CANAAN VALLEY NWR
U. S. FISH AND WILDLIFE SERVICE
MEMORANDUM

DATE: July 30, 2009

TO: File

FROM: Emily Jones

SUBJECT: Balsam Fir Wooly Adlegid Survey on CVNWR

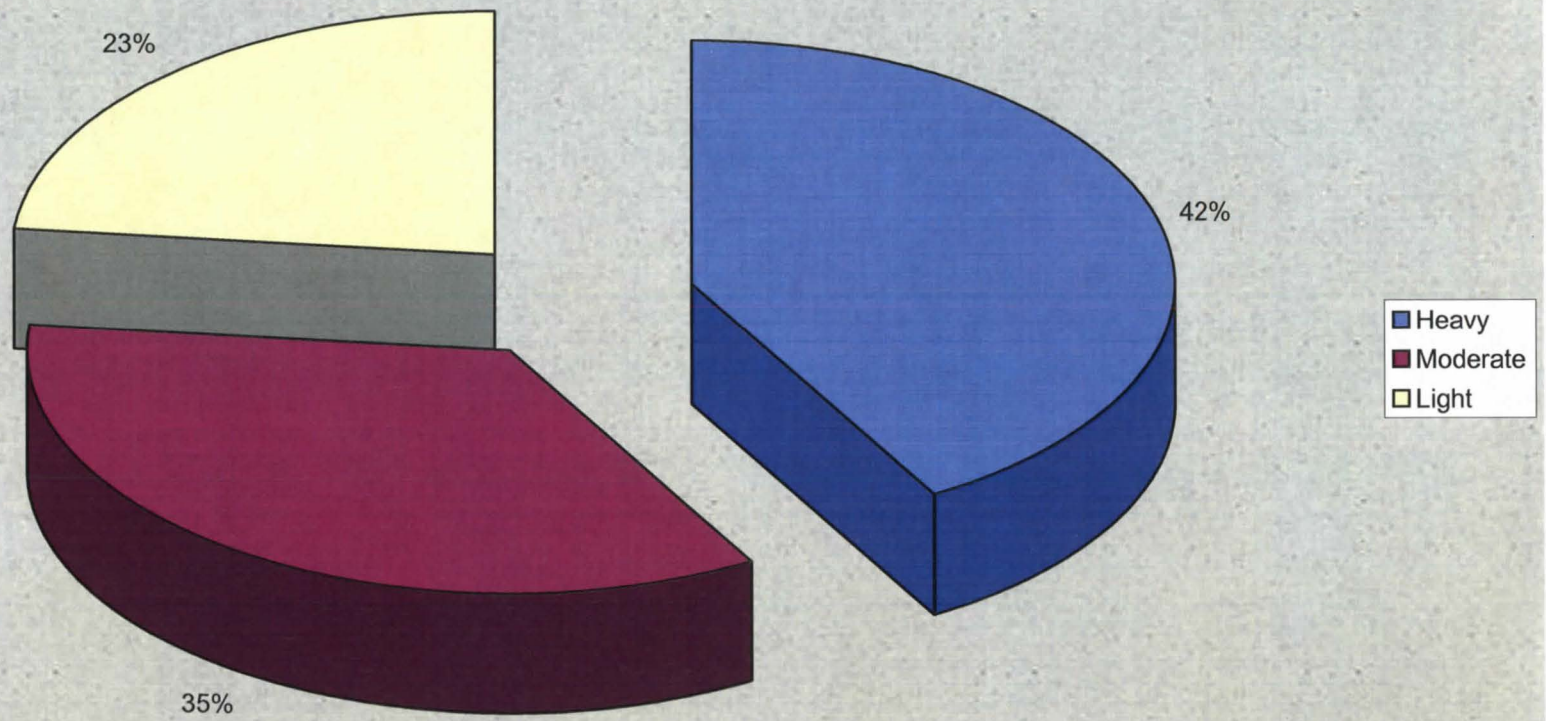
On July 17, 2009 Amber Myers and I conducted a survey to check the status of Balsam Fir Wooly Adelgid on one hundred Balsam Fir Trees off of Freeland Trail. We searched the bark and limbs for the actual pest and the twigs for other symptoms like tip curling and gouting. We used a scale to determine wether they were lightly, moderately, or heavily infested. Light = 0-5, Moderate = 5-50 and Heavy = over 50. Not only did we search for signs that the trees were affected by this; we also measured the diameter of each tree to test a theory that the younger trees are not as likely to become victims. After each check we flagged the tree to be positive that we didn't do the survey twice to one tree. Here are our results:

BWA Infestation	Num of Trees
Heavy	25
Moderate	21
Light	14

Total Number of trees infested : 60
42% Heavy
35% Moderate
23% Light

	DBH AVG CM
AVG DBH total	14.95
AVG DBH Heavy	18.88
AVG DBH Moderate	23.27368421
AVG DBH Light	14.07857143

Balsam Wooly Aldegid Infestation - Freeland Tract 7/15/2009



Total Number of Trees Infested =

60

Balsam Fir Wooly Adegid Survey
Freeland Tract - Main Stand
Date: 7/15/2009
Conducted by: Amber Myers and Emily Jones

D. B. = Dead Branches

Tree#	dbh (cm)	Bark	Twig	Gouting	D. B.	other critters/comments
1	11.7	no	no	no	no	lichens
2	11.2	no	no	yes	yes	
3	10.3	no	no	no	yes	
4	4.4	no	no	no	yes	
5	4.5	no	no	no	no	some new growth distorted
6	6.5	no	no	no	no	tip curling
7	4	no	no	no	yes	
8	8.8	no	no	no	yes	tip curling
9	12.8	light	no	no	yes	FRE 7
10	9.6	light	no	no	yes	almost completely dead; FRE 6
11	7.3	no	no	no	yes	tip curling; FRE 5
12	8.5	no	no	no	yes	almost completely dead
13	8.9	no	no	no	yes	
14	15	heavy	no	no	yes	some distorted branches
15	8.9	light	no	no	yes	tip curling; FRE9
16	4.6	no	no	no	yes	tip curling
17	13.3	heavy	yes	no	yes	tip curling
18	13.3	heavy	no	no	yes	
19	8.8	light	no	no	yes	
20	14	heavy	no	no	yes	
21	6.9	light	no	no	yes	
22	2.9	no	no	no	yes	some distorted branches
23	23	moderate	yes	no	yes	tip curling
24	21.8	heavy	no	yes	yes	tip curling
25	26.4	moderate	no	no	yes	tip curling
26	8.9	no	no	no	yes	tip curling
27	19.8	moderate	no	no	yes	tip curling
28	23.9	heavy	no	no	yes	tip curling
29	12.1	heavy	no	no	yes	85
30	36.6	moderate	yes	no	yes	tip curling
31	19.7	moderate	yes	no	yes	tip curling
32	21.2	heavy	yes	yes	yes	tip curling
33	24.2	heavy	no	yes	yes	tip curling
34	24.9	moderate	no	no	yes	
35	4.4	no	no	yes	yes	tip curling
36	15.2	heavy	no	no	yes	
37	17.3	moderate	no	no	yes	
38	11.3	light	no	no	yes	tip curling
39	10.7	no	no	no	yes	
40	9.2	no	no	no	no	
41	8.8	no	no	no	no	
42	11.4	no	no	no	no	
43	8.9	no	no	no	yes	
44	14.2	moderate	no	no	yes	dead on bottom
45	9	no	no	no	yes	tip curling

46	2.6	no	no	no	yes	dead on bottom
47	14.5	heavy	yes	yes	yes	tip curling
48	13.8	light	no	no	yes	
49	5.3	no	no	no	yes	dead on bottom
50	25	moderate	yes	no	yes	tip curling; FRE 1
51	19.5	heavy	yes	yes	yes	tri-tree
52	17.5	light	no	no	no	tip curling
53	12	light	no	no	yes	
54	21.7	heavy	no	no	yes	tip curling
55	12.5	moderate	yes	no	yes	tip curling
56	25	moderate	no	no	yes	almost completely dead
57	27	moderate	no	no	yes	tip curling
58	1	no	no	no	no	tip curling
59	21	heavy	no	yes	yes	tip curling
60	15.4	heavy	yes	no	yes	tip curling
61	13.1	no	no	no	yes	
62	2.6	no	no	no	yes	
63	9.6	no	no	no	no	
64	12	no	no	no	yes	
65	10.5	no	no	no	yes	
66	29.2	moderate	no	yes	yes	tip curling
67	2.5	no	no	no	no	
68	4	no	no	no	no	tip curling
69	28	moderate	yes	yes	yes	tip curling
70	29	moderate	yes	no	yes	tip curling, completely enclosed by spirea
71	29.7	heavy	yes	no	yes	
72	28.2	heavy	yes	no	yes	
73	23	heavy	yes	yes	yes	
74	17.3	heavy	no	no	yes	almost completely dead
75	21	heavy	no	no	yes	
76	20.3	no	no	no	yes	dead; 89
77	18.5	heavy	no	no	yes	tip curling
78	13.5	light	no	no	yes	
79	32.6	light	no	no	yes	almost completely dead
80	13.8	no	no	no	yes	dead
81	19.4	heavy	no	no	yes	
82	29.9	moderate	no	no	yes	
83	18.1	moderate	no	no	yes	
84	19.7	light	no	no	yes	almost completely dead
85	16.7	light	no	no	yes	
86	26.9	moderate	no	no	yes	almost completely dead
87	27	moderate	no	no	yes	
88	22.8	no	no	no	yes	dead; 171
89	11.1	heavy	no	no	yes	
90	14.2	heavy	no	no	yes	tip curling
91	10.4	no	no	no	yes	
92	6.8	no	no	no	no	
93	13	light	no	no	yes	
94	11.8	moderate	yes	no	yes	tip curling
95	3.4	no	no	no	no	
96	2.7	no	no	no	yes	
97	23.5	heavy	yes	no	yes	

98	10.3	no	no	no	yes	
99	11.1	no	no	no	no	
100	24.9	moderate	yes	yes	no	away from enclosure

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	DBH AVG CM
AVG DBH total	14.95
AVG DBH Heavy	18.88
AVG DBH Moderate	23.27368421
AVG DBH Light	14.07857143

Light = 0-5
Moderate = 5-50
Heavy = over 50

BALSAM WOOLY ADELGID SURVEY

DATE 7/15/2009 STAND: Freeland Tract

Amber Myers & Emily Jones

Tree #	dbh	Bark	Twig	Gouting	Dead Branches	other critters/comments
1	11.7	No	No	No	No	lichens, sap bubbles, not dead branches
2	11.2	No	No	Yes	yes	generally stressed, bottom sap bubbles, lichen
3	10.3	No	No	No	yes	
4	4.4	No	No	No	ys	
5	4.5	No	No	No	No	Some new growth was distorted, stunted/brown leaves on trunk
6	6.5	No	maybe (light)	No	No	tip curling
7	4	No	No	No	Yes	
8	8.8	No	No	No	yes	tip curling
9	12.8	Yes L	maybe (red egg)	No	Yes (mostly)	dark dried area FRE 7
10	9.6	Yes L	No	No	Yes	almost completely dead FRE 6
11	7.3	No	No	No	Yes	mostly dead tip curling FRE 5
12	8.5	No	No	No	Yes	mostly dead
13	8.9	No	No	No	Yes	
14	15	Yes H	No	No	Yes	some distorted branches
15	8.9	Yes L (looked old)	No	No	Yes	tip curling FRE 9
16	4.6	No	No	No	Yes	tip curling
17	13.3	Yes H	Yes (but very close to trunk)	No	yes	tip curling
18	13.3	Yes H	No	No	Yes	
19	8.8	Yes L	No	No	Yes mostly	
20	14	Yes H	No	No	Yes	
21	6.9	Yes L	No	No	Yes mostly	
22	2.9	No	No	No	Yes	Needles are irregular short in some places 485 non consistent
23	23	Yes M	Yes (close to trunk)	No	Yes	tip curling

BALSAM WOOLY ADELGID
SURVEY

DATE 7/15/2004 STAND: Freeland Tract

Tree #	dbh	Bark	Twig	Gouting	Dead Branches	other critters/comments
24	21.8	Yes H	No	Yes	Yes about half	tip curling
25	26.4	Yes M	No	No	Yes	heavy lichen tip curling
26	8.9	No	No	No	Yes	tip curling
27	19.8	Yes M	No	No	yes	tip curling
28	23.9	Yes VH	No	No	Yes	tip curling
29	12.1	Yes VH	No	No	Yes	> adjacent
30	36.6	Yes M	Yes close to trunk	No	Yes	tip curling
31	19.7	Yes M	Yes	No	Yes	tip curling
32	21.2	Yes VH	Yes	may be very little	Yes	tip curling
33	24.2	Yes VH	No	Yes	Yes	tip curling
34	24.9	Yes M	No	No	Yes	
35	4.4	No	No	Yes	Yes very dead	tip curl
36	15.2	Yes H	No	No	Yes	
37	17.3	Yes M	No	No	yes	
38	11.3	Yes L	No	No	Yes mostly	tip curl
39	10.7	No	No	No	Yes	
40	9.2	No	No	No	slightly	
41	8.8	No	No	No	No	
42	11.4	No	No	No	No	
43	8.9	No	No	No	Yes	
44	14.2	Yes M	No	No	yes	dead on bottom
45	9.0	No	No	No	Yes	tip curl
46	2.0	No	No	No	Yes	top shaded out dead bottom dead

BALSAM WOOLY ADELGID
SURVEY

DATE 7/15/2009 STAND: freeland Tract

Tree #	dbh	Bark	Twig	Gouting	Dead Branches	other critters/comments
47	14.5	yes-h	yes Minimally	yes-h	yes	tipcurl
48	13.8	yes-L	NO	NO	yes bottom	
49	5.3	NO	NO	NO	yes	dead or [illegible] from
50	25.0	yes-M	yes-TONS HIGH incidence thick bark	No	yes bottom.	Tipcurl
51	19.5	yes-VH	yes top and underside adjacent	Yes.	yes some bottom	TRI-TREE
52	17.5	yes-L	No-	No.	No.	Tipcurl
53	12.0	yes-L	NO	No	Yes	
54	21.7	Yes-H	No	No	Yes-Minimal	tipcurl
55	12.5	Yes-M	Yes	No	Yes-Minimal	tipcurl
56	25.0	yes-M	No	No	yes	barely alive until top
57	27.0	yes-M	No.	No	Yes	tipcurl
58	1.0	NO-	NO	No	1 dead branch (discolored, not dead)	TipCurl
59	21.0	yes-H	NO	Yes	yes	tip curl
60	15.4	yes-H	Yes in between branch scars	No	yes	Tip curl
61	13.1	No	No	No	Yes discolor	isolated tree position
62	2.6	No	No	No	yes, discolor	isolated w 63
63	9.6	No	No	No	No	isolated w 62
64	12.0	NO.	NO	N.O	yes, barely	isolated w 65
65	10.5	No	No	No	yes, barely	isolated w 64
66	29.2	Yes-M	No	Maybe	Yes big bottom whorl.	isolated from all other trees tipcurl
67	2.5	No	No	No	No discolorings on a couple.	really long leaves @ top
68	4.0	NO	NO	NO	discolorings on a couple.	tip curling
69	28.0	yes-M	Yes-1	Yes	Yes	tipcurl

FREE

irregular diameter small big small

BALSAM WOOLY ADELGID SURVEY

DATE STAND:

Tree #	dbh	Bark	Twig	Gouting	Dead Branches	other critters/comments
70	29.0	Yes-M	Yes - 1	No	Some in super shaded (Yes)	Super Robust Tip Curl completely encased
71	29.7	Yes-VVH	Yes!	No	Yes	
72	28.2	Yes-VVH	Yes on heather branches	No	Yes bottom	
73	23.0	Yes VVH	Yes	Yes	Yes.	Needles really long Not very balsamic
74	17.3	Yes VVVH	No	No	Yes	practically dead
75	21.0	Yes H	No	No	Yes	Dead
76	20.3	No	No	No	Yes	Dead. #89 adjacent
77	18.5	Yes VVVV H	No	No	Yes - bottom	Tip Curl
78	13.5	Yes L.	No	No	Yes	
79	32.6	Yes L	No	No	Yes	Getting dead Tichey
80	13.8	No	No	No	Yes	DEAD
81	19.4	Yes - H	No	No	Yes	crowding=dead side
82	39.9	Yes - M	No	No	Yes	Near Death
83	18.1	Yes- M	No	No	Yes	Lichen gets 1ST!
84	19.7	Yes - L	No	No	Yes	Just barely hg alive
85	16.7	Yes - L	No	No	Yes	
86	26.9	Yes - M barely	No	No	Yes	Near Death
87	27.0	Yes - M	No	No	Yes	half alive
88	22.8	No	No	No (WA)	Yes.	DEAD bark splitting #171
89	11.1	Yes - H	No	No.	Yes	No Tip curl Lichens but some green
90	14.2	Yes - H	No	No	Yes a few	healthier Tip Curling
91	10.4	No	No	No	Yes - but tint discolor/sun in middle.	more open/ accumulation
92	6.8	No	No	No	No	

BALSAM WOOLY ADELGID SURVEY

DATE 7/15/2009 STAND: Freeland Tract

Tree #	dbh	Bark	Twig	Gouting	Dead Branches	other critters/comments
93	13.0	Yes - L	NO	NO	yes	bottom dead pretty healthy on top
94	11.8	Yes - M	yes	NO	yes discoloration in middle	tip curling.
95	3.4	NO	NO	NO	NO	
96	2.7	NO	NO	NO	Yes	
97	23.5	Yes H	yes M	NO	yes	Tree complex alive on top broad
98	10.3	NO	NO	NO	Yes - barely	by boardwalk, just a bit of root
99	11.1	NO	NO	NO	NO	robust by boardwalk but some tip curl
100	24.9	yes	yes	YES!	NO	away from entrance one backward growing branch.