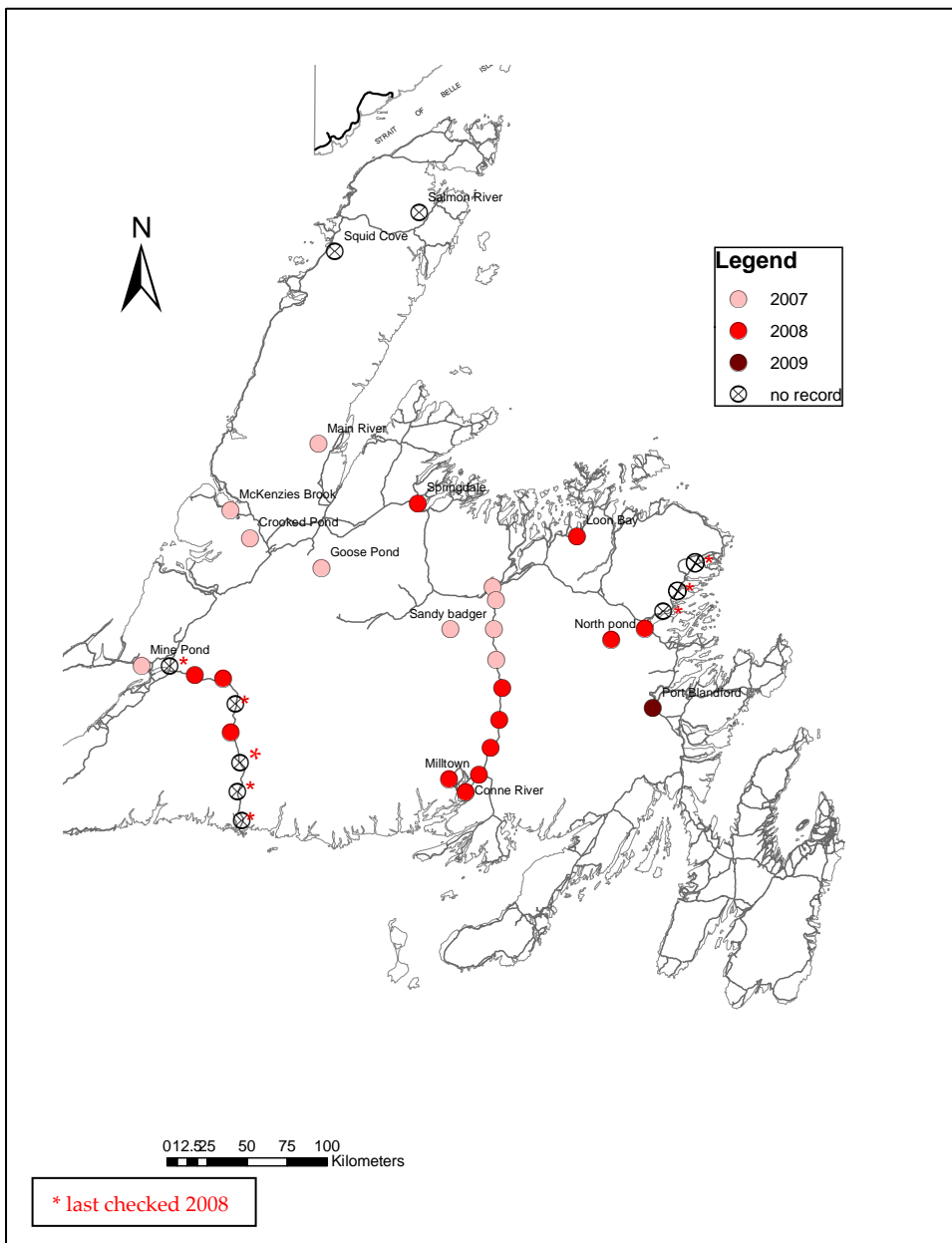


Figure 4: Red-backed Vole Dispersion 2007-2009

Related Projects

While the primary goal of the SMMN is to provide longterm monitoring of small mammal populations, efforts are made to maximize the use of collected specimens. Specimens have been contributed toward other projects that allow us to better manage and conserve species.

Genetic Analysis

A representative sample of Red-backed Voles will be genetically analyzed to help answer some basic questions about the species in the province. This work is being conducted in partnership with the Memorial University of Newfoundland Genomics lab. One of the first questions to be addressed is the source(s) of origin of the introduced population of Red-backed Voles on the island. Genetic analysis may also explain the morphological variation present in small mammals of the Stephenville/St. Georges area that is lacking in other parts of the island



Figure 5: Variation of Red-backed Voles collected from the St. Georges area

(Fig.5). Labrador Red-backed Voles will be used for comparison and also to explore the potential for distinct populations of voles in Labrador. Results from this work are expected in the fall of 2010.

Meadow Vole genetic work is planned after the completion of the Red-backed Vole study. Based on morphological differences, the island Meadow Vole is considered a unique subspecies (Bangs 1894). Genetic work on the Meadow Vole will hopefully determine the distinctiveness of the island population.

Workshops

Three small mammal workshops, hosted by the Wildlife Division, were held in the province between the winter of 2009 and the spring of 2010. Goose Bay, Corner Brook and Clarenville were the locations of the individual workshops. The workshops provided an opportunity for partners and other interested groups to review the current protocol, learn about the results of the network to date, and learn about the small mammals of the province. Additional support and logistics were provided in Goose Bay by the Institute for Environmental Monitoring and Research (IEMR), Torngat Secretariat, and College of the North Atlantic. In Clarenville, logistics and support was provided by the Clarenville District Forestry Office and the Dept. of Transportation and Works. The following groups were represented at each workshop:

Table 3: Small Mammal Workshop 2009-2010 attendance

Goose Bay	Corner Brook	Clarenville
Dept. of Natural Resources (DNR)-Goose Bay	Wildlife Division- Corner Brook	DNR- Clarenville
Nunatsiavut Government	Stantec Limited	DNR- Milltown
Innu Nation	DNR-St. Georges	DNR-Gambo
Labrador Metis Nation	DNR-Lewisporte	PNAD-Butterpot P.P.
Institute for Environmental Monitoring and Research	DNR-Springdale	DND-Gambo
Torngat Secretariat	DNR-Roddickton	Parks Canada-Terra Nova N.P.
Wildlife Division-Goose Bay	Wildlife Division- St. John's	DND-Gander/Eastern
Protected Areas Association	DNR-Bishop's Falls	DNR-Animal Health Division
Nature Conservancy of Canada	DNR-Massey Drive/Western	DNR-Paddy's Pond
Stantec Limited	Parks and Natural Areas Division (PNAD)-Deer Lake	
Atlantic Canada Conservation Data Center		



Goose Bay workshop 2009



Meadow Jumping Mouse Skull

Other projects

- Specimens were contributed to Memorial University for lab instructional purposes.
- Specimens were used for predator diet studies- comparing guard hairs of known prey items and also looking at isotope signatures for comparison with predator stomach contents
- The Wildlife Division continues to retain reference specimens for any future comparative need or genetic work. Plans are also underway to have specimens housed and available for reference in both parts of the province.
- All remaining specimens are submitted to Provincial Animal Health for disease and parasite testing. Results of this work are pending.

Acknowledgements

Once again, partners continue to provide great support for this project. Though names have inadvertently been missed, thanks goes out to the following people involved this year: Kevin Robertson, Chris Callahan, Shane Hann, Emily Kissler, Caryn Smith, C. Rumbolt, Dale O'Leary, Charles Gaulton, Shawn Avery, Terry Kelly, Rick Clarke, Bob Calloway, Alvin Boyd, Woodrow Rumbolt, Neil Bixby, Joe Gillingham, Tyson Haggett, Tony Parr, Frank Phillips, Rebecca Parsons, Ted Pardy, James Martin, George Morris, Wayne Russell, Maurice Jacques, Simon Kohlmeister, Jennifer Mitchell, Leah Soper, Blair Adams, Guy Playfair, Larry (Sandy Badger), Robin (Sandy Badger), Perry Stuckless, Joanne Winsor, Matthew Wells, David Parsons, Al Slaney, Chris Oxford, Grant Boyd, Andrew Gillingham, Ryan Critchley, David Elliot, and others who have assisted with small mammal grids in 2009.

Appendix A: 2008-09 Capture Results by Species and Site

Table 1: Small mammal captures by site for 2008-09 NL Small Mammal Monitoring Network (island portion)

Site	Deer Mouse		Masked Shrew		Meadow Vole		Red-backed Vole		SITE TOTAL	
	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009
Conne River	—	—	—	—	6	—	1	—	6	
Crooked Pond	—	—	21	41	1	—	36	96	58	137
Goose Pond	—	—	—	—	—	—	15	—	15	
Loon Bay	—	—	20	9	—	—	14	78	34	87
Main River	—	—	5	—	—	—	50	38	55	38
mckenzie's brook	—	—	10	14	13	5	7	20	30	39
Milltown	—	—	2	5	5	3	1	1	8	9
Mine Pond	2	3	41	13	—	—	5	13	48	29
north pond	—	—	38	3	—	1	15	23	51	27
port blandford	—	—	8	7	—	—	—	34	8	41
Salmon River	—	—	27	—	—	—	—	—	27	
sandy badger	—	—	—	1	—	—	9	15	9	16
Springdale	—	—	1	15	—	—	3	9	4	24
Squid Cove	—	—	9	18	—	5	—	—	9	23
Species Total	2	3	182	126	25	14	156	327	365	470

Table 2: Small mammal captures by site for 2008-09 NL Small Mammal Network (Labrador portion)

	Bog Lemming		Deer Mouse		Heather Vole		Masked Shrew		Meadow Jumping Mouse		Meadow Vole		Red-backed Vole		Unknown	Site Total	
	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2009	2008	2008	2009
Ann Marie Lake	4	-	-	-	-	-	-	-	-	-	-	-	130	1	2	134	1
Churchill Falls	-	-	-	-	1	-	1	-	-	-	-	-	27	4	-	29	4
English River	1	N/A	-	N/A	-	N/A	3	N/A	-	N/A	-	N/A	10	N/A	-	14	N/A
Forkin Bridge Road	-	-	-	-	-	-	6	-	-	-	-	-	19	9	-	25	9
Innu South Side	3	-	-	-	-	-	5	1	-	-	-	-	70	8	4	78	9
Nain	-	1	5	-	-	-	-	-	-	-	-	-	-	-	-	5	1
Park Lake	7	-	-	-	2	-	-	-	-	-	-	-	41	6	5	50	6
Ship Harbour Head	-	-	-	-	-	-	-	1	7	-	4	1	1	-	-	12	2
Trans Lab Highway	-	-	-	-	-	-	-	-	1	-	-	-	-	4	-	1	4
Voisey's Bay	-	N/A	-	N/A	-	N/A	1	N/A	-	N/A	-	N/A	6	N/A	-	7	N/A
Species Total	15	1	5	-	3	-	16	2	8	-	4	1	304	32	11	365	36