

# WESTERN NEWFOUNDLAND MODEL FOREST

## METHODS OF INSECT COLLECTION REPORT

PROJECT NUMBER 8-401

Prepared for: Mr. BOB MERCER  
MANAGER  
WESTERN NEWFOUNDLAND MODEL FOREST

Prepared by: STAN PIEDA  
PUBLIC AWARENESS PROJECT

October 5, 1994

Original Report  
For / By Western NF  
Model Forest

**TABLE OF CONTENTS**

REPORT.....	1
MAP OF TRAP LOCATIONS.....	3
TRAP LOCATION DESCRIPTION.....	4
TRAP SURVEY SHEETS:	
-Pheromone Trap.....	5
-Pitfall Trap.....	6
-Yellow Pan # 1.....	7
-Yellow Pan # 2.....	9
-Yellow Pan # 3.....	11
-Yellow Pan # 4.....	13
-Yellow Pan # 5.....	15
-Malaise Trap.....	16
APPENDIX.....	

METHODS OF INSECT COLLECTION REPORT

This project #8-401 was started the first week of July. Its collaborators are the Westviking College, the Newfoundland Insectarium, the NRCan Forest Insect and Disease Survey and the NRCan Semiochemical Working Group. The following NRCan Forest Insect and Disease Survey employees provided assistance. Mr. R. West filed an insect supplies list and with Mr. K. Pardy issued a "Methods of Insect Collection" hand out. Mr. D. Stone set up the field traps, provided information and furnished the pheromone trap. Mr. Lloyd Hollett of the Newfoundland Insectarium lent a Malaise trap and identified some insect samples. The insect traps and supplies arrived on July 8 and on July 14 all the traps were in place except the Malaise trap which was put up on July 22.

During the board room meetings our tour guests had an opportunity to see my display of Western Newfoundland insects and furthermore the sweep net, beating sheet traps, black light trap and aspirator trap were demonstrated. The pheromone trap, pit fall trap, Malaise trap, and yellow pan traps were incorporated into the interpretation of bus tour stop #1, the brook side stop at the N.E. end of Stag Lake and at stop #4. The yellow pan trap at stop #4 disappeared after a few days on site. I kept a sweep net in our tour bus and caught butterflies, flies, damsel flies and dragon flies so that our guests could appreciate large live insects which were later released. The visitors were quite inquisitive about the traps and enjoyed seeing insect research in action, though on a display level.

Weekly forays were made from July 20 to August 27 to maintain

the traps and collect dry samples for mounting. Some insects, especially the ones from the Malaise trap will become part of the Westviking College entomology collection. The labour was in kind.

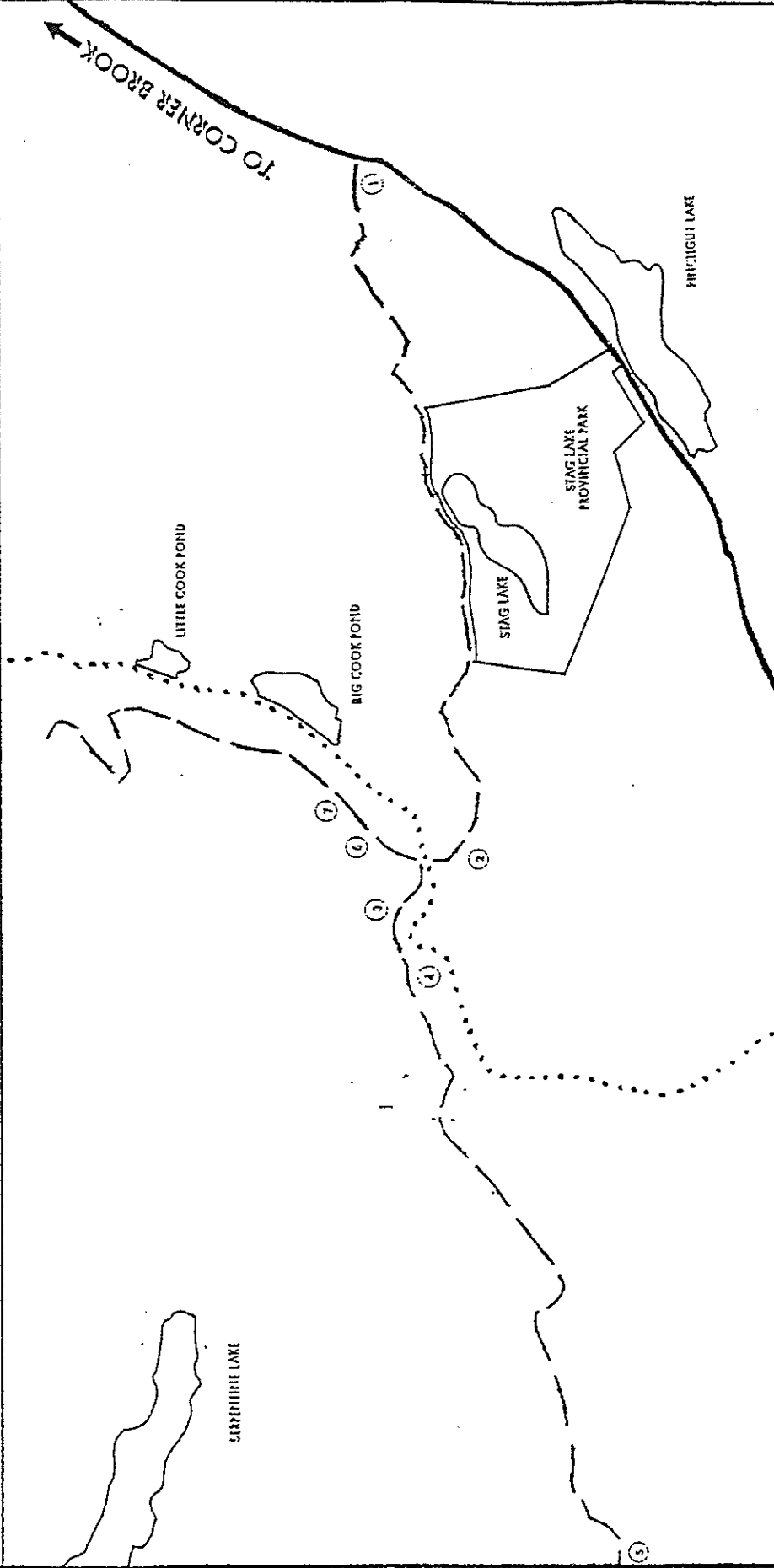
A teashirt prize was offered weekly for ten weeks. It was inscribed with the Western Newfoundland Model Forest logo and a "Lady Bug" picture.

The total cost for traps and supplies was \$ 881.58. All these items were donated and delivered to Mr. Lloyd Hollett of the Newfoundland Insectarium.

Included is a map and information on trap locations and tables of common names of insects and invertebrates sampled.

This project was a successful addition to our nature tour. I recommend that it be repeated next year.

# WESTERN NEWFOUNDLAND MODEL FOREST BUS TOUR STOPS



## LEGEND

	LOGGERS SCHOOL ROAD		BUS STOP
			TRANS CANADA HIGHWAY
	LOGGERS SCHOOL ROAD	SCALE 1:100,000	
	CNR RAILBED	 TRUE NORTH	

WESTERN NEWFOUNDLAND MODEL FOREST INC. PROJECT NO.: 8-401 TRAP LOCATION DESCRIPTION	
TRAP	LOCATION
Pheromone	-Bus Stop #1 -Mature balsam fir forest -Tied to branch 6' high
Pit Fall	-Bus Stop #1 -Mature balsam fir forest floor and baited with apple peels
Yellow Pan #1	-Bus Stop #1 -Mature balsam fir forest floor and baited with soapy water
Yellow Pan #2	-Same as above except located on a boulder
Yellow Pan #3	-Same as above except located at forest edge near Loggers School Road
Yellow Pan #4	-Near the N.E. end of Stag Lake and Loggers School Road where a brook crosses the road
Yellow Pan #5	-Bus Stop #4 -Wetland shore





WESTERN NEWFOUNDLAND MODEL FOREST INC.  
PROJECT NO: 8-401  
INSECT/INVERTEBRATE SURVEY SHEET 3 of 14

TRAP: YELLOW PAN #1

DATE	ORDER	COMMON NAME	QUANTITY
20/07/94		Slug	1
	Diptera	Fly spp	10
		Crane Fly	6
28/07/94		Caterpillar	3
		Slug	4
	Diptera	House Fly	10
		Blow Fly	2
		Crane Fly	8
		Mosquito	12
		Black Fly	5
		Fly spp	15
07/08/94		Slug	3
	Coleoptera	Carrion Beetle	3
	Collembola	Springtail	15
	Diptera	Blow Fly	4
		Dung Fly	3
14/08/94		Slug	6
	Coleoptera	Rove Beetle	2
		Carrion Beetle	1
	Diptera	Long-legged Fly	7
		Housefly	10
	Collembola	Springtail	18
21/08/94		Slug	6



WESTERN NEWFOUNDLAND MODEL FOREST INC.  
PROJECT NO: 8-401  
INSECT/INVERTEBRATE SURVEY SHEET 5 of 14

TRAP: YELLOW PAN #2

DATE	ORDER	COMMON NAME	QUANTITY
20/07/94		Slug	1
	Diptera	Fly spp	8
28/07/94		Slug	2
	Collembola	Springtail	35
	Diptera	House Fly	3
		Crane Fly	2
		Long-legged Fly	1
		Dung Fly	1
		Black Fly	5
		Fly spp	6
07/08/94		Slug	2
	Coleoptera	Carrion Beetle	1
	Collembola	Springtail	6
	Diptera	Black Fly	1
		Blow Fly	3
		Dung Fly	2
		Fly spp	12
14/08/94		Earthworm	
		Caterpillar	
	Collembola	Springtail	100
	Diptera	House Fly	6
		Long-legged Fly	3
		Fly spp	10



WESTERN NEWFOUNDLAND MODEL FOREST INC.  
PROJECT NO: 8-401  
INSECT/INVERTEBRATE SURVEY SHEET 7 of 14

TRAP: YELLOW PAN #3

DATE	ORDER	COMMON NAME	QUANTITY
20/07/94		Spider	1
	Collembola	Springtail	4
	Diptera	Crane Fly	6
		Long-legged Fly	2
		Black Fly	3
		Blow Fly	2
28/07/94		Caterpillar	9
		Snail	1
		Slug	2
		Earthworm	1
	Collembola	Springtail	1
	Diptera	House Fly	2
		Crane Fly	1
		Mosquito	1
		Black Fly	2
07/08/94		Disturbed	0
14/08/94		Caterpillar	2
		Slug	1
	Diptera	Black Flies	40
		House Fly	1
		Mosquito	1
Long-legged Fly		1	



WESTERN NEWFOUNDLAND MODEL FOREST INC.  
PROJECT NO: 8-401  
INSECT/INVERTEBRATE SURVEY SHEET 9 of 14

TRAP: YELLOW PAN #4

DATE	ORDER	COMMON NAME	QUANTITY
20/07/94		Slug	4
	Diptera	Black Fly	3
		Crane Fly	2
		Mosquito	1
		Fly spp	6
	Hymenoptera	Black Ant	3
	Coleoptera	Ground Beetle	1
28/07/94		Centipede	2
		Earthworm	1
		Slug	1
		Caterpillar	1
	Diptera	Horse Fly	2
	Coleoptera	Ground Beetle	1
	Hymenoptera	Black Ant	1
	Homoptera	Leafhopper	1
07/08/94		Slug	4
	Diptera	Hover Fly	6
		Blow Fly	5
		Crane Fly	7
		Marsh Fly	4
		Lepidoptera	Moth spp
	Collembola	Springtail	2
	Homoptera	Leafhopper	1
	Hymenoptera	Black Ant	1
Yellow Jacket		1	

WESTERN NEWFOUNDLAND MODEL FOREST INC.  
PROJECT NO: 8-401  
INSECT/INVERTEBRATE SURVEY SHEET 10 of 14

TRAP: YELLOW PAN #4

DATE	ORDER	COMMON NAME	QUANTITY	
14/08/94		Centipede	1	
		Slug	3	
	Diptera		Blow Fly	1
			House Fly	1
			Long-legged Fly	10
			Fly spp	40
	Collembola	Springtail	10	
	Lepidoptera	Spruce Budworm Moth	1	
	Coleoptera	Ground Beetle	4	
21/08/94		Wood Frog	1	
		Caterpillar	2	
		Slug	3	
	Coleoptera	Ground Beetle	1	
	Hemiptera	Tarnished Plant Bug	3	
	Tricoptera	Caddisfly	1	
	Hymenoptera		Black Ant	2
			Ichneumon Wasp	1
Diptera	Marsh Fly	3		
27/08/94		Earthworm	1	
		Caterpillar	3	
	Hymenoptera	Black Ant	3	
	Diptera		Long-legged Fly	1
			Crane Fly	2
			Midge	8
			House Fly	1



WESTERN NEWFOUNDLAND MODEL FOREST INC.  
PROJECT NO: 8-401  
INSECT/INVERTEBRATE SURVEY SHEET 12 of 14

TRAP: MALAISE

DATE	ORDER	COMMON NAME	QUANTITY
28/07/94	Coleoptera	Fire Coloured Beetle	1
		Long Horned Beetle	1
	Collembola	Springtail	38
	Hymenoptera	Ichneumon Wasp	38
	Lepidoptera	Spruce Budworm Moth	15
	Diptera	Crane Fly	13
		Black Fly	2
		Blow Fly	4
		Hover Fly	2
		Dung Fly	2
		Horse Fly	2
		Flesh Fly	2
		Fly spp	40
07/08/94	Coleoptera	Click Beetle	1
		Carrion Beetle	3
		Elderberry Borer	1
	Diptera	Crane Fly	4
		Hover Fly	3
		Blow Fly	2
		Flesh Fly	8
		Dung Fly	11
		Long-legged Fly	3
		Fly spp	>50
	Tricoptera	Caddisfly	1
	Hymenoptera	Ichneumon etc. wasp	40
	Lepidoptera	Moth spp	10

WESTERN NEWFOUNDLAND MODEL FOREST INC.  
PROJECT NO: 8-401  
INSECT/INVERTEBRATE SURVEY SHEET 13 of 14

TRAP: MALAISE

DATE	ORDER	COMMON NAME	QUANTITY
14/08/94	Diptera	Hover Fly	4
		Deer Fly	1
		Blow Fly	9
		Black Fly	20
		Mosquito	6
		Gall Midge	1
		Fly spp	>50
	Hymenoptera	Sawfly	50
		Ichneumon etc. Wasp	30
	Coleoptera	Bark Beetle	4
		Rove Beetle	1
		Wood Boring Beetle	2
	Homoptera	Tarnished Plant Bug	2
Tricoptera	Caddisfly	2	
21/08/94	Lepidoptera	Moth spp	3
		Hook Wing Moth	2
	Diptera	Hover Fly	2
		Blow Fly	5
		Flesh Fly	22
		Dung Fly	13
		Marsh Fly	14
		Fly spp	30
	Homoptera	Leafhopper	1
	Coleoptera	Wood Boring Beetle	2
	Hemiptera	Tarnished Plant Bug	2
Hymenoptera	Ichneumon etc. Wasp	50	



A P P E N D I X

# Methods of Insect Collection

R.J. West and K.E. Pardy  
NRCan, Canadian Forest Service  
Box 6028, St. John's, Newfoundland A1C 5X8

Insects are the most numerous organisms on the face of the earth. As they are found in every imaginable habitat, a variety of collecting equipment and methods is required to properly measure biodiversity, especially in a forest where so many microhabitats are available. The collection devices are designed to be effective and to preserve insects in a natural, undamaged and undistorted condition that allows for later identification. Some of the more common collection methods are described below.

## Sweep Net

Sweep nets are used to capture a particular flying insect such as an attractive butterfly but also are useful to obtain insects on vegetation like grasses and flowers. Pollinating insects are often captured with this method.

## Beating Sheet

Beating sheets of various sizes are used to obtain insects dislodged from a tree or other vegetation by beating with a stick. This method is used to quickly estimate densities of damaging caterpillars in coniferous forests.

## Malaise Trap

This tentlike trap takes advantage of the tendency of day-flying insects to move toward light and upwards upon striking a barrier. It is open at the front side and has a sloped roof leading to a container with a killing bottle at its peak. The insects fly through the entrance, crawl up the sides of the trap and crawl into the container where they are killed and later retrieved.

## Pitfall Trap

Pitfall traps are simple containers (can, beer cup, etc) or more elaborate devices (eg., funnels) sunk into the ground with the top of the open end level with the ground surface. The traps may contain fluid preservatives or be left dry if live specimens are desired for counting or for more selective collections. Traps may be baited with rotting fruit, flowers, fermenting sap or other substances attractive to certain insects.

### Pan Trap

The pan trap is an open pitfall trap that contains water. Crawling insects such as beetles and flying insects that land on the water surface are captured. Soap detergent is usually added to the water to change the surface tension so that the insects sink and drown. The bottom surface of the trap is often painted yellow, a colour attractive to flying insects. Pan traps need to be checked every few days, before insects deteriorate.

### Black Light Trap

Night-flying insects are strongly attracted to artificial light, particularly in wavelengths near the ultraviolet range. Putting a black light in front of a vertically placed white sheet will attract a large number of insects that can be selectively picked from the sheet. A bucket can also be used with the black light to trap insects throughout the night.

### Pheromone Trap

Many female insects produce perfumes or 'pheromones' that are attractive to males of the same species. Males detect the pheromone with their antennae and fly to the female to mate. Scientists have identified the chemical structure of many of the moth pheromones and have synthesized them for trapping purposes. The pheromone trap consists of a cardboard or plastic trap containing a rubber lure impregnated with the pheromone. Although pheromones are very specific, non-target insects sometimes are captured. Varying the openings to the trap contributes to a more selective catch. Statistics on the number of males caught in pheromone traps help to determine damage by defoliating insects in the following year.

---

### **Suggested reading:**

- Biological Survey of Canada (Terrestrial Arthropods), 1994. Terrestrial arthropod biodiversity: planning a study and recommended sampling techniques. Bulletin of the Entomological Society of Canada, Vol. 26 (March).
- Martin, J.E.H. (compiler), 1977. The Insects and Arachnids of Canada, Part I. Collecting, Preparing and Preserving Insects, Mites and Spiders. Agriculture Canada Misc. Publ. 1643. 182 pp.