



Department of
Environmental
Conservation

A resurgence of red pine scale in New York

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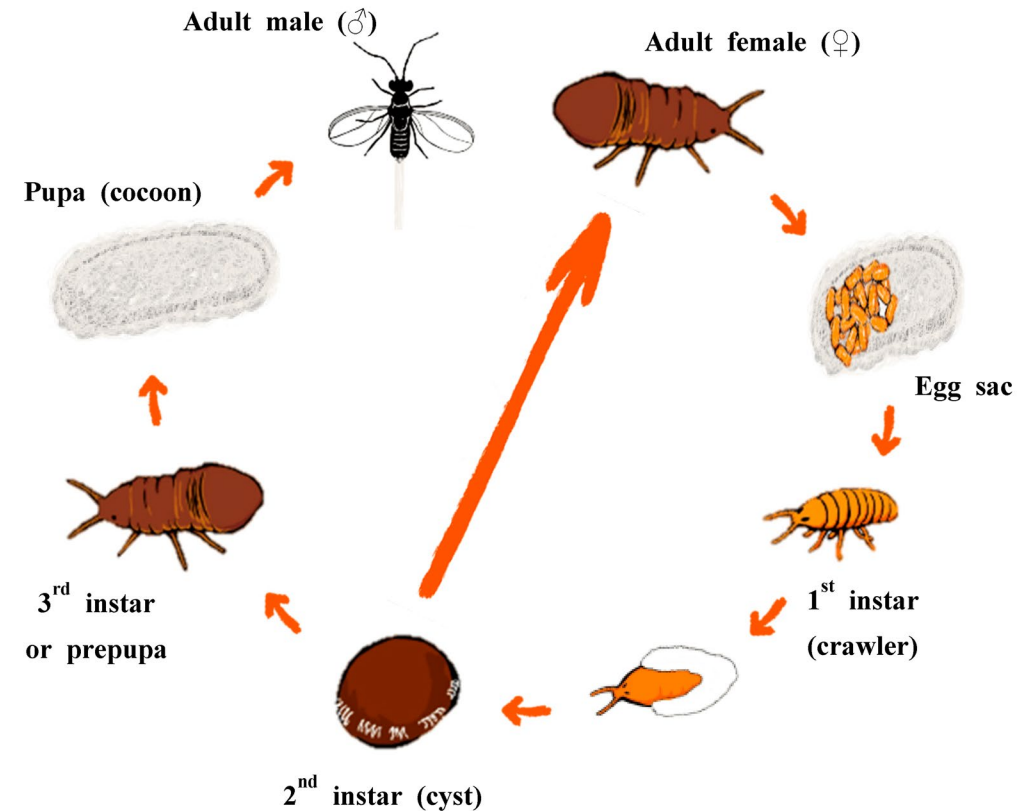
FEMC Conference November 20, 2025

Life Cycle



Two generations a year

- 1st Generation
 - Eggs laid in May
 - 1st instar in June
 - Cyst stage (2nd instar) mid-July
 - Pre-adult males spin cocoons in August and turn into winged adults
 - Pre-adult females emerge from cyst stage, mate, and lay eggs inside ovisacs August – September
- 2nd Generation
 - Crawlers hatch in late Fall, become dormant, and overwinter in ovisacs
 - Turn into cyst stage in April and rapidly develop into adults



Red Pine Scale

- *Matsucoccus matsumurae*
- Native to Japan
- First NA detection in 1946 in Easton, Connecticut

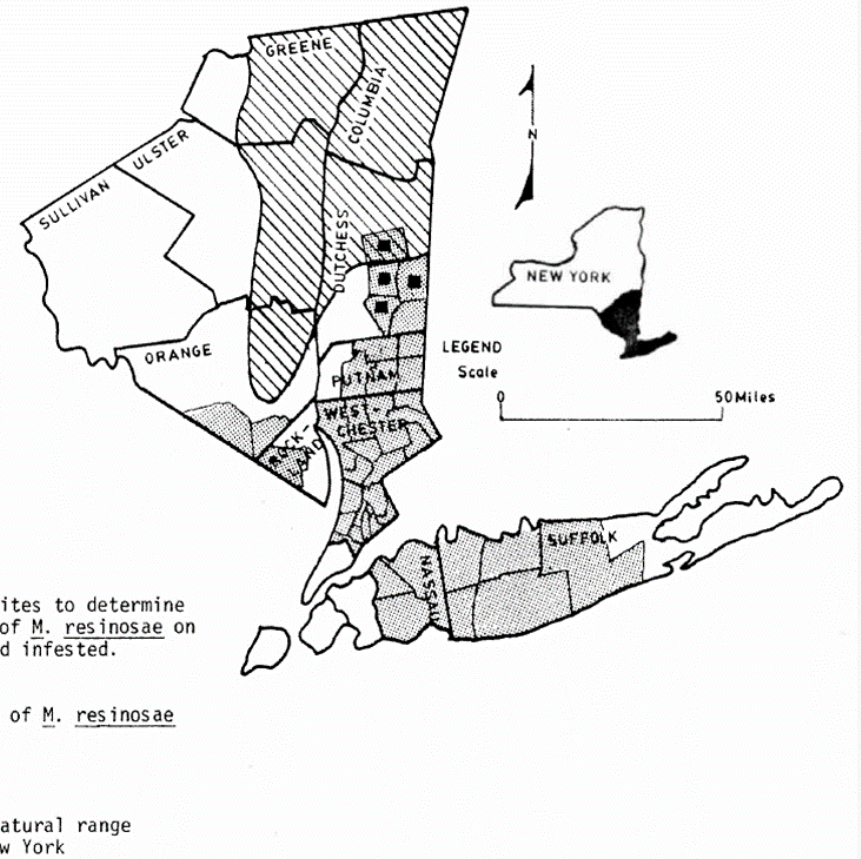


Figure 5.--1985 Distribution of *M. resinosae* in New York

“We have no way of controlling it,” Fred L. Gerty Jr., a New York State forester, said during an inspection tour the other day. “The real problem with this insect is that if it continues to spread, it will one day kill every red pine tree on the North American continent.” 1977, New York Times

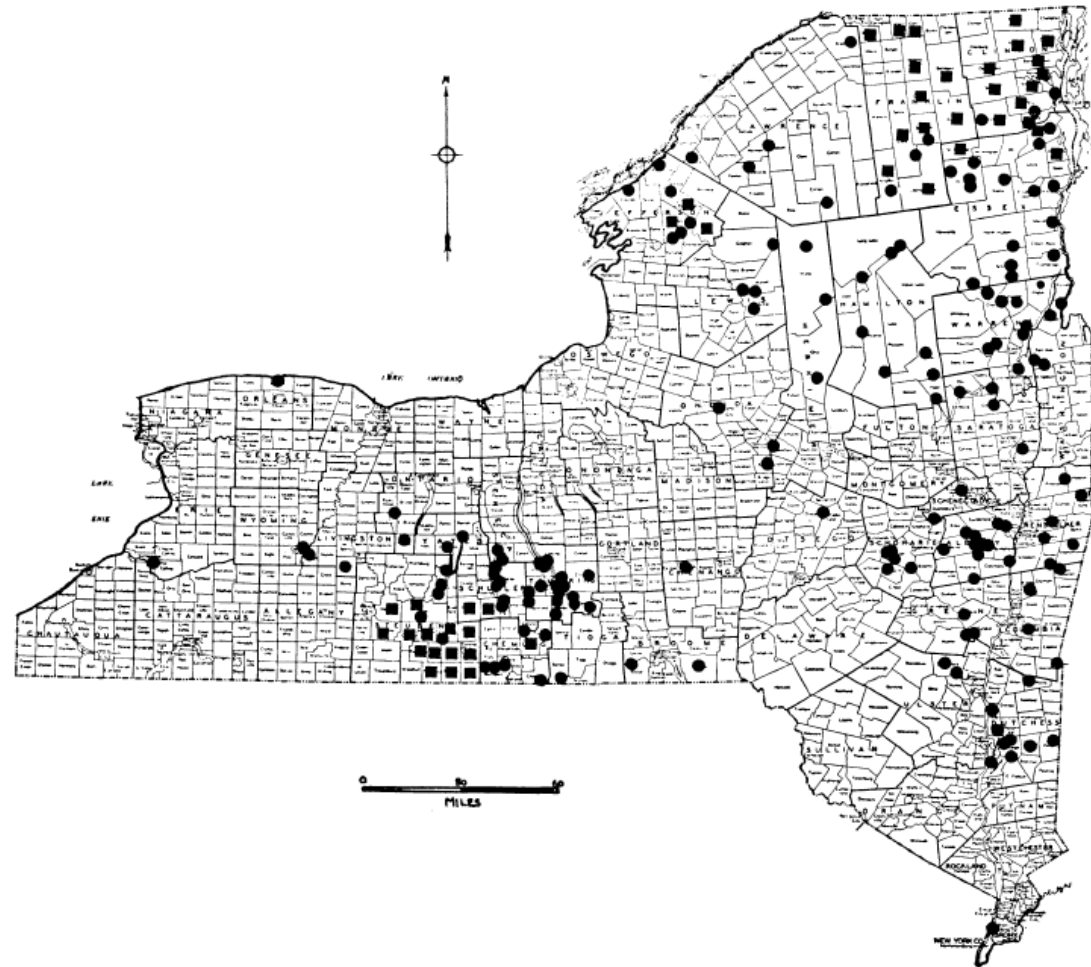


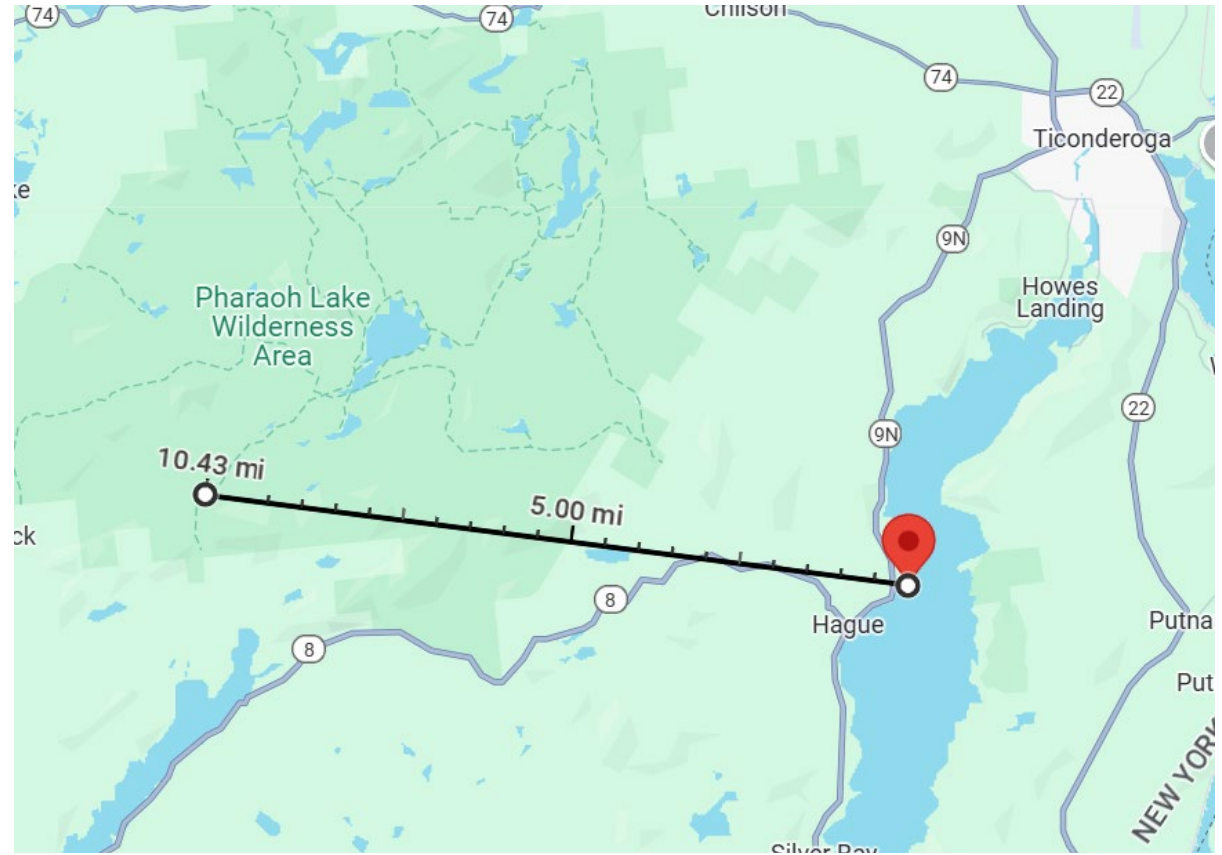
FIG. 2. The natural distribution of red pine in New York. See text for explanation.

Cook, David B., et al. “The Natural Distribution of Red Pine in New York.” *Ecology*, vol. 33, no. 4, 1952, pp. 500–12. JSTOR, <https://doi.org/10.2307/1931524>. Accessed 5 Dec. 2024.

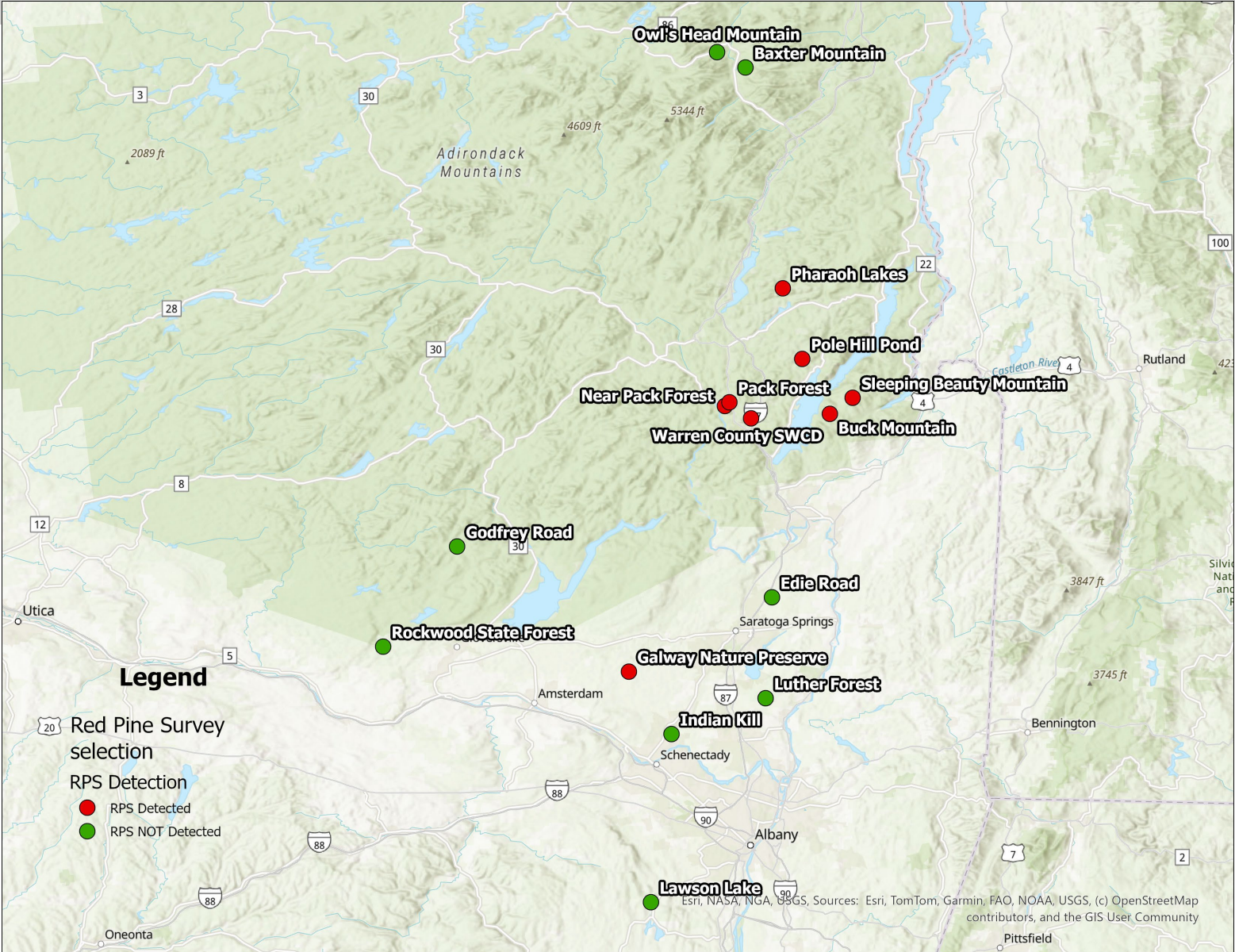
Hague, NY 2024



Pharaoh Lake Wilderness Area



Red pine Survey



Red pine plots

Red Pine Scale Survey Plots

Site: Buck Mtn. Plot #: 1 Waypoint (GPS): _____

Surveyor Initials: _____ Date: _____

8m Plots RPA

Spp.	DBH	Alive / Dead	LCR %	CT %	Canopy Class	Snag Class	RPS Class	Regen. RPS MTLU	Comments
PINRES	8.3	A	70	75	U OT I CD D	1	1	Y	
PINRES	4.7	A	10	85	U OT I CD D	2	0	U	
PICRUB	2.2	A			U OT I CD D				
PICRUB	2.4	A			U OT I CD D				
PICRUB	3.0	A			U OT I CD D				
PICRUB	1.7	A			U OT I CD D				
PINRES	9.4	A	50	45	U OT I CD D	2	1	U	
PINRES	10.5	A	60	55	U OT I CD D	2	1	U	Possible RPA
PINSTR	10.5	A			U OT I CD D	2	1	U	
PINRES	0.5	A	100		U OT I CD D	1	1	Y	Notes following from 2 ps possible RPA
PINSTR	0.4	A			U OT I CD D				
PINSTR	3.2	A			U OT I CD D				
PINSTR	2.1	A			U OT I CD D				
PINSTR	2.3	A			U OT I CD D				
PINRES	7.6	A	50	65	U OT I CD D	2	1	Y	
PINRES	8.5	A	100	65	U OT I CD D	1	2	Y	
BETPAP	1.7	A			U OT I CD D				
PINRES	9.1	A	100	65	U OT I CD D	1	2	Y	
PINRES	11.1	A	50	65	U OT I CD D	2	1	U	
PINRES	4.6	A	90	75	U OT I CD D	1	2	Y	
PINSTR	3.8	A			U OT I CD D				
PINSTR	8.9	A			U OT I CD D				
PINSTR	1.0	A			U OT I CD D				
					U OT I CD D				

Plot 1 Notes - 2 PINRES just outside 8m highly impacted by likely RPS - (sample collected)
 DBH < 1 m ~ 1 height 4' and 6' respectively - flagging scores 3 and 4 respectively
 Regen: No PINRES but lots of PINSTR



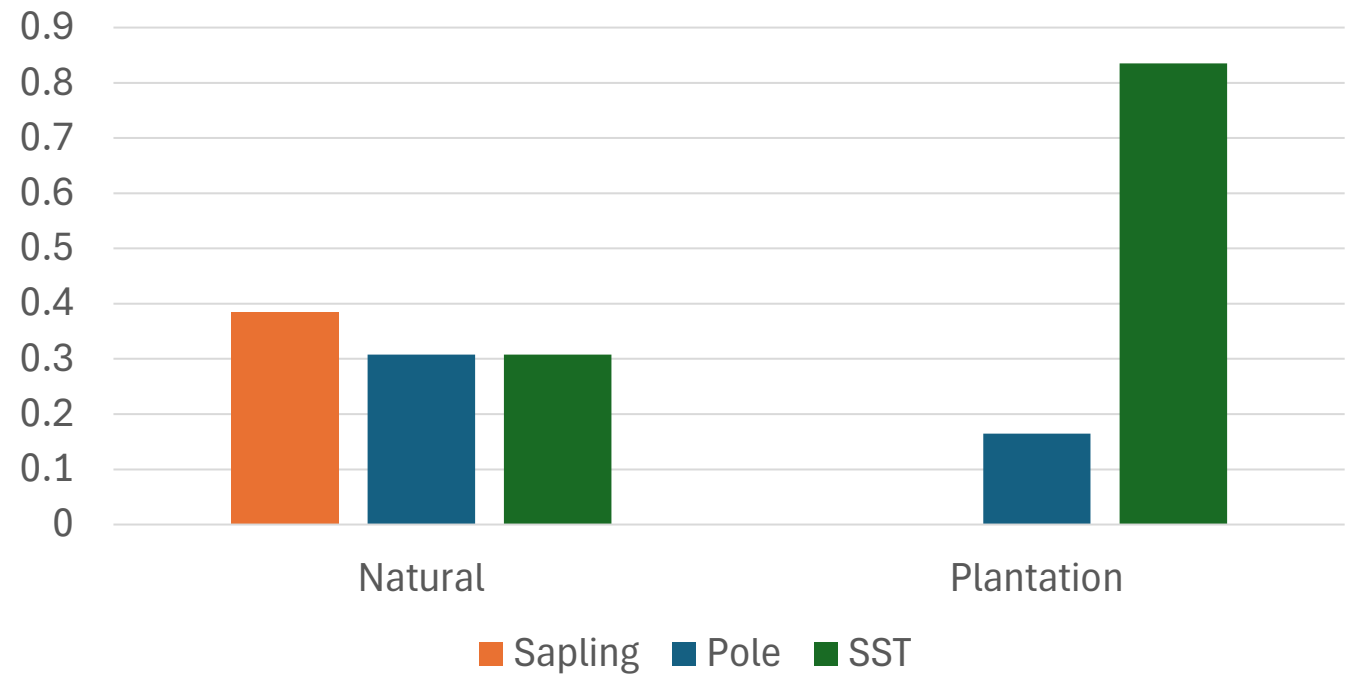
Site	Origin	RPS	Plot Quantity
Baxter Mtn	Natural	No	1
Buck Mtn	Natural	Yes	8
Edie Road	Plantation	No	6
Galway NP	Plantation	Yes	1
Indian Kill	Plantation	No	1
Lawson Lake	Natural	No	2
Luther Forest	Plantation	No	1
Owl's Head	Natural	No	1
Pack Forest	Plantation	Yes	6
Pharoah Lakes	Plantation	Yes	6
Rockwood SF	Plantation	Yes	1
Sleeping Beauty	Natural	Yes	5
Total			39

Results



Red Pine	RP Prop	RP BA Prop	RP Dead
Natural	25%	46%	25
Plantation	16%	65%	60

Red pine size class distribution



Crown transparency

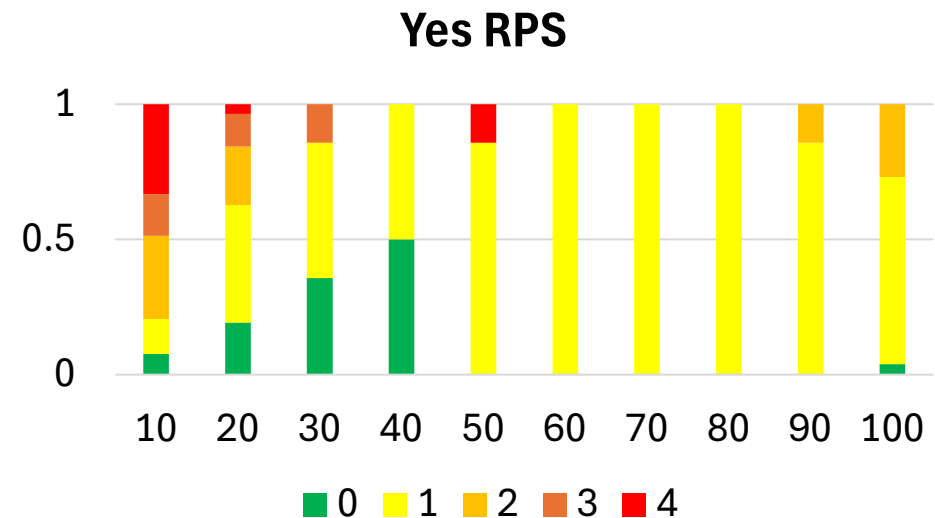
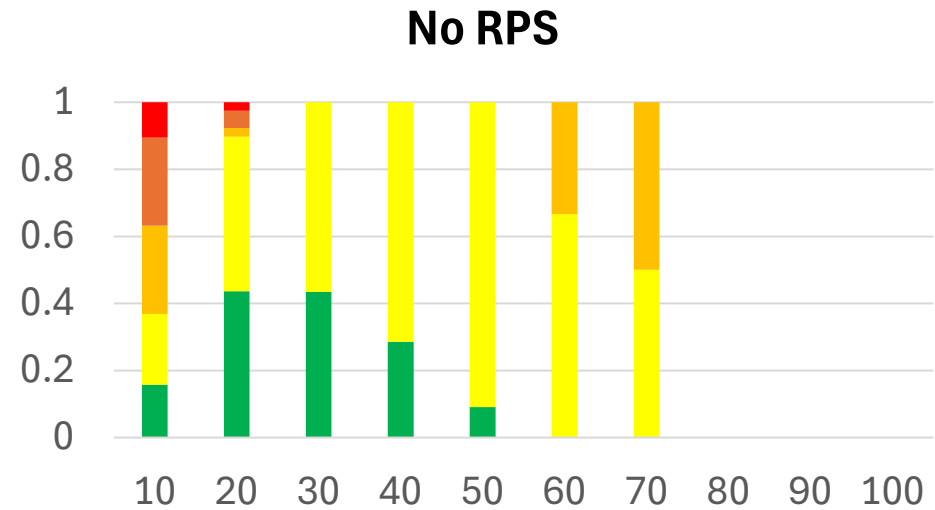
AVG CT	Natural	Plantation	Grand Total
N	58.14815	61.84210526	60.04504505
Y	50.39474	56.68141593	54.15343915
Grand Total	53.61538	58.41176471	



Flagging and Live Crown Ratio

AVG LCR	Natural	Plantation
Grand Total	51.36	18.24

Wilcoxon Ranked Sum Test				
Average Flagging	Natural	Plantation	Grand Total	WRST p-value
N	0.85	1.07	0.96	
Y	0.99	1.88	1.52	
Grand Total	0.93	1.61	1.31	0.0000091
WRST p-value			0.00000434	



Buck Mountain

- Surveyed in 2020
- No RPS in 2020
- RPS found in 2025

	2020	2025
Average Crown Transparency	36.88	46.69



Consensus ML phylogenetic tree

DNA from the Lakes George/Pharaoh is 99.91% similar to *M. matsumurae*.

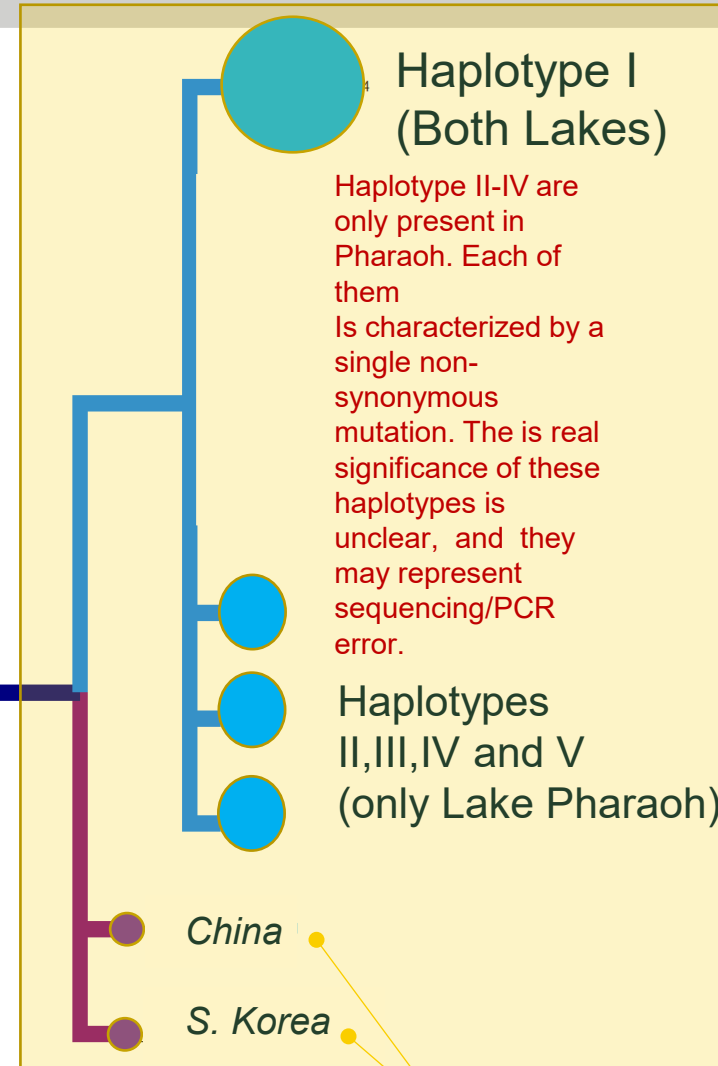
A single non-synonymous SNP (A215T) and 3 synonymous (C291T, T375C AND C290T) mutations are shared by all lakes samples, making them a distinctive clade.

The C291T mutation is also present in the reference sequence from China.

These observations are consistent with the lake samples being part of a *M. matsumurae* complex (which likely includes undescribed species).

DNA from the Lakes George/Pharaoh is ~ 7% divergent from to *M. alabamae* which is the closest species with a COI reference sequence. There is no reference sequence for *M. gallicollis*

Haplotype abundance (# reads/Lake)		
	L. George	L. Pharaoh
Haplotype I	1,967	2,405
Haplotype II		356
Haplotype III		337
Haplotype IV		315
Haplotype V		312



M. Alabamae These are only available reference sequences



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