

An arthropod survey of a transmission line right of way at Greenwoods Conservancy, summer 1999

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INTRODUCTION

The Greenwood Conservancy consists of a 1,000+-acre nature preserve in the Town of Burlington that is protected in perpetuity under conservation easements through the Otsego Land Trust. The NY Power Authority has a Transmission Line right-of-way (ROW) maintained at Greenwoods that is the focus of this study. The ROW within Greenwoods Conservancy was surveyed for species richness of terrestrial arthropods in the summer of 1999. This work was conducted to show initial species richness located at the ROW that may be used to evaluate how ROW maintenance practices affect arthropod communities. The Power Authority can use such data for beneficial ecological changes brought on by their management practices on ROWs. This work is concurrent with vegetative studies (Austin, 2000; Adams, 2000; Groff, 2000) and vertebrate studies (Phillips, 2000) along the ROW.

METHODS AND MATERIALS

A total of 15 samples were taken from 7 locations within the ROW 22 June, 1999 (Figure 1). The remaining terrestrial invertebrates were collected along two perpendicular belt transects to the ROW. Belt transect A consisted of a stable shrub community with selective tree cutting by the Power Authority. Belt transect B had been clear-cut within the last 12 months and showed primarily an immature shrub community. Each belt transect contained 3 sites. Sample sites were chosen to show a representative microhabitat within the belt transect to include an edge, high shrub (over 2 meters) or a low shrub (under 2 meters) area. Three night samples were conducted with the use of two light traps placed at each belt transects edge and one at the red trail between the transects.

Soil arthropods were examined by using a series of 10 cm X 10 cm X 10 cm soil samples that were collected and filtered with the use of a Berlese funnel for 72 hours to help separate the arthropods from the soil (Brewer and McCann, 1982). Specimens were filtered into a 70% ethanol preserving solution. Sweeping nets were utilized to collect aerial arthropods during the day (Brower and Zar, 1984). The final sampling method for day trapping used a Malaise trap located at red trail between the belts to collect biting insects. Bait that consisted of chopped meat was used to attract flying insects. The trap was left on site for 6 hours. For night sampling, two types of light traps were employed to collect night flying insects at each belt transect and the red trail. For the red trail, a beating net was hung between two trees with a light placed behind it to collect large flying insects. A mechanical light trap was placed at each belt transect and left over night. All aerial samples were collected and killed with the use of ethyl acetate in the field. All samples were then transported to the BFS and preserved with 70% ethanol

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solution. Arthropod specimens were keyed to Family and were archived to allow for future taxonomic definition (Arnett 1993; Borror *et al.*, 1989; Opler, 1998; White, 1983; Borror and White, 1970; Milne and Milne, 1998; Kaston, 1971).

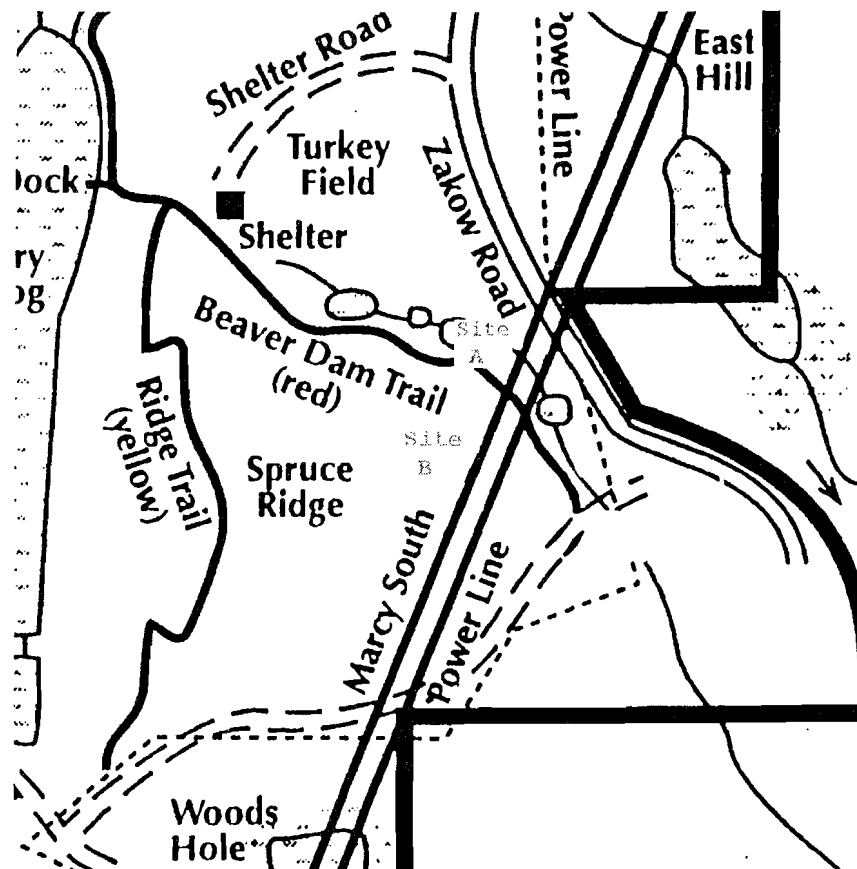


Figure 1. Site location for sample collecting at Greenwood Conservancy. Site A contained location 1-3 of Samples A. Site B contained locations 4-6 of sample B and, Beaver Dam Trail contained location 7 between Site A and Site B.

RESULTS AND DISCUSSION

Table 1 provides a taxonomic listing of all terrestrial arthropods collected in this study. A total of 297 specimens were collected representing 14 Orders and 66 Families. Table 2 provides a taxonomic list of terrestrial arthropods by sample site and quantity located at the site. Belt transect (A) showed a greater species richness than B. Edge sample sites showed more species richness and higher population densities than the other types of microhabitats. Soil samples did not yield a large quantity of specimens and might require larger soil samples to more adequately evaluate species richness.

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Table 1. Taxonomic listing of all terrestrial arthropods collected at Greenwood Conservancy Right of Way Transmission line.

Order	Family	Sub-Family	Group	Species
Lithobiomorpha				
Pseudoscorpiones	Chernetidae			
Opiliones	Phalangiidae			
Odonata	Libellulidae Coenagrionidae			
Orthoptera	Acrididae Tettigoniidae			
Plecoptera	Perlodidae			
Hemiptera	Miridae Pentatomidae			
Homoptera	Cicadidae Membracidae Cicadellidae Cercopidae Aphididae Issidae			
Coleoptera	Carabidae Silphidae Staphylinidae Elateroidea Lycidae Lampyridae Cantharidae Coccinellidae Cerambycidae			<i>D. palliatus</i>

Order	Family	Sub-Family	Group	Species
Coleoptera (cont.)	Chrysomelidae Curculionidae			
Strepsiptera	Mengeidae			
Diptera	Tipulidae Mycetophilidae Sciardae Culicidae Ceratomyiidae Chironomidae Tabanidae Asilidae Dolichopidae Syrphidae Agromyzidae Sciomyzidae Sepsidae Lauxaniidae Heleomyzidae Anthomiidae Muscidae Calliphoridae Scathophagidae Sarcophagidae Tachinidae		Chrysops	
Trichoptera	Phrypaneidae			
Lepidoptera	Pterophoridae Hesperiidae Pyralidae Papilionidae Pieridae Lycaenidae Arctiidae	Lycaeninae Arctilinae		<i>P. Canadensis</i>

<u>Order</u>	<u>Family</u>	<u>Sub-Family</u>	<u>Group</u>	<u>Species</u>
Hymenoptera	Gasteroptiidae			
	Ichneumonidae			
	Chalcidoidea			
	Halicitidae			
	Diapriidae			
	Andrenidae			
	Anthophoridae ²	Anthophorinae		
	Apidae	Bombinae		
	Formicidae			

² Parasitic insect (O. - Strepsiptera F.-Mengeidae) located on specimen

Table 2. Taxonomic List of Terrestrial Arthropods by Sample Site and Qauntities.

Location	Order	Family	Quantity
A1	Opiliones	Phalangiidae	3
	Orthoptera	Acridae	1
	Homoptera	Cicadidae	1
		Cercopidea	1
	Coleoptera	Elateroidea	1
		Chrysomelidae	1
		Curculionidae	4
	Diptera	Muscidea	1
	Unkown		2
A2	Pseudoscorpiones	Chernetidae	1
	Odonata	Coenagrionidea	1
	Orthoptera	Acrididae	1
	Hemiptera	Miridae	4
	Homoptera	Cercopidea	1
	Coleoptera	Staphylinidae	1
		Elateridae	2
		Cantharoidea	5
	Diptera	Syrphidae	2
		Sepsidea	1
		Anthomiidae	1
	Lepidoptera	Arctiidae	1
	Hymenoptera	Halictidae	1
		Diapriidae	1
		Formicidae	6
	Unkown		21

Location	Order	Family	Quantity
A3			
	Odonta	Coenagrionidae	6
	Plecoptera	Perlodidae	1
	Hemiptera	Miridae	5
	Homoptera	Cicadellidae	2
		Cercopidae	15
		Issidae	1
	Coleoptera	Silphidae	1
		Cantharidae	5
		Curculionidae	2
	Diptera	Tipulidae	2
		Tabanidae	2
		Asilidae	1
		Syrphidae	2
		Sciomyzidae	1
		Scathophagidae	2
	Hymenoptera	Halicitidae	1
	Unknown		4
B1			
	Opiliones	Phalangidae	1
	Homoptera	Cicadidae	1
	Coleoptera	Lampyridae	1
		Cantharidae	1
		Coccinellidae	1
		Curculionidae	1
	Diptera	Muscidae	2
		Scathophagidae	1
	Lepidoptera	Pterophoridae	1
	Unknown		6

Location	Order	Family	Quantity	
B2	Odonata	Coenagrionidae	1	
		Hemiptera	Pentatomidae	1
	Homoptera		Cicadidae	2
		Aphididae	1	
	Coleoptera	Carabidae	1	
		Cerambycidae	1	
	Diptera	Sciaridae	1	
		Tabanidae	4	
		Agromyzidae	1	
		Tachinidae	1	
	Hymenoptera	Formicidae	2	
	Unknown		2	
	B3	Homoptera	Membracidae	1
			Coleoptera	Lampyridae
Cerambycidae		1		
Diptera		Tabanidae	1	
		Muscidae	1	
Lepidoptera		Papilionidae	1	
Hymenoptera		Andrenidae	1	
Unknown			2	
DC		Opiliones	Phalangidae	1
			Coleoptera	Lampyridae
	Diptera	Culicidae		8
		Chironomidae	3	
		Sarcophagidae	3	

Location	Order	Family	Quantity
DC	Lepidoptera	Pieridae	1
		Lycaenidae	1
		Arctiidae	1
	Hymenoptera	Formicidae	1
	Unknown		1
LT	Coleoptera	Lycidae	1
		Curculionidae	1
	Diptera	Tipulidae	6
		Mycetophilidae	2
		Culicidae	4
		Cecidomyiidae	18
		Chironomidae	2
		Dolichopodidae	3
		Lauxaniidae	1
	Trichoptera	Phrypaneidae	1
	Lepidoptera	Hesperiidae	1
		Pyralidae	2
		Pieridae	6
	Hymenoptera	Ichneumonidae	3
		Chalcidoidea	1
	Unknown		3
	MT	Odonata	Libellulidae
Orthoptera		Tettigoniidae	1
		Hemiptera	Miridae
Strepsiptera		Mengeidae	10+
Diptera		Tabanidae	9
		Asilidae	2
		Dolichopidae	2
		Syrphidae	1

Location	Order	Family	Quantity
MT			
	Diptera		
		Callphoridae	1
		Sarcophagidae	2
		Tachinidae	1
	Lepidoptera		
		Hesperiidae	6
		Pyralidae	4
		Papilionidae	2
	Hymenoptera		
		Gasteroptiidae	2
		Ichneumonidae	1
		Halictidae	2
		Andrenidae	1
		Anthoporidae	3
		Apidae	1
		Formicidae	1

Note - Location A1,A2, and A3 are located at Site A.

Location B1, B2, and B3 are located at Site B.

Location LT (light trap) and MT (malaise trap) are located on Beaver Dam Trail between Site A and B on the Right of Way.