

CIPWG Invasive Plant Symposium

UCONN – Storrs

Economic Impact of Invasive Plants on CL&P Facilities

Doug Pistawka, Senior Arborist CL&P Vegetation Management

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**Connecticut
Light & Power**

A Northeast Utilities Company



CT Transmission & Distribution Stats

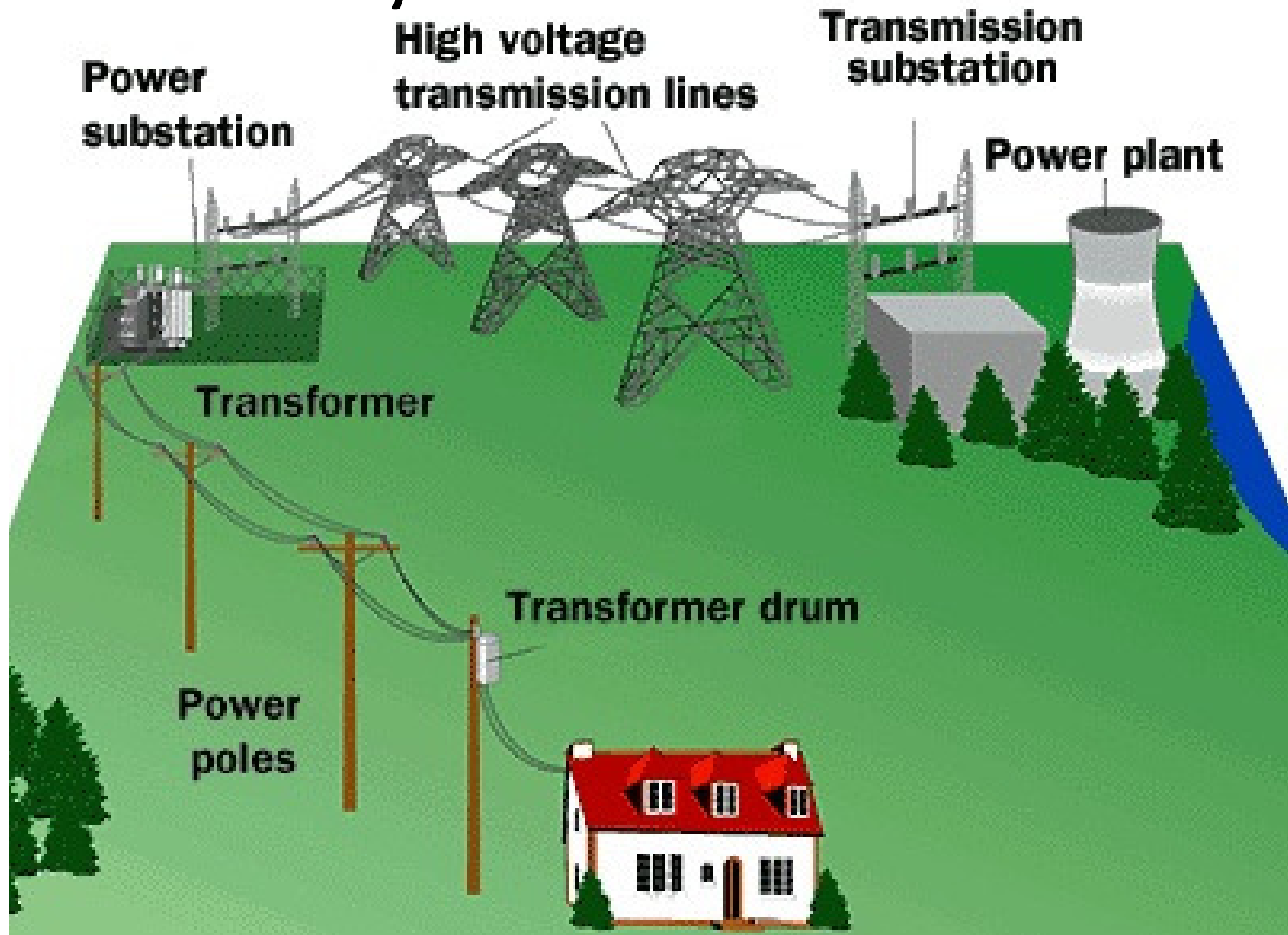
Transmission

- 1,638 miles Overhead
- 135 miles Underground
- 69 kV
- 115 kV
- 345 kV

Distribution

- 16,976 miles O/H
- 6,352 mile U/G
- 289,552 transformers
- 733,340 Poles
- 219 Substations
- 1,241,841 Meters
- 1.0, 4.8, 8.3, 11.0, 13.2, 13.8, 23, 27.6 kV

The Electrical System

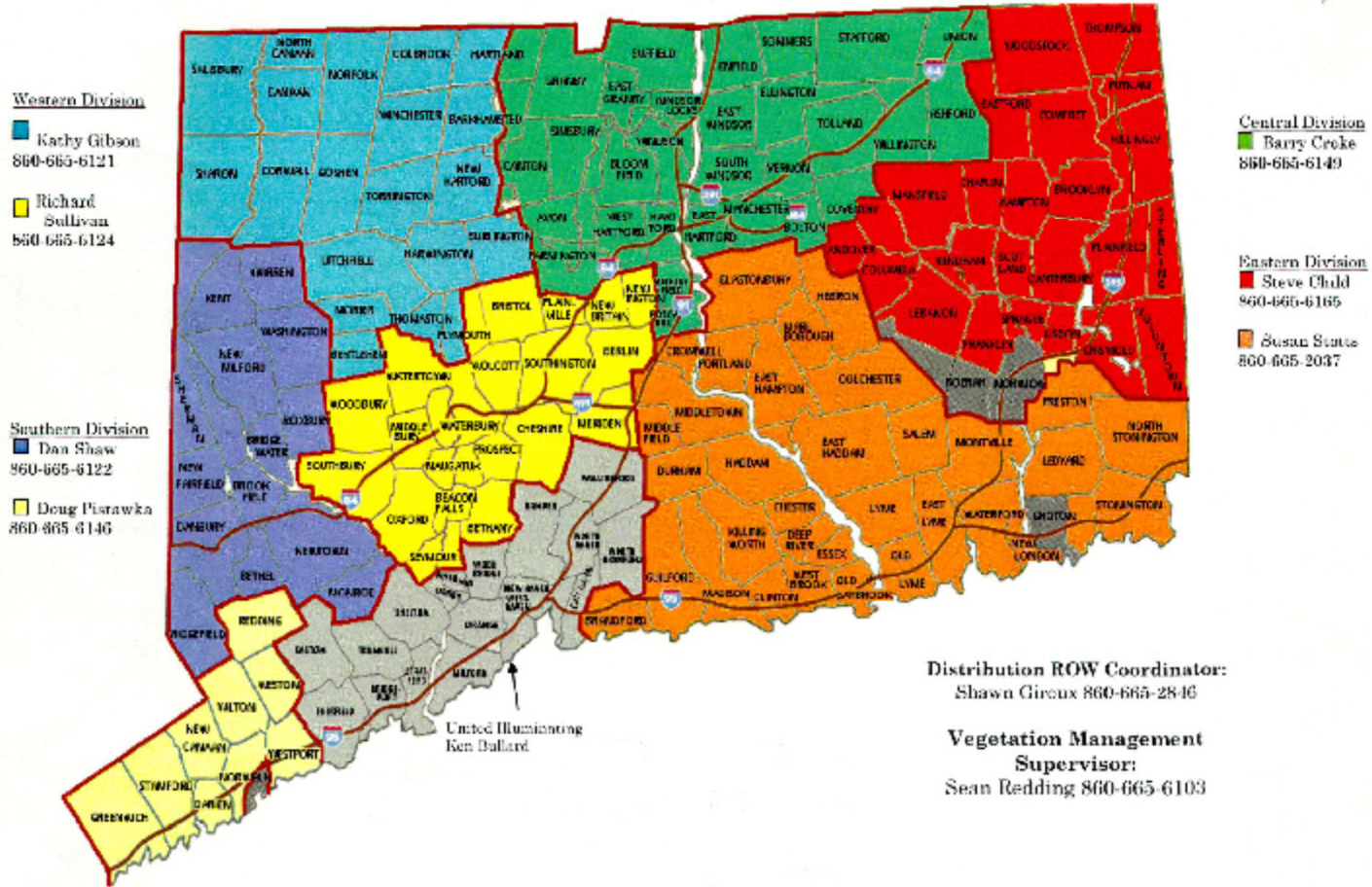


Purpose of Vegetation Management

- Safety
 - Public
 - Line worker
- Visual and Physical Access
- Prevent Equipment Damage & Oil Spills
- Reliability



**Connecticut Light & Power Vegetation Management Program Coordinator
Territory Map**



Tony Johnson Transmission Vegetation Manager

Dan Burns Transmission Arborist West

Matt Colebrook Transmission Arborist East

Purpose of ROW Integrated Vegetation Management

- Provide safe and accessible area for distribution of electricity, patrolling and maintenance
- Remove all potentially interfering tree, shrub and vine species
- Low growing shrubs, grasses, forbs, and ferns are considered desirable and are preserved and encouraged to grow



Tree Caused Outages

- Black locust tree located off right-of-way uproots causing a transmission outage to 30,000 Greenwich and Stamford customers in August, 2012
- Required 24 ton crane, 75' bucket truck and halting Metro North railway to safely remove tree and restore service



Summit Rd, Greenwich

VM Program Overview – Expanded Tree Work

- Tropical Storm Irene and Halloween Snowstorm causes two largest storms in CL&P history
- Budget increased by \$28.5 million over 2011 to \$53.5 million in 2012
- Scheduled 4900 miles of tree work incl. an additional 1,100 mi of SMT and 500 mi of ETT
- 80 tree crews added to our 110 local crews to perform this work
- Hired 6 vendor arborists to help manage the additional workload



Top 3 Invasive Trees



Norway Maple



Ailanthus



Black Locust

Assumptions:

Cost calculations assumes 10% of the trees we manage along roadsides are invasive species based on three reports:

- ECI Report, 1986 shows Norway Maple 4.9%, Ailanthus < 1% and Black Locust < 1 %
- USDAFS Northern Research Station, Research Note NRS-107, 2010. Analysis of forest inventory plots shows Norway Maple 5% in CT, MA and RI
- CT's Street Trees: A Preliminary Analysis of 12 Street Tree Inventories, Jeff Ward November 2011 shows Norway Maple 21.5%, Ailanthus 0.2% and Black Locust 0.4%
- Note: Minor Species include Amur Maple, Paulownia, Sycamore Maple and White Poplar

Emergency and Major Storm Restoration

- CL&P averages approximately 12,000 tree caused outages/year (1996 – 2010)
- **Restoration Cost (line and tree work)**
 - Major Storm: 6,000 outages x \$2,200/trouble spot x 10% Invasive = \$1,320,000
 - Non-storm: 6,000 outages x \$400/trouble spot x 10% Invasive = \$240,000
 - Total \$1.56 million



Scheduled Maintenance Program (SMT)

- 4,200 miles of distribution power lines scheduled in 2012
- Prune and remove invasive trees, brush and vines
- Includes chip disposal and traffic control costs
- **SMT Cost :**
\$23 million x 10% Invasive =
\$2.3 million



Enhanced Tree Trimming (ETT)

- 700 miles scheduled in 2012
- Segments selected from circuits with worst tree caused outage history
- Remove all branches overhanging wires and risk trees to further improve reliability
- **ETT Cost:**
\$22 million x 10% Invasive = \$2.2 million

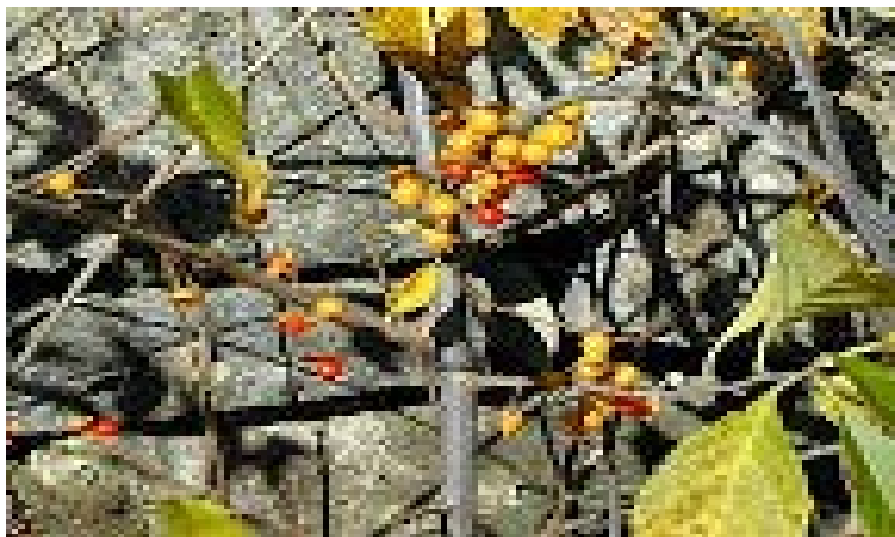
Capital/New Business

- Reliability improvement projects, load growth, pole-line extensions and upgrades
- **Capital/NB Cost:**
\$2 million x 10% Invasive = \$200,000



Vine Management Program

- Vines climb poles and guy wires causing 500 outages/year (2006-2010).
- CL&P has a proactive vine management program cutting and herbicide treating vines along 6,000 miles of power lines/year.
- **Oriental bittersweet** comprises 57% of the vines growing on CL&P facilities, grape (21%), Virginia Creeper and poison ivy (22%). Mile-a-Minute becoming a problem.
- **Vine Management Cost: \$205,000**
 - Vine Crew: $\$160k \times 57\% \text{ Invasive} = \$90k$
 - SMT Program:
 $\$23 \text{ million} \times 0.5\% \text{ Invasive} = \$115k$



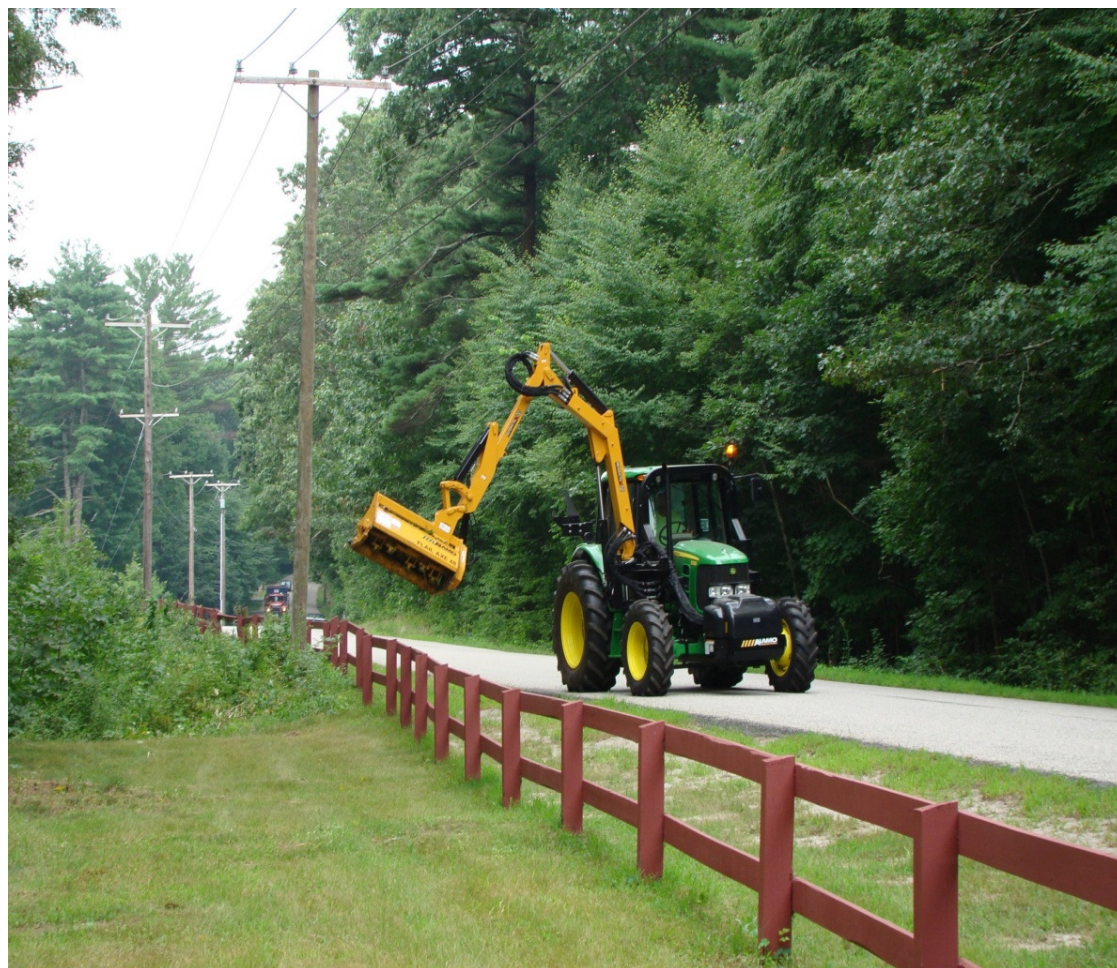
Blacksmith Hill Rd East Hampton

Mower Alliance Contracts

- Municipalities and CL&P share in roadside brush maintenance
- Win-Win for Towns and CL&P
- CL&P pays for mower lease while Towns pay for labor and equipment upkeep
- Mower has flail mower deck and 17' long boom to extend it's reach off road
- Both benefit from safer roadsides, better line of sight, reduced brush maintenance costs and improved electric reliability
- Two pilot contracts:
 - Vernon/Somers/Coventry
 - Woodstock/Union/
Eastford/Ashford

Mower Cost:

\$50k x 20% Invasive = \$10k



Top 5 Invasive Shrubs



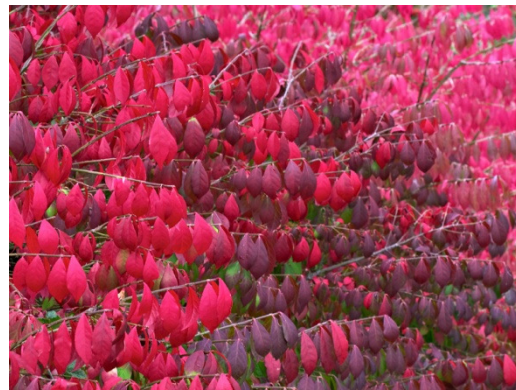
Autumn and Russian Olive



Honeysuckle



Multiflora Rose



Winged Euonymus



Barberry

Assumptions:

- Invasive trees and shrubs account for on average 20% to 30% of the target species on ROW's
- Minor Species: Buckthorn, Privet, False Indigo, Rugosa Rose and Wineberry

ROW Integrated Vegetation Management

- Invasive shrubs like Autumn olive, honeysuckle and multiflora rose were widely planted for erosion control, habitat improvement and landscaping.
- They were once considered desirable on ROW's and in time, spread into dense thickets impeding foot and vehicular access needed for patrols, line work, vegetation management and outage restoration.



CT-08 Coventry/Columbia T ROW

- Autumn olive spreads into dense monocultures along ROW's in some areas comprising over 80% of the plant community
- Olive brush is so dense in areas you have to crawl through tunnels to access line



- Autumn olive can top out into power lines and provide a trellis for climbing vines creating a potential for outages.
- Two 27.6 kV circuits overbuilt on 13.8kV circuit on 35' poles



ROW 185 Colchester

Invasive shrubs block roads impeding access and grow into electrical equipment.



ROW Integrated Vegetation Management

- Herbicide Treatment and Manual Cutting
Distribution: $125 \text{ mi D ROW/year} \times \$4,000/\text{mi} \times 30\% \text{ Invasive} = \$150,000$
Transmission: $\$1,000,000 \times 20\% \text{ Invasive} = \$200,000$
- Distribution Mowing: $120 \text{ acres/year} \times \$390/\text{acre} \times 30\% \text{ Invasive} = \$14,000$
- Distribution Side Trimming: $\$600,000/\text{year} \times 6\% = \$36,000$
- Total ROW Cost = $\$400,000$





MAM (*Persicaria perfoliata*) confirmed at East Rocks S/S, Norwalk

- Since 2009, CL&P has partnered with UConn and CAES to monitor and manage the outbreak
- Distribution ROW feeding 5,700 Norwalk and Westport customers
- Mile-a-Minute growing along ROW, inside substation and on poles and landscaping

Mile-a-Minute Identification

- Triangular leaves
- Small curved barbs along stems
- Saucer-shaped ocrea at nodes encircle the stem
- Fruits ripen from green to metallic blue

Since then, MAM found at other ROW locations:

- Shared T&D ROW Kent Rd, Wilton
- Westover Rd, Stamford
- Cos Cob ROW, Greenwich



Kent Rd, Wilton

CL&P Cooperator in Biological Control Program

- 1,000 weevils (*Rhinoncomimus latipes*) introduced at East Rocks S/S June 2011 to reduce the impact of the MAM
- Within 3 months, weevils found 1.2 mi away at 2nd MAM infestation at Kent Rd, Wilton
- 1,000 weevils introduced at Kent Rd ROW June 2012 to supplement the population
- Weevil introductions began in CT in 2009
- CAES and UConn released 24,500 weevils in 11 CT towns at 24 locations thus far





Media Frenzy

06/15/2011

Weevil Monitoring Study

- Weevils quickly became established and multiplied
- Weevil adults feed heavily on leaves and larvae feed in shoots
- Both sites showing some growth suppression, stunted growth and stacking of nodes
- Some reintroduction of other exotic and native species (garlic mustard and deer tongue)
- Biological Control Cost: \$0



East Rocks Rd, Norwalk

CL&P Invasive Plant Management Cost

Program	Expenditure \$
Emergency and Major Storm Restoration	1,560,000
Scheduled Maintenance Trimming	2,200,000
Enhanced Tree Trimming	2,300,000
Capital/New Business	200,000
Vine Management Program	205,000
Mower Alliance Contract	10,000
ROW Integrated Vegetation Management	400,000
Mile-a-Minute Management	0
Total	\$6,875,000

Anything we can do to reduce the cost of managing invasive plants benefits CL&P and it's customers !

Future Needs:

- Encourage Compatible Tree Planting - Replace invasive trees with appropriate species
- Consistent Herbicide Appl – Better control invasive plants along roadsides and ROW's
- Two Storm Panel & VM Task Force recommend additional funding for tree work to better manage CT's roadside forest (for CL&P, Towns and DOT)
- More biological control as appropriate

