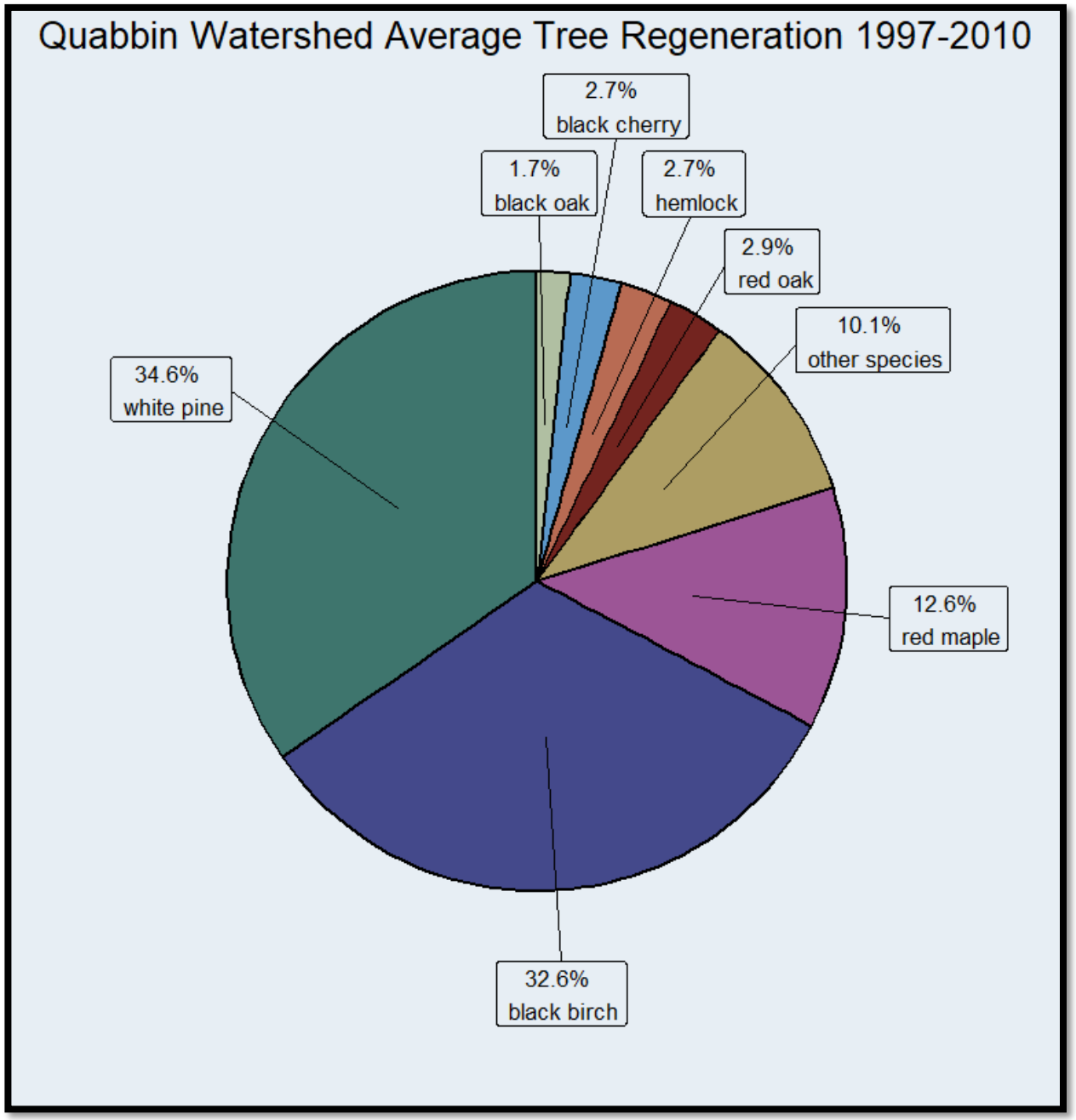
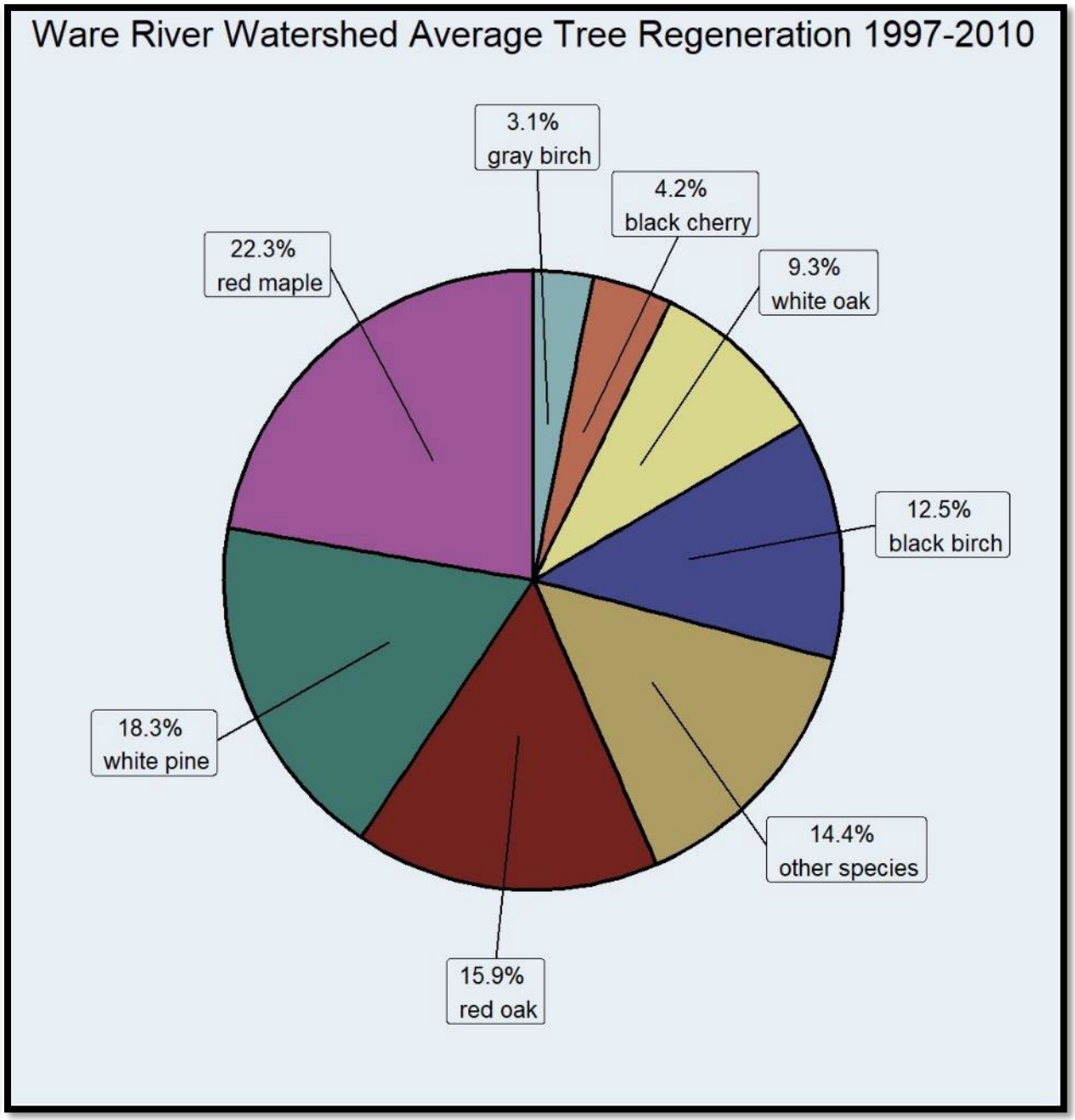
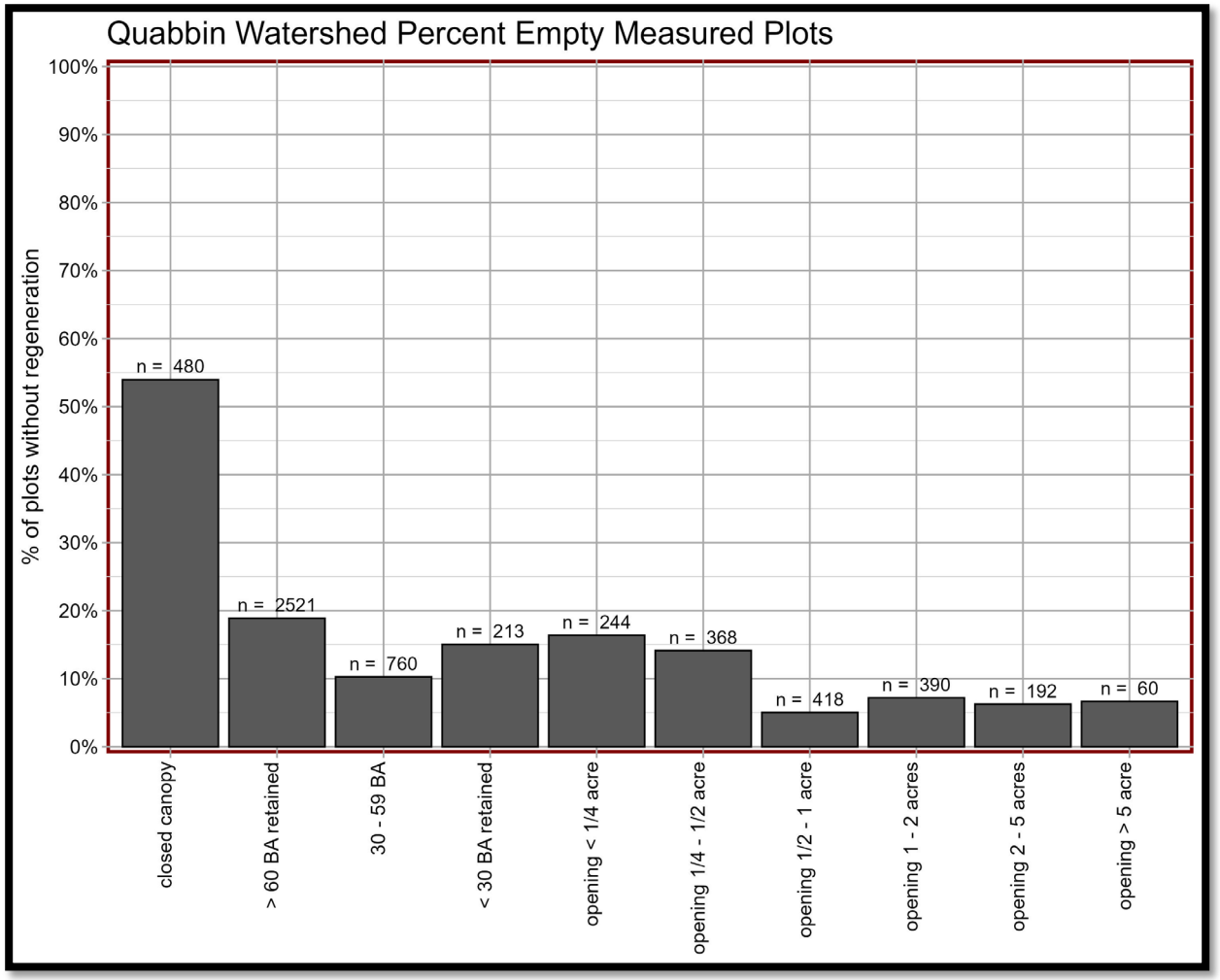
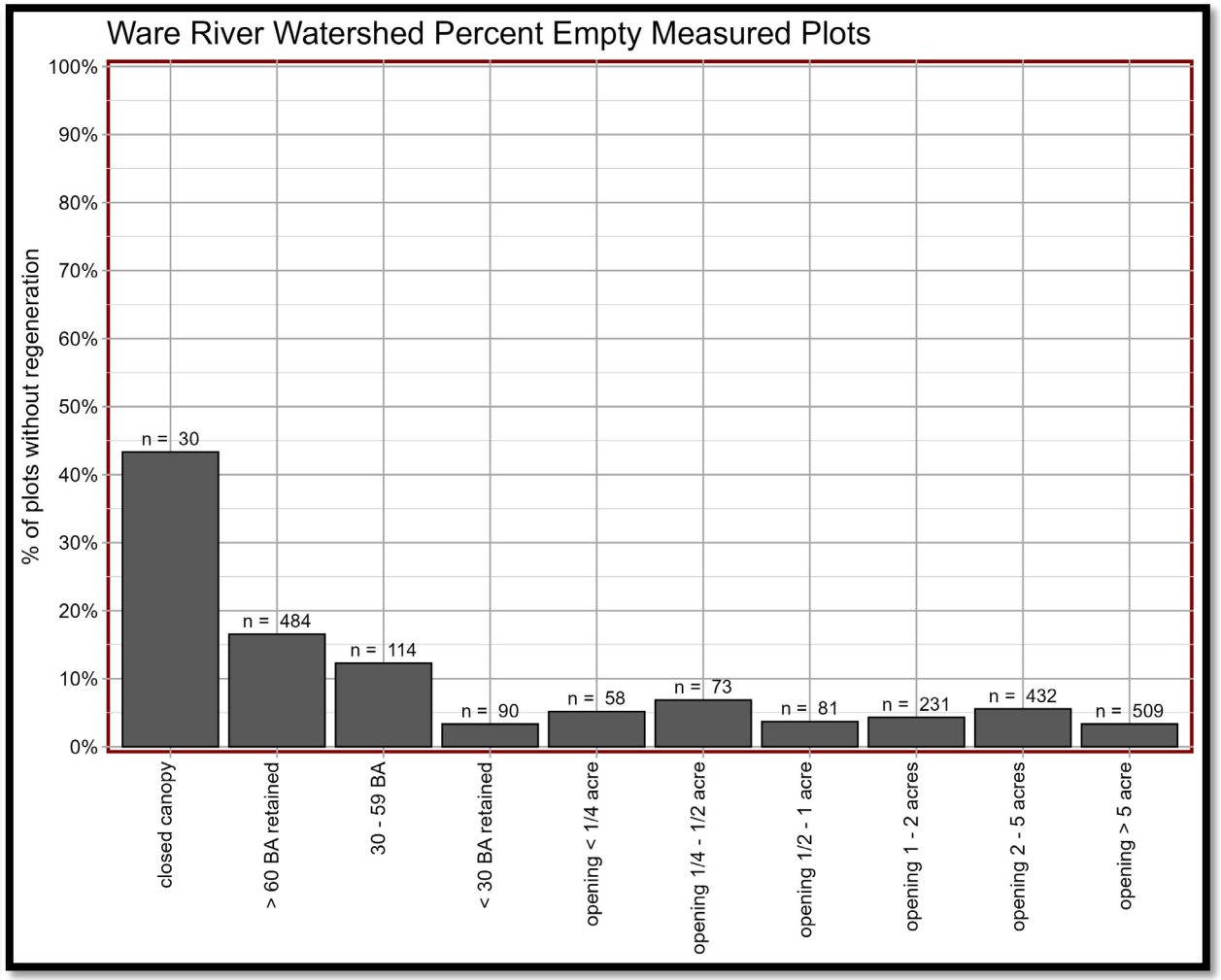
15 Years Post Harvest – 2 Tallest Stems



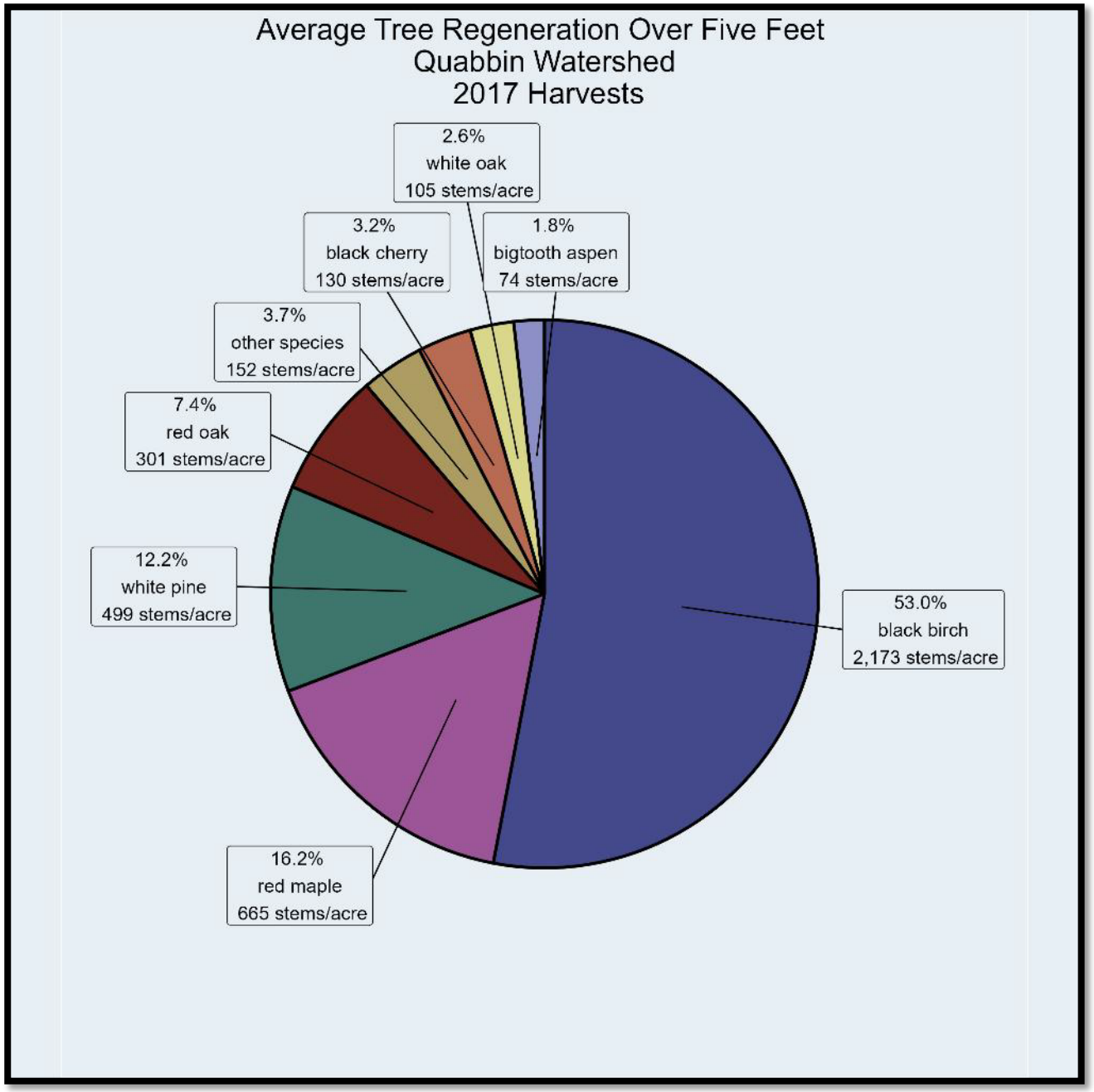


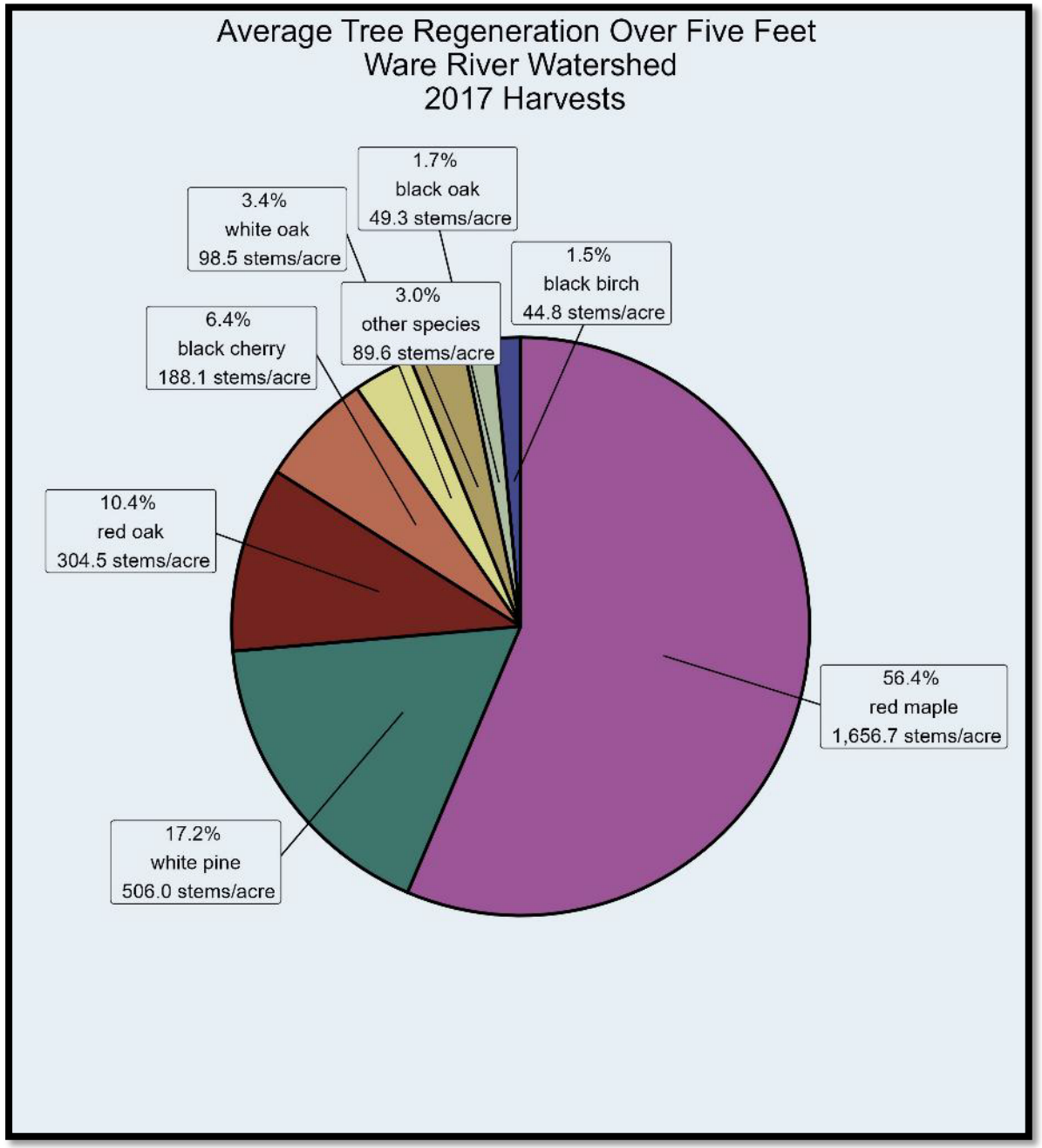
15 Years Post Harvest – 2 Tallest % Empty Plots





8 Years Post Harvest – Full Stem Count By Species and Height Class





8 & 15 Years Post Harvest – Full Stem Count By Species and Height Class

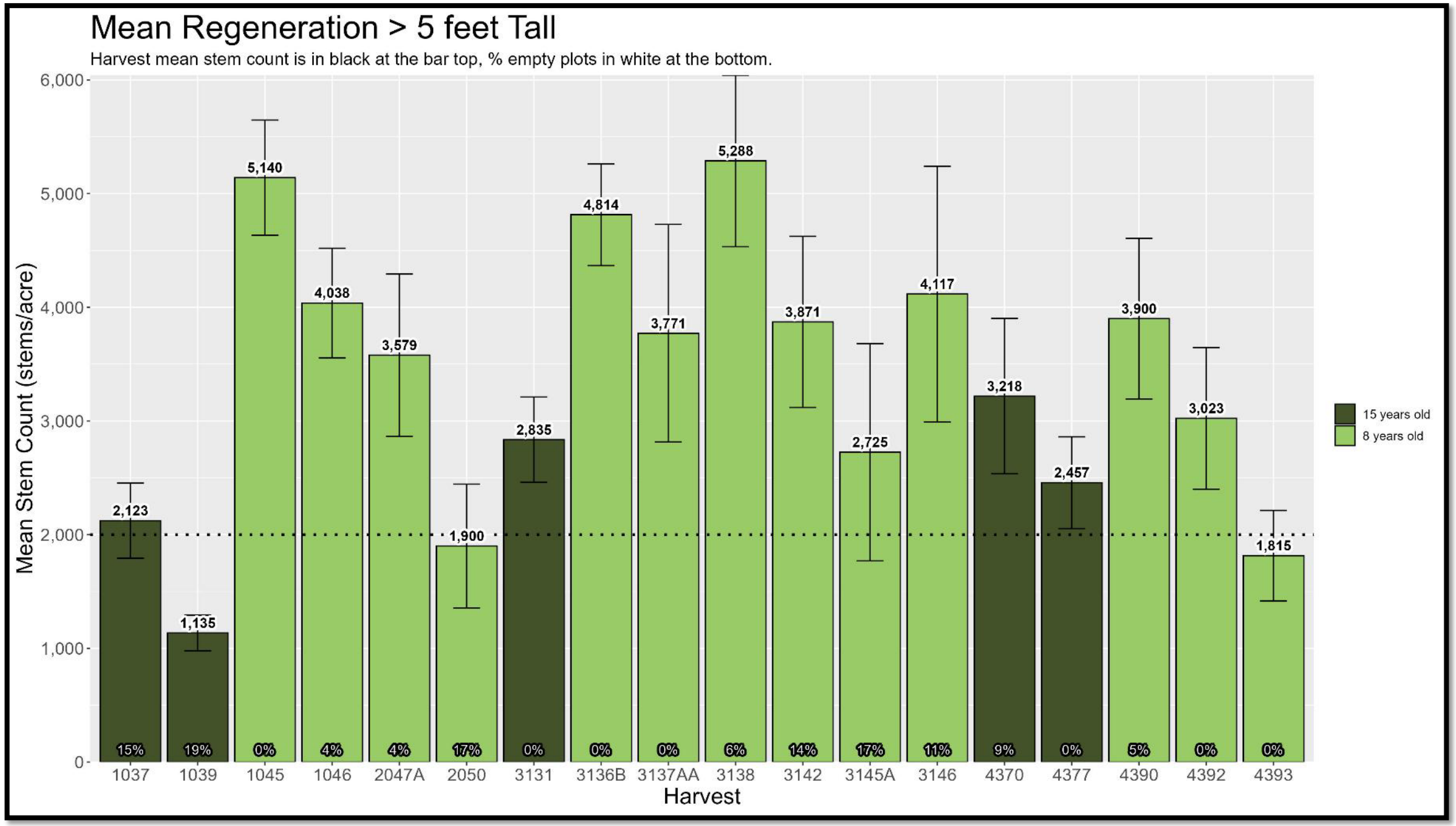
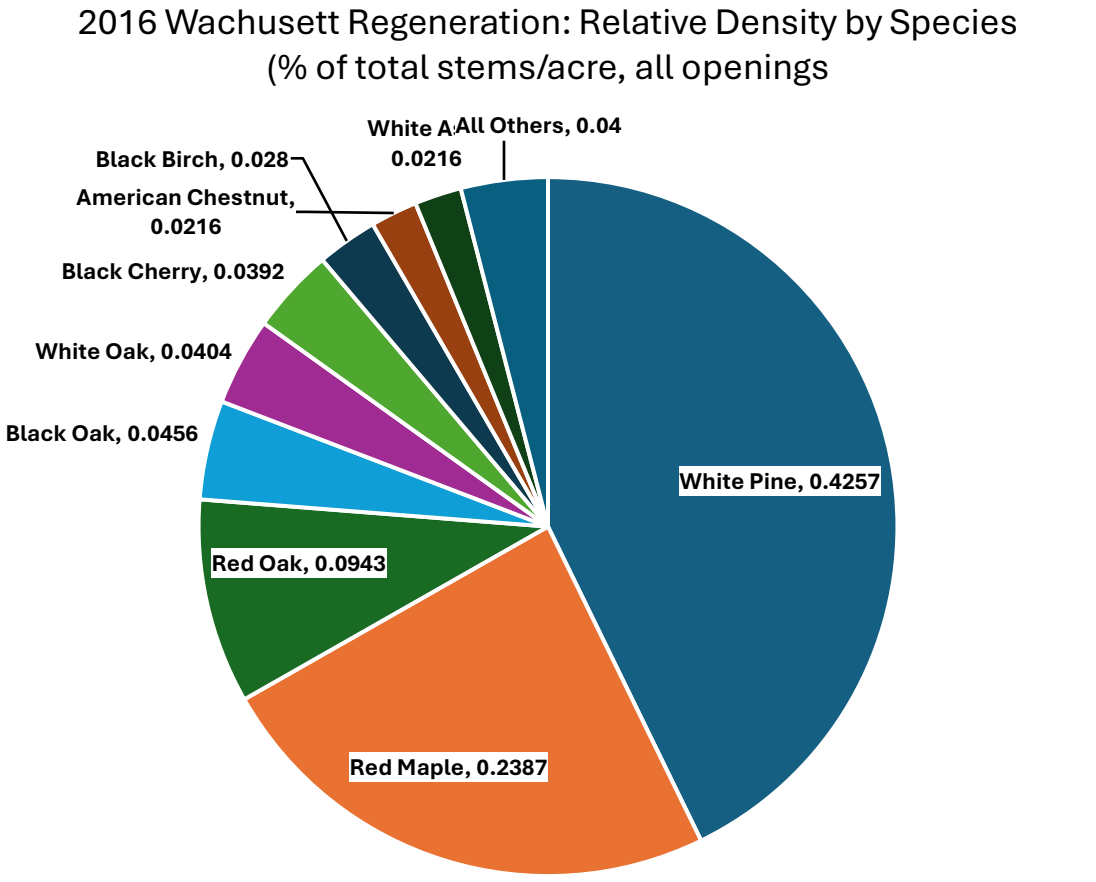


Table 2. Wachusett Reservoir 2016 tree regeneration sampling results (mean and standard error by height class) by opening age and size classes.*

		Size Class (acres)				
		1 (<0.5 ac)	2 (0.5-1 ac)	3 (1-1.5 ac)	4 (1.5-2 ac)	AGE CLASS TOTALS
Age Class (years)	1 (0-2 yrs)	Sm. **3,694** *(1,421)* Tall **1,094** *(345)* All **5,059** *(1,623)*	Sm. **3,568** *(1,394)* Tall **1,860** *(683)* All **5,428** *(1,806)*	Sm. **2,582** *(1,283)* Tall **1,733** *(448)* All **4,315** *(907)*	Sm. **2,038** *(495)* Tall **758** *(236)* All **2,796** *(340)*	Sm. **4,028** *(775)* Tall **1,811** *(392)* All **5,839** *(971)*
	2 (3-5 yrs)	Sm. **4,148** *(1,198)* Tall **2,971** *(484)* All **7,119** *(1,345)*	Sm. **2,405** *(605)* Tall **3,644** *(1,243)* All **6,049** *(1,210)*	Sm. **4,200** *(730)* Tall **376** *(362)* All **4,576** *(1,075)*	Sm. **6,042** *(1,863)* Tall **4,397** *(631)* All **10,439** *(1,535)*	Sm. **4,620** *(1,392)* Tall **3,121** *(993)* All **7,741** *(2,163)*
	3 (6-9 yrs)	Sm. **11,112** *(6,246)* Tall **9,342** *(4,066)* All **20,454** *(9,860)*	Sm. **4,772** *(1,179)* Tall **6,006** *(1,449)* All **10,779** *(2,462)*	Sm. **4,108** *(765)* Tall **4,987** *(1,484)* All **9,096** *(2,177)*	Sm. **4,113** *(1,291)* Tall **5,408** *(1,664)* All **9,521** *(2,563)*	Sm. **4,837** *(748)* Tall **5,806** *(946)* All **10,643** *(1,564)*
Size Class Totals(%)		Sm. **17,328** *(6,119)* Tall **11,703** *(4,375)* All **29,032** *(10,004)*	Sm. **6,319** *(1,240)* Tall **7,354** *(1,568)* All **13,674** *(2,603)*	Sm. **5,150** *(728)* Tall **4,766** *(1,435)* All **9,916** *(1,997)*	Sm. **5,423** *(1,154)* Tall **5,568** *(1,453)* All **10,991** *(2,253)*	**Overall Totals** Sm. **6,745** *(832)* Tall **6,606** *(1,002)* All **13,351** *(1,684)*

* Explanation of cell contents:

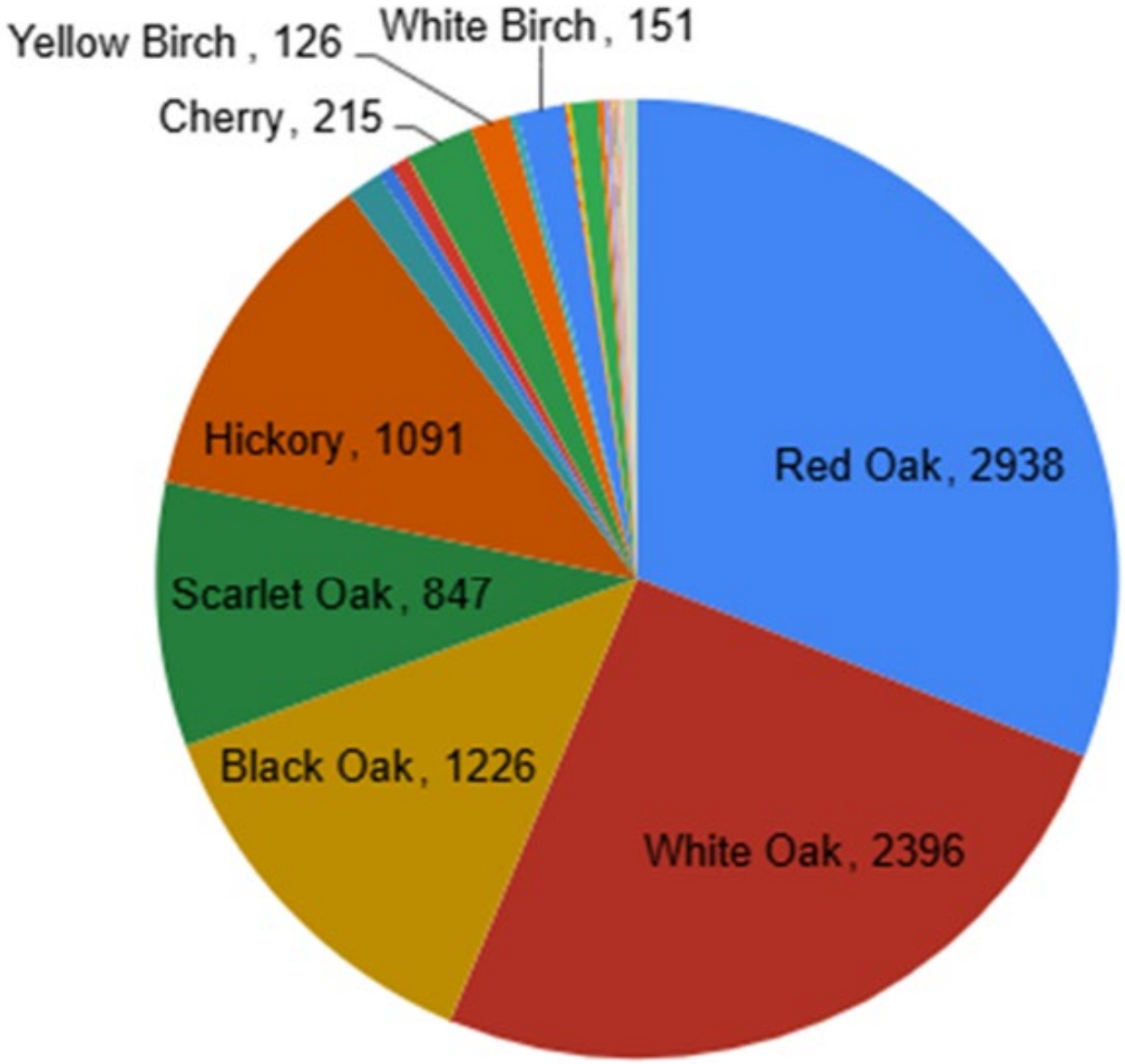
Sm. = stems >1' tall up to 4.5' tall
Tall = stems >4.5' tall up to 5.5 inches dbh
All = all regen stems
X *(Y)* **X** = mean stems per acre; *Y* = standard error of the mean


2016 Wachusett Regeneration: Relative Density by Species
(% of total stems/acre, all openings
White A
0.0216
All Others, 0.04
Black Birch, 0.028
American Chestnut,
0.0216
Black Cherry, 0.0392
White Oak, 0.0404
Black Oak, 0.0456
White Pine, 0.4257
Red Oak, 0.0943
Red Maple, 0.2387

FSI

White pine saplings felled to release oak saplings at Quabbin Reservoir.

FSI Program Since December 2023



- 9,517 stems released
- 33 different species
- 264.9 acres of openings
- 35.9 stems per acre

DCR DWSP Forest Reserves

Ken MacKenzie
DCR Division of Water Supply Protection
Director of Natural Resources

FOREST RESERVE'S ROLE

What a Forest Reserve is meant to protect

Forest reserves are formally designated landscapes where natural processes drive long-term forest structure, composition, function, and dynamics.

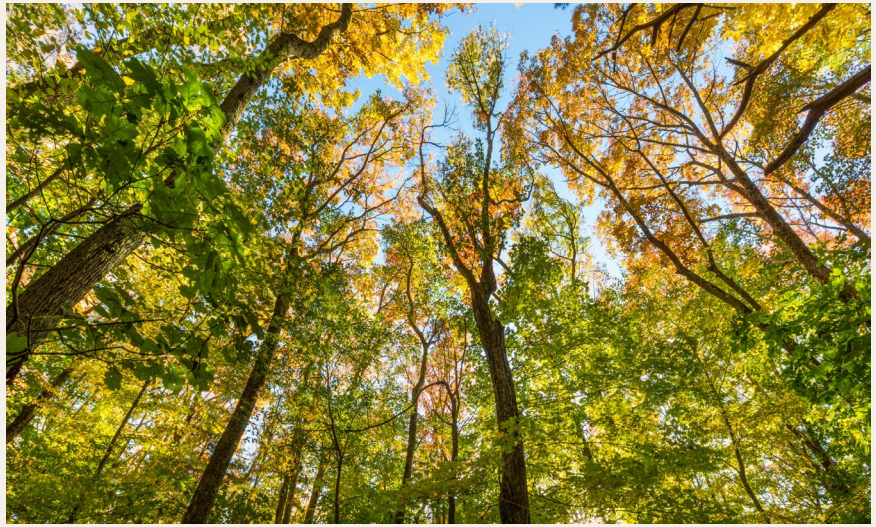
CORE BENEFITS

Allow older forests to mature and develop over time.

Protect biodiversity, habitat, water resources, and ecological integrity.

Contribute to carbon storage and sequestration by keeping forests as forests.

Support low-impact recreation and serve as reference sites for research.



Reserves complement active stewardship elsewhere on the landscape; they do not replace agency missions for water supply, wildlife habitat, forestry, public access, or public safety.

The criteria create a consistent screen

1

Representativeness

Diverse forest types, elevations, soils, landforms, structures, and ecological services.

2

Landscape context

Connection to larger protected and resilient landscapes, with low-conflict public access.

3

Ecological condition

High forest integrity, unique natural features, climate resilience, and manageable risks.

The criteria are designed to be repeatable across DCR State Parks, DCR Water Supply Protection, and MassWildlife lands while still allowing mission-specific objectives.

RESERVE IDENTIFICATION WORKFLOW

GIS identifies candidates; Field review confirms them

1 GIS screen

Map candidate areas using reserve criteria, ownership, protected-land context, resilience, ecological features, and known constraints.

2 Agency review

Check mission compatibility, operational needs, public access, water supply, wildlife values, and stewardship responsibilities.

3 Field verification

Visit priority sites to confirm conditions, boundaries, infrastructure, ecological value, and practical designation issues.

Field-based insight ensures decisions are accurate, practical, and ecologically sound.

Confirms that mapped assumptions match on-the-ground conditions.

Identifies public safety, access, boundary, cultural resource, and infrastructure needs.

Distinguishes passive reserve management from necessary stewardship and protection activities.

Reserve siting favors connected, resilient landscapes

Coordination across agencies looks beyond individual parcels to the larger protected-land network.

Prioritizes proximity to other protected lands regardless of designation.

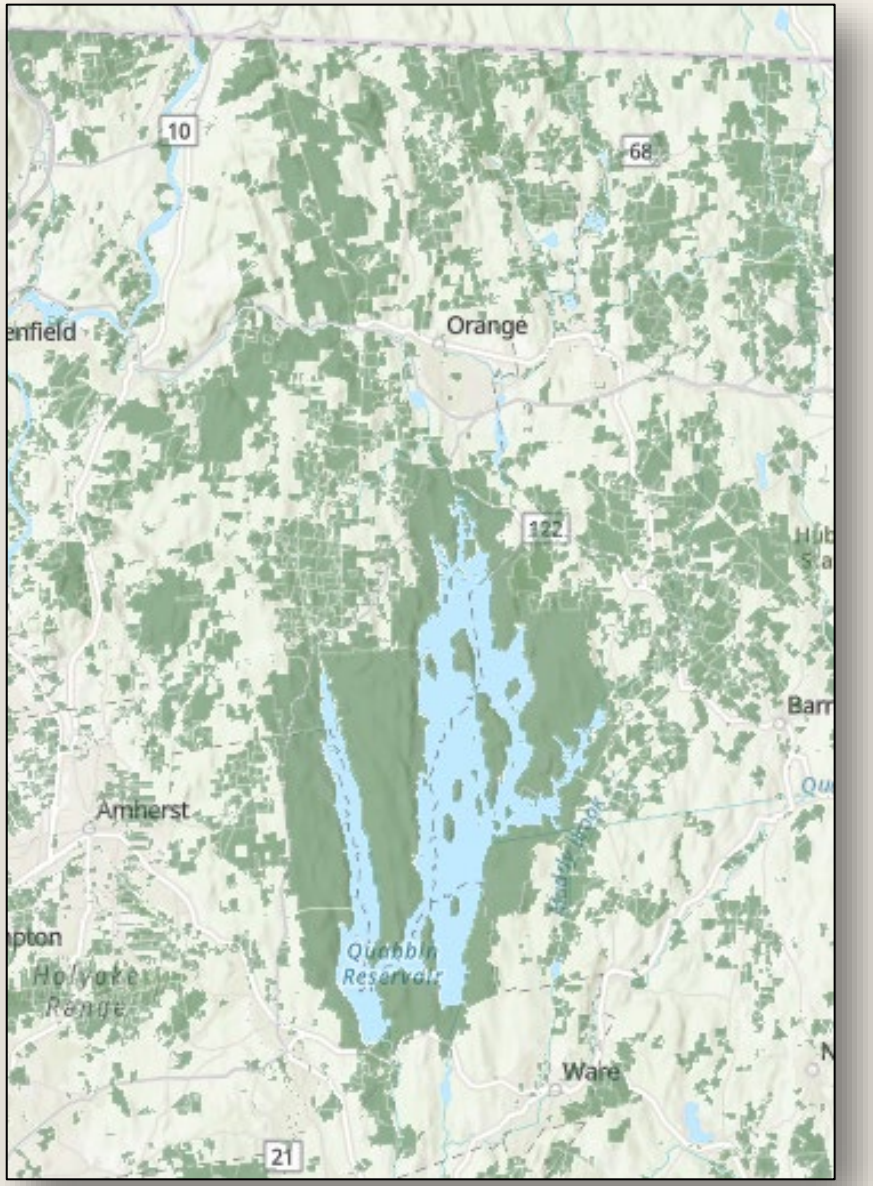
Creates larger interior-forest blocks that buffer core areas from outside impacts.

Strengthens ecological connectivity and wildlife movement.

Improves long-term resilience for biodiversity, aquatic systems, and ecosystem function.

Illustrative focus: Quabbin-region connectivity

A corridor of protected forest from Route 9 toward the New Hampshire border shows how reserves can reinforce broader, diverse conservation management.

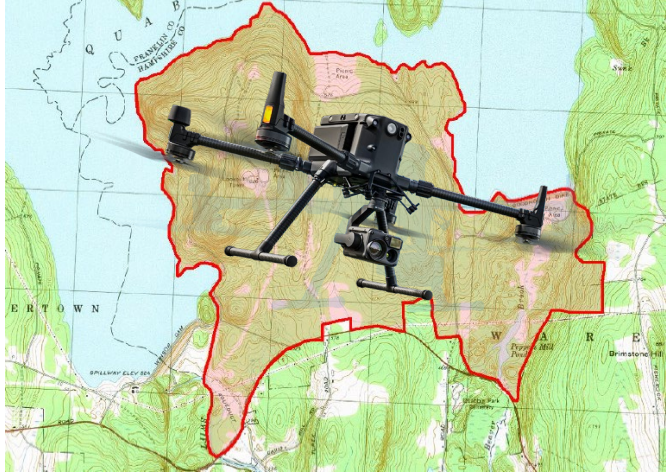


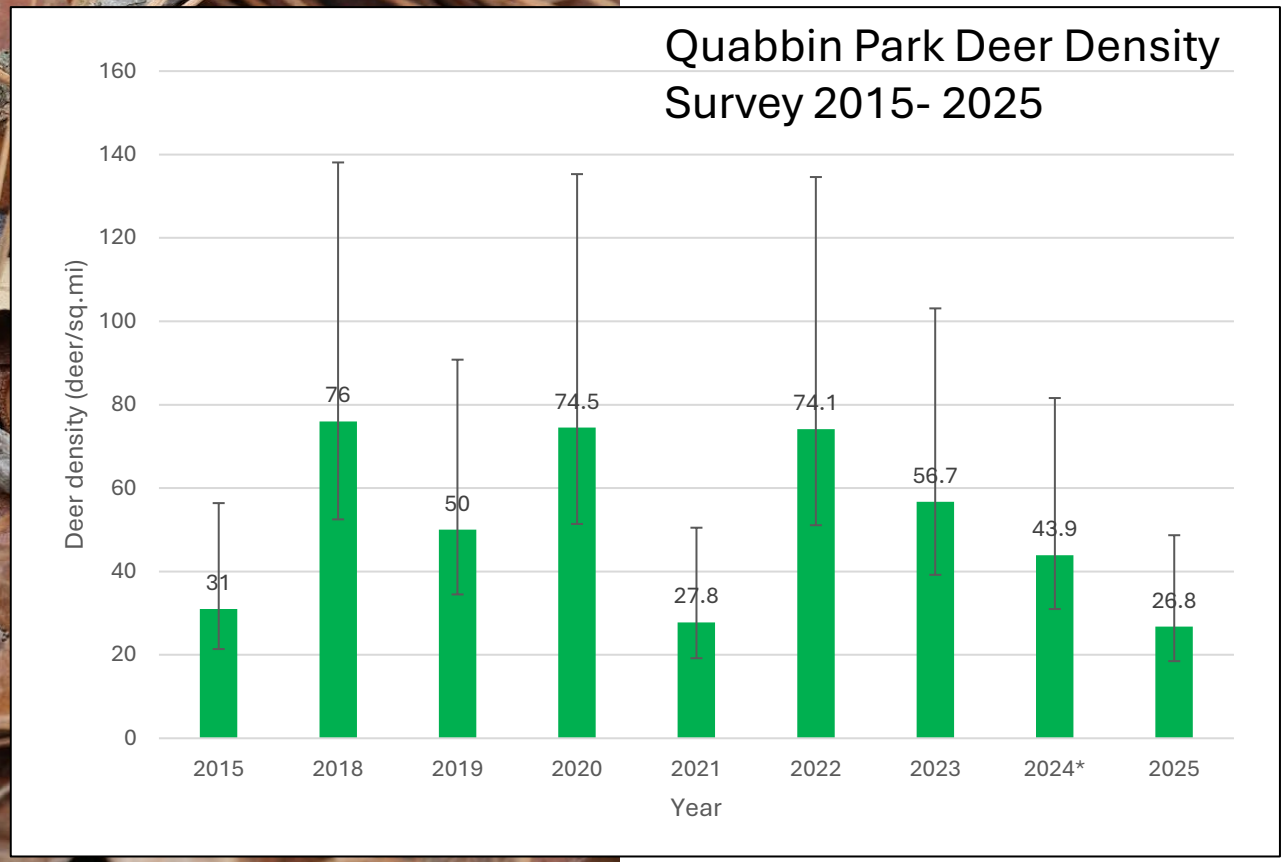
massDOT
Massachusetts Department of Transportation
Aeronautics Division

dcr
Massachusetts

Using Thermal Imagery to Estimate Deer Density in Quabbin Park

Ken MacKenzie
Director of Natural Resources




Quabbin Park Deer Density Survey 2015- 2025
Deer density (deer/sq.mi)
160
140
120
100
80
60
40
20
0
31
76
50
74.5
27.8
74.1
56.7
43.9
26.8
2015
2018
2019
2020
2021
2022
2023
2024*
2025
Year

So how do we feel about this technique and its reliability?

2025 Results

2025 **Pellet Survey** Density Estimate:

- Quabbin Park: Spring of 2025
  - 26.8 (19.9 – 52.5 deer/ mi^2)

2025 Drone Pre-hunt Survey Estimate

- Flights: November 24 and December 1st 2025
  - 24.4 - 32.7 deer/ mi^2

2025 Quabbin Park Hunt: Monday Dec 8th and Tuesday Dec 9th

- Harvest of **24 deer** (reduction of 6 deer/ mi^2)

2025 Drone Post-hunt Survey Estimate

- Flights: Wednesday December 17th and Monday, January 12th
  - 12.19 – 16.26 deer/ mi^2
  - • Post-harvest reduction of 12.21-16.44 deer/ mi2 (>60% reduction)