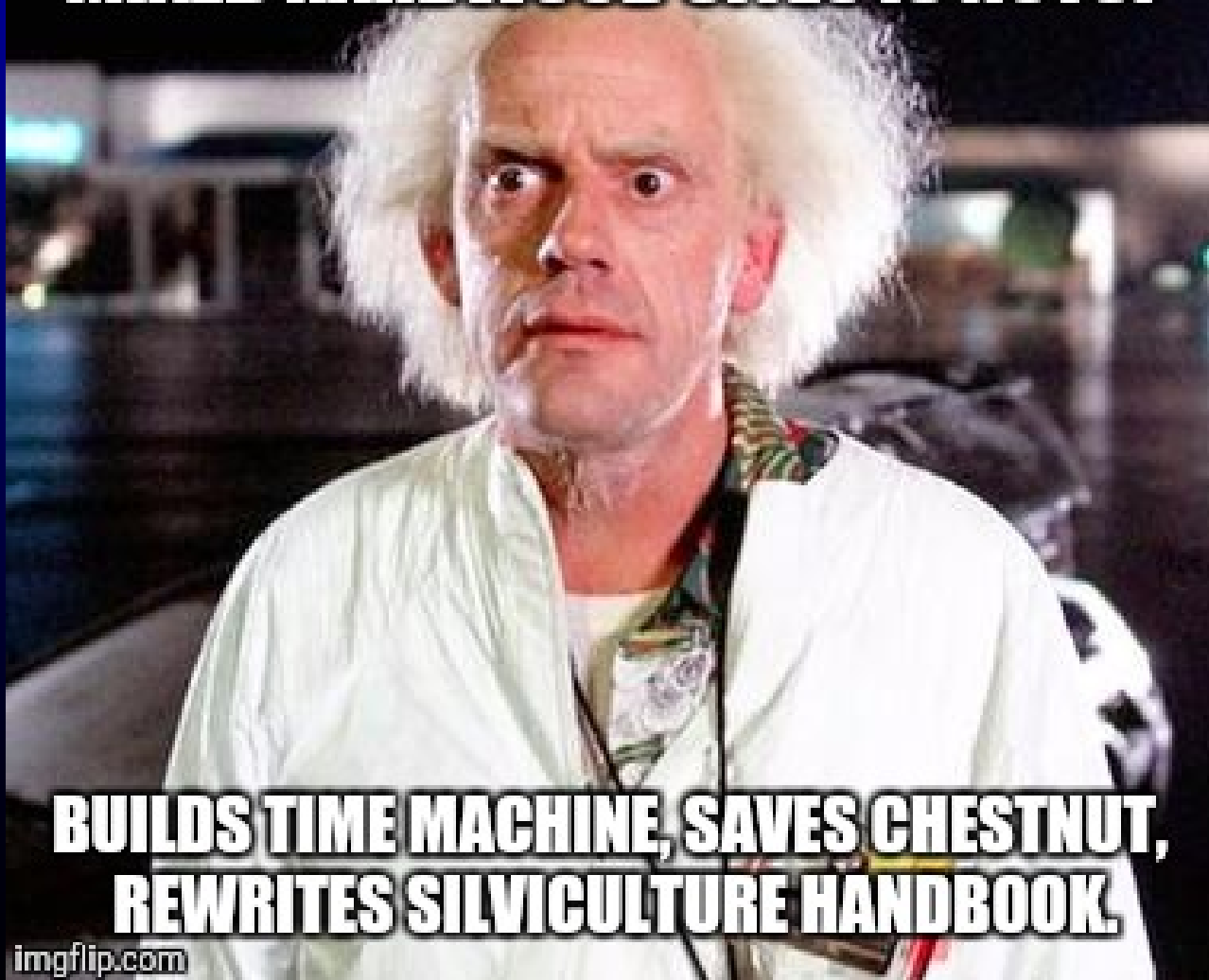


A photograph of a person wearing a red jacket, orange beanie, and camouflage pants walking on a snowy path in a forest. A black bear is visible in the background on the left side of the path. The trees are mostly bare, suggesting a winter or late autumn setting.

Wandering

Jeffrey S. Ward, Station Forester
Department of Forestry & Horticulture
Connecticut Agricultural Experiment Station
New Haven, Connecticut

**SAYS MANAGING FOR OAK ON MESIC
MIXED HARDWOOD SITES IS NUTS!**



**BUILDS TIME MACHINE, SAVES CHESTNUT,
REWRITES SILVICULTURE HANDBOOK.**

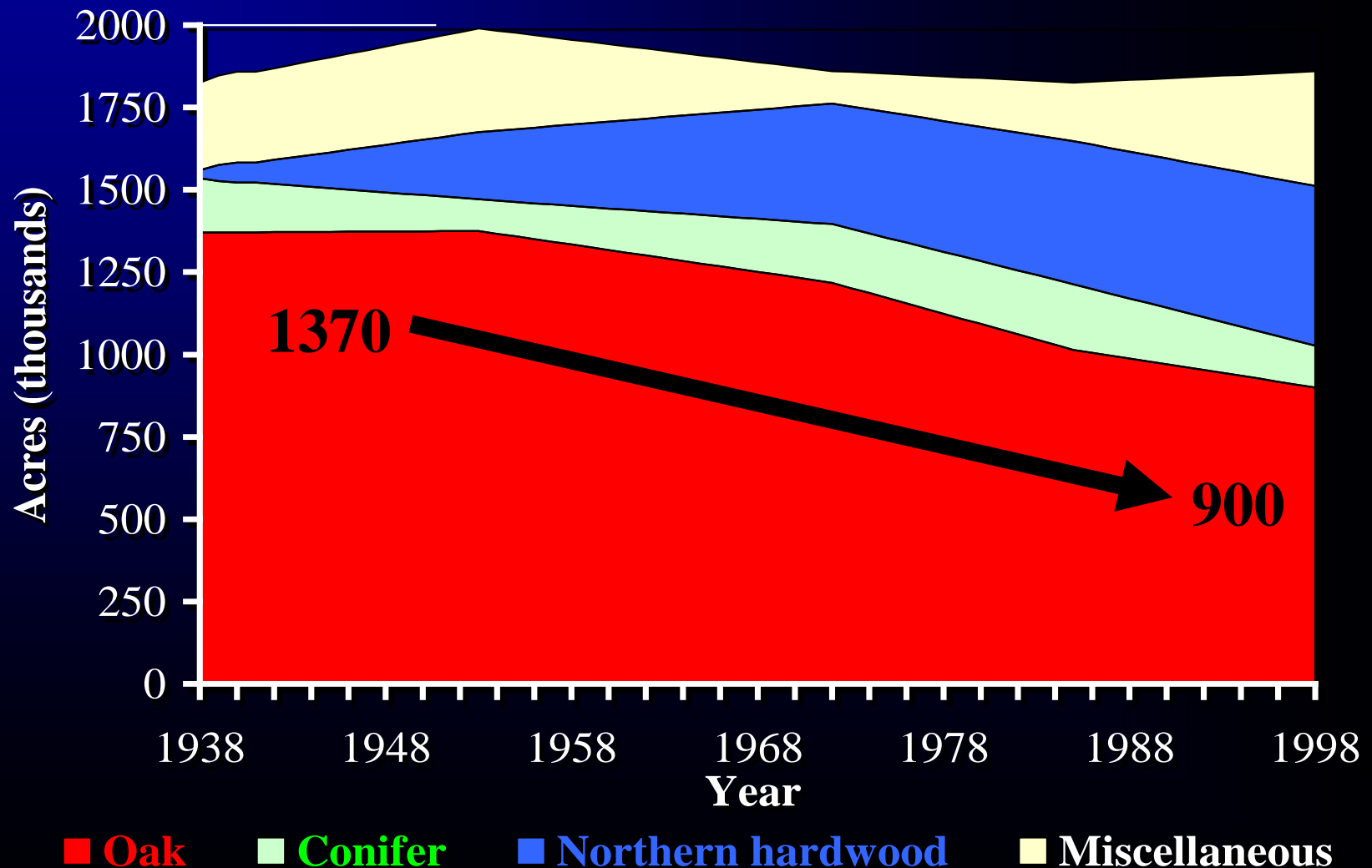
imgflip.com

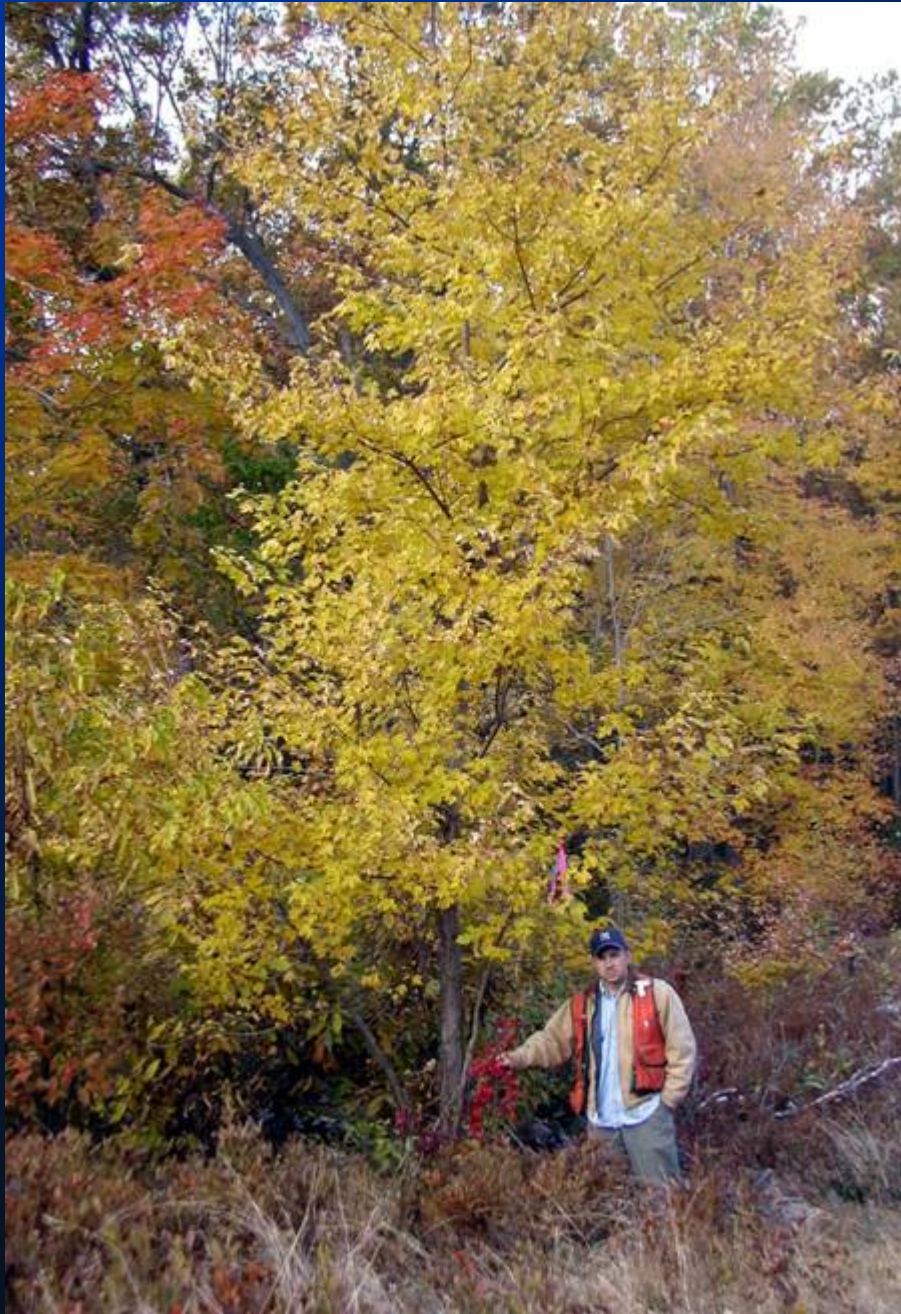


Overlook

- Oak regeneration and deer
- Oak stump sprouting
- Rehabilitation of high-graded stands

Connecticut's forest is changing





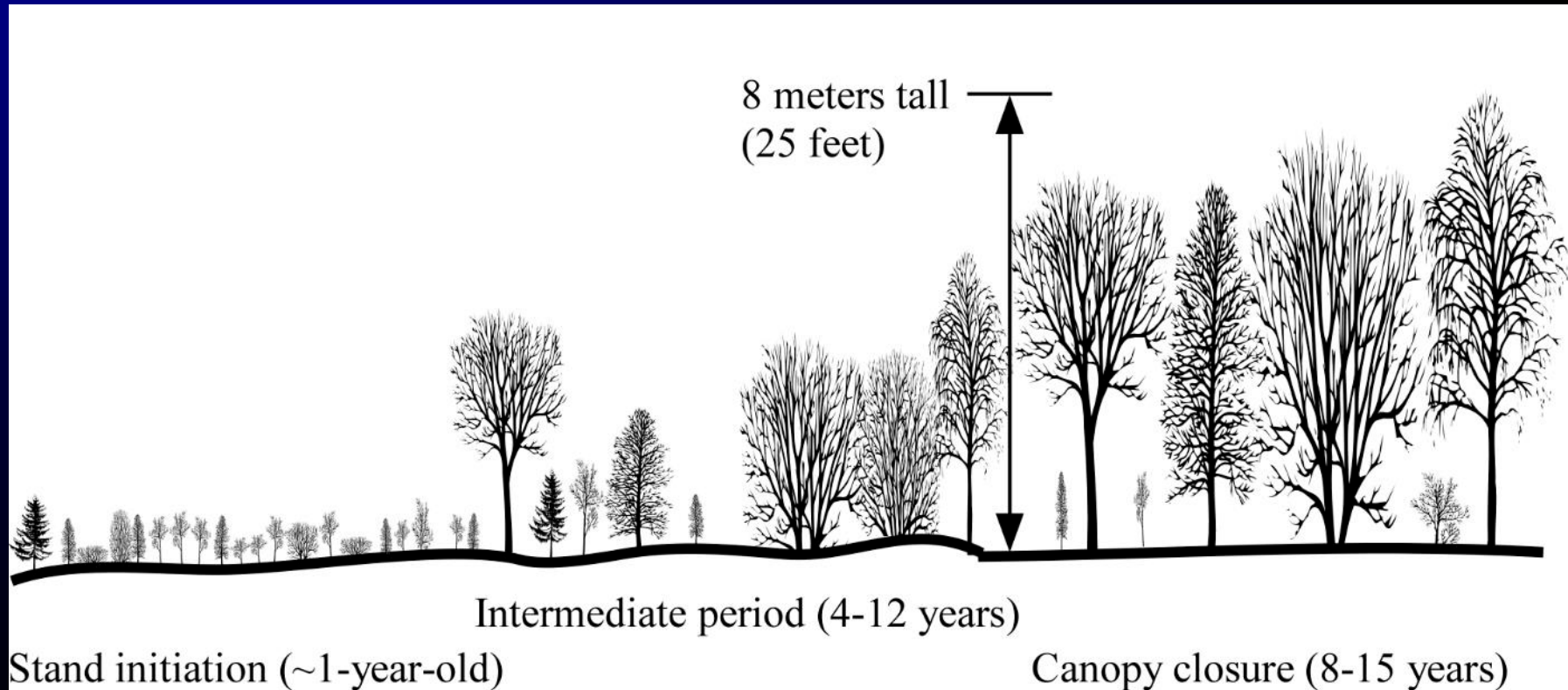
The Challenge

Oak regeneration on better quality sites is often hampered by taller red maple and birch that develop in earlier phases of stand management, especially after thinning and “selection” harvests.

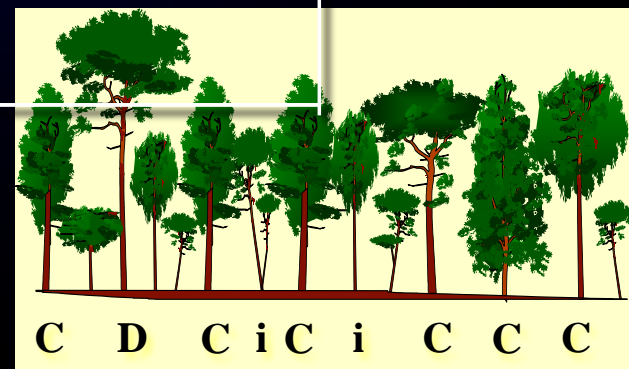
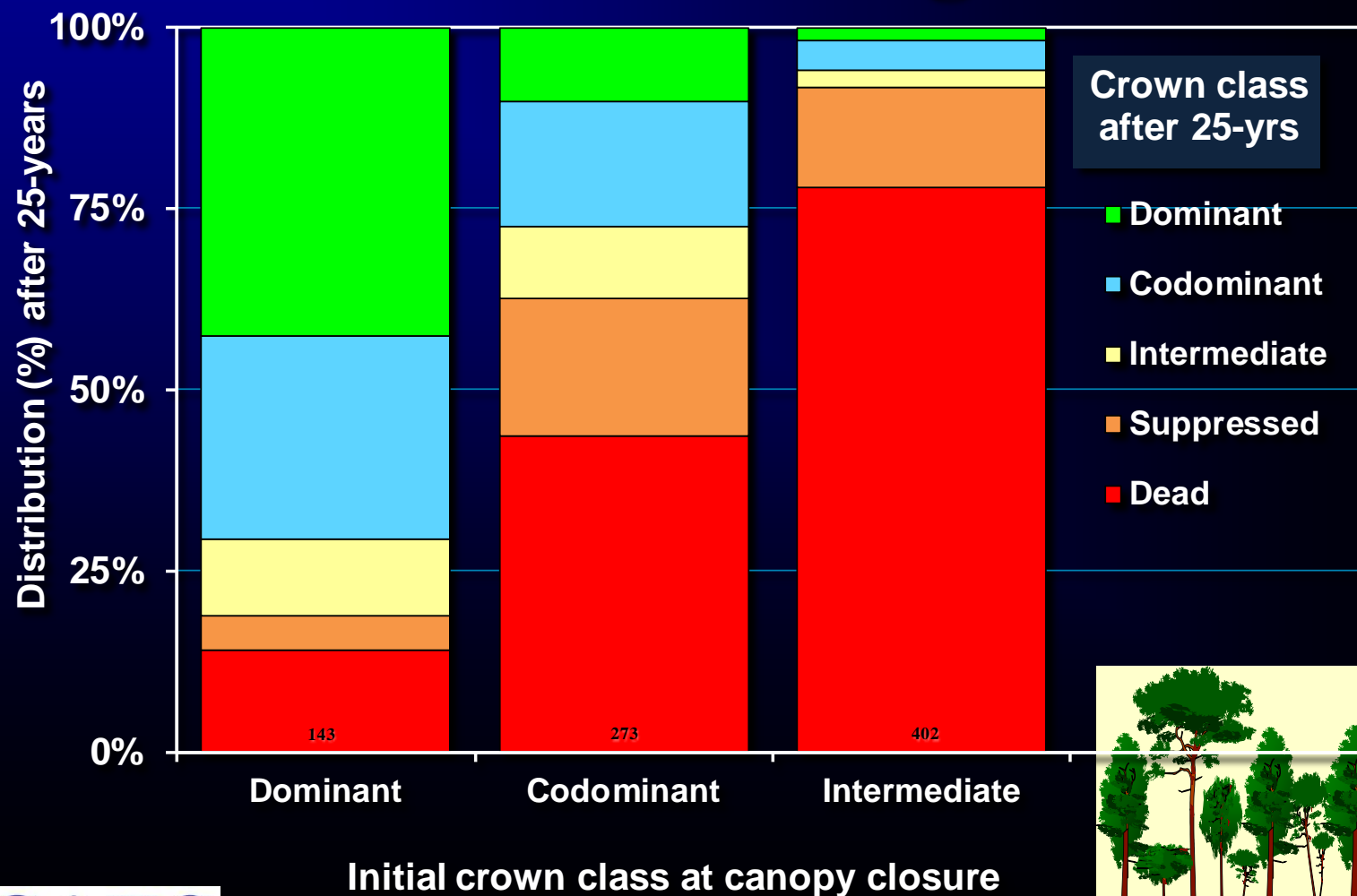


7-year-old sand

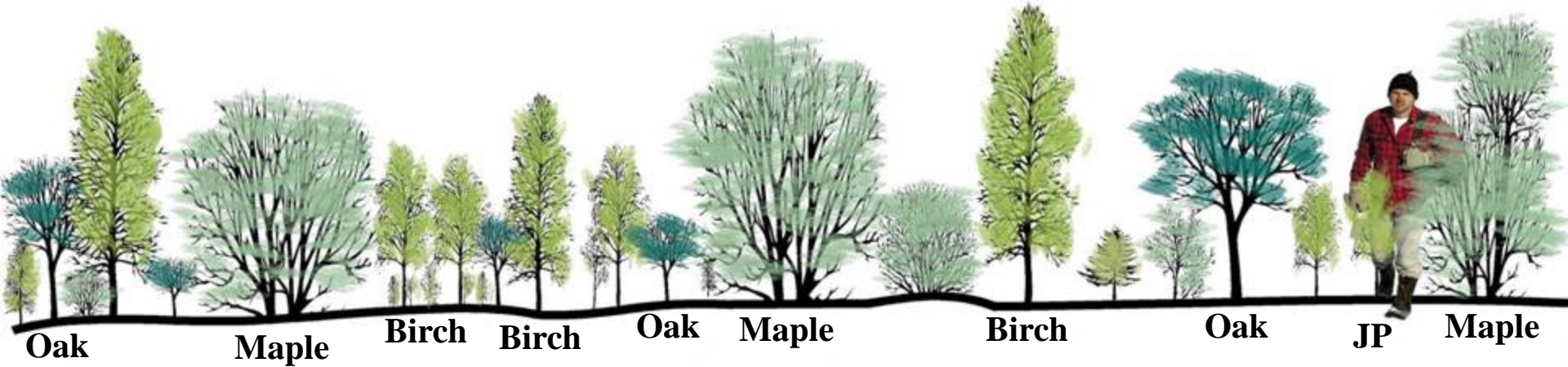
Canopy closure begins the crucial period of rapid self-thinning



Without release – most codominants & intermediates regress or die



Upland oaks



Oak regeneration assessment



Oak Regeneration Study

108 stands

2210 points

4484 acres

~ 2.0 acres per point





- 10-factor prism of residuals
- Cover of ferns, shrubs, overstory, midstory
- Will incorporate soils, LIDAR topo parameters



Regeneration I

(1/1000 ha, ~1/400 acre)

All stems ≥ 3 feet

- Species
- Height class (3-6 ft, 6-9 ft, >9 ft)
- Free-to-grow (or not). In shelterwoods – presumed residuals would be cut



Regeneration II

(1/2,500 ha, ~milacre)

Oak, hickory, or eastern white pine 1-3 feet tall

- **Species**
- **Height class (1-3 ft)**
- **Free-to-grow (or not)**





Open
< 25ft²/acre (n=32)

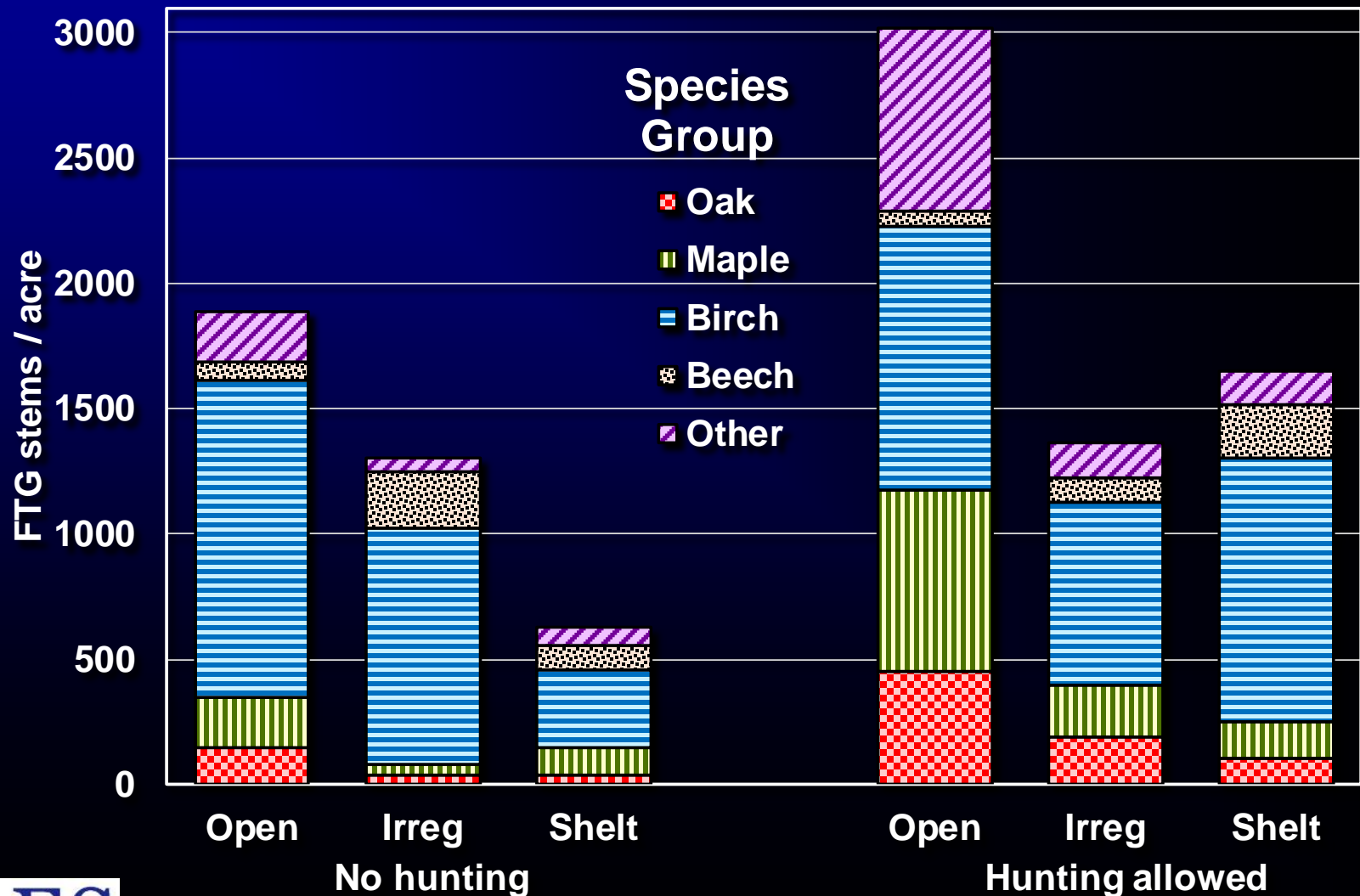


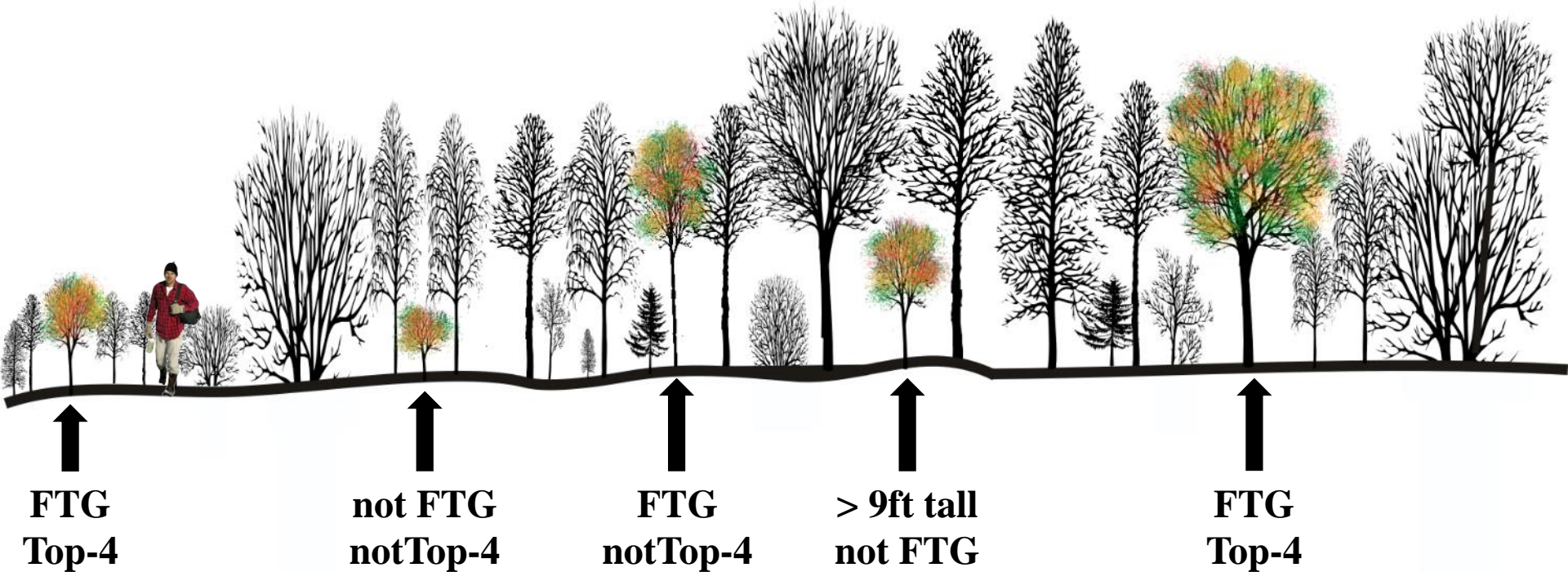
Irregular shelterwood
25-50 ft²/acre (n=45)



Shelterwood
50-90 ft²/acre (n=31)

Birch is the future





Top 4 trees

- Largest four (4) trees capable of forming part of upper canopy in a mature forest
- Had to be free-to-grow, no minimum height
- Could be fewer than four

Free-to-grow vs. Top-4

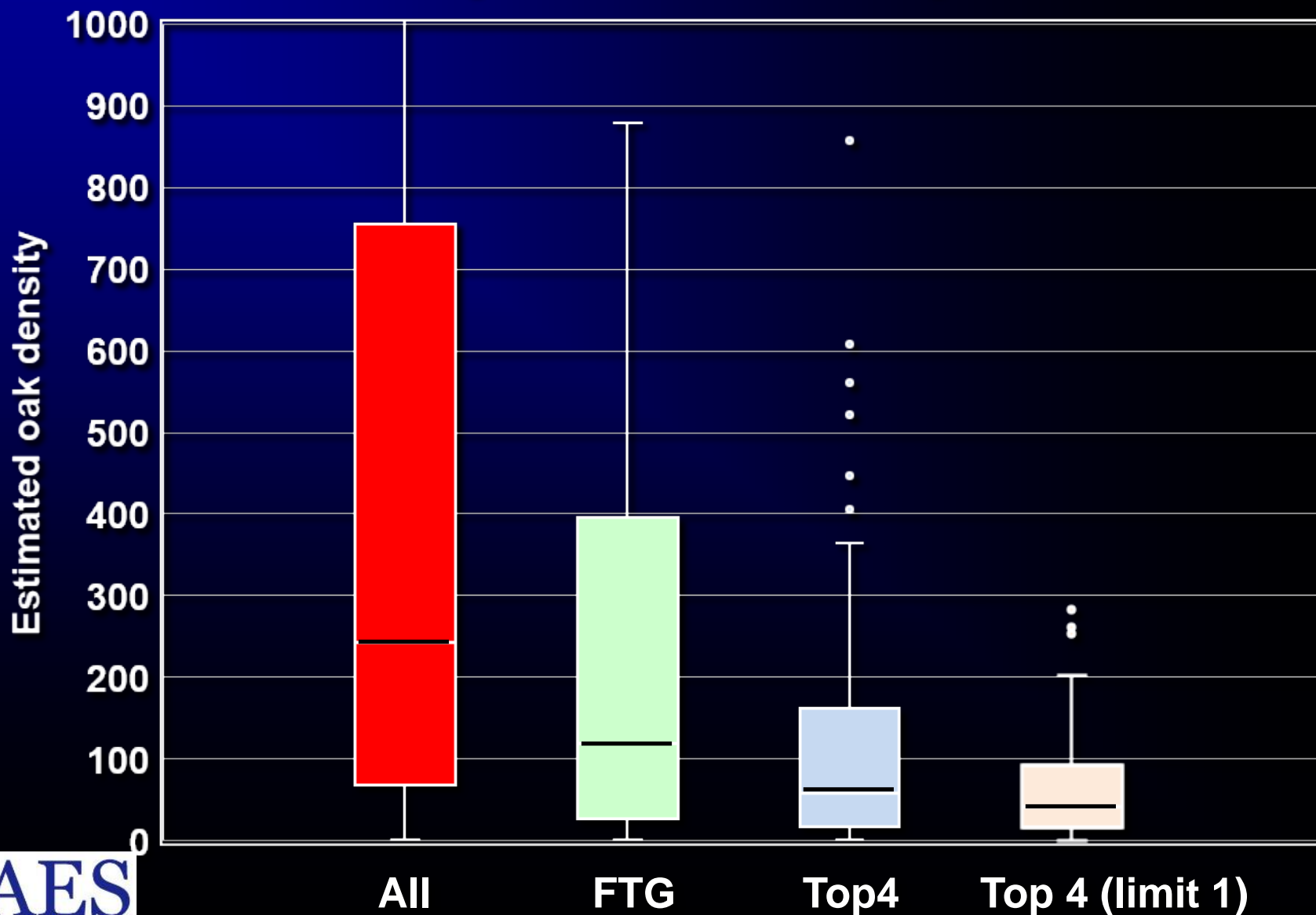


Free-to-grow, not Top-4



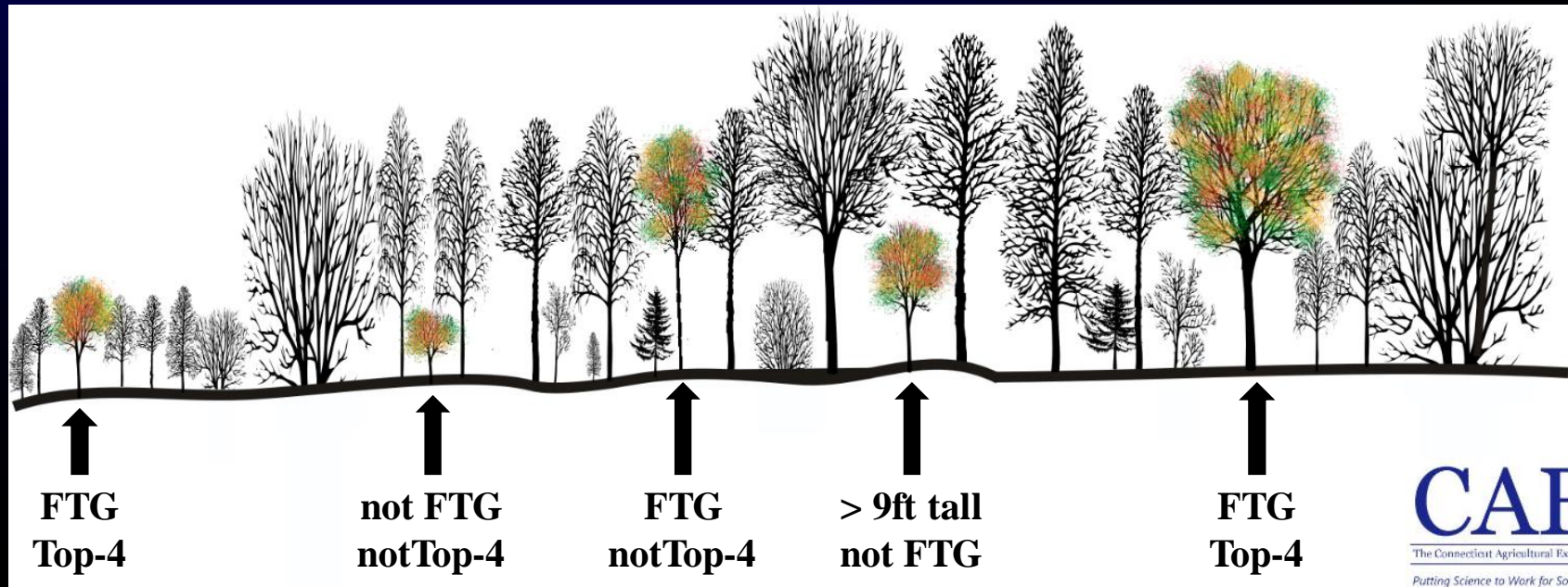
Top-4

Oak density estimates by method



Caveats for following

- Each 1/400 acre plot with a Top-4 oak will have an oak in upper canopy at canopy closure that will then persist through stand maturity.
- But, each 1/400 acre plot can only have one upper canopy oak that persists.



Caveats for following

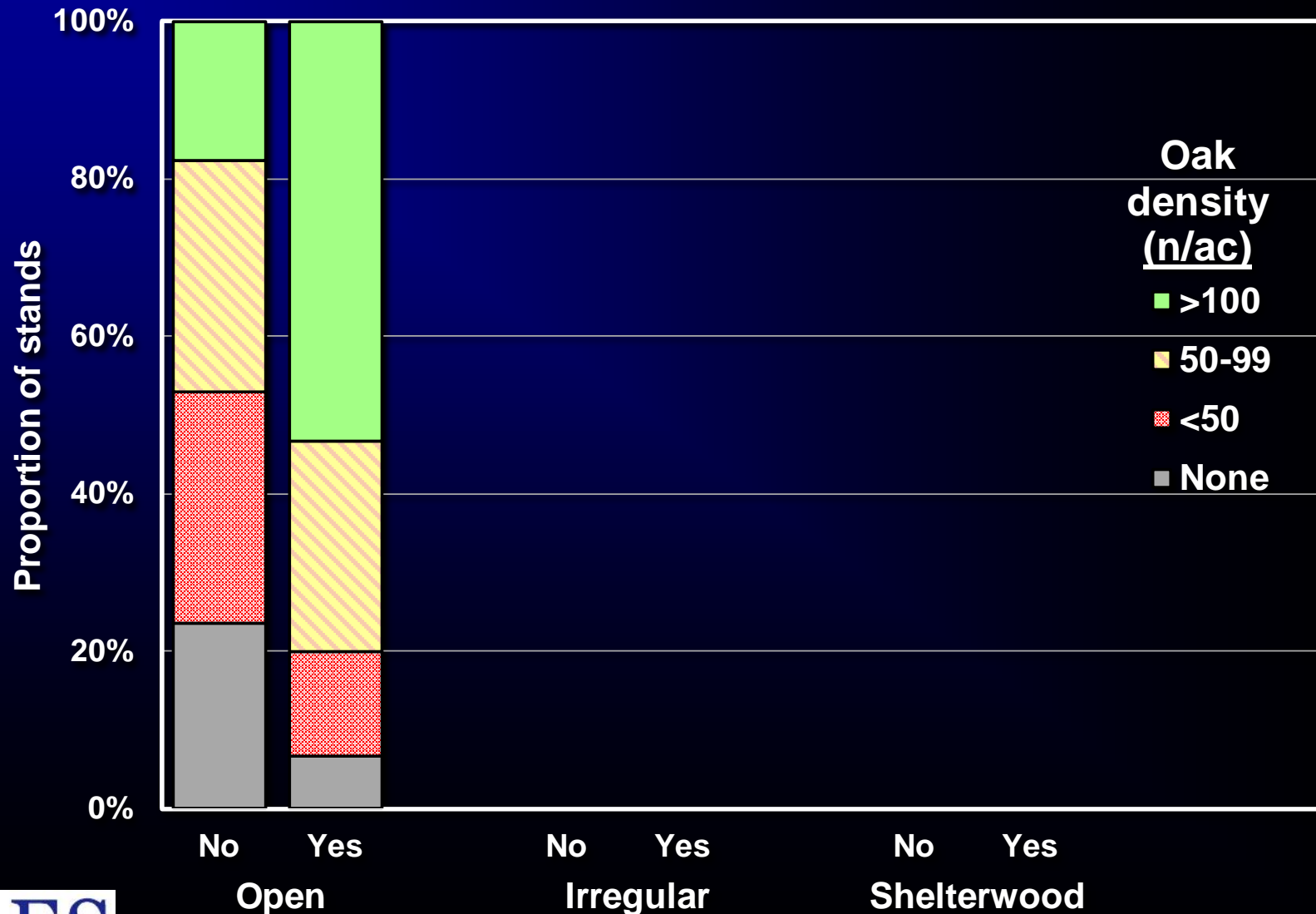
- Each 1/400 acre plot with a Top-4 oak will have an oak in upper canopy at canopy closure that will then persist through stand maturity.
- But, each 1/400 acre plot can only have one upper canopy oak that persists.

A little math ...

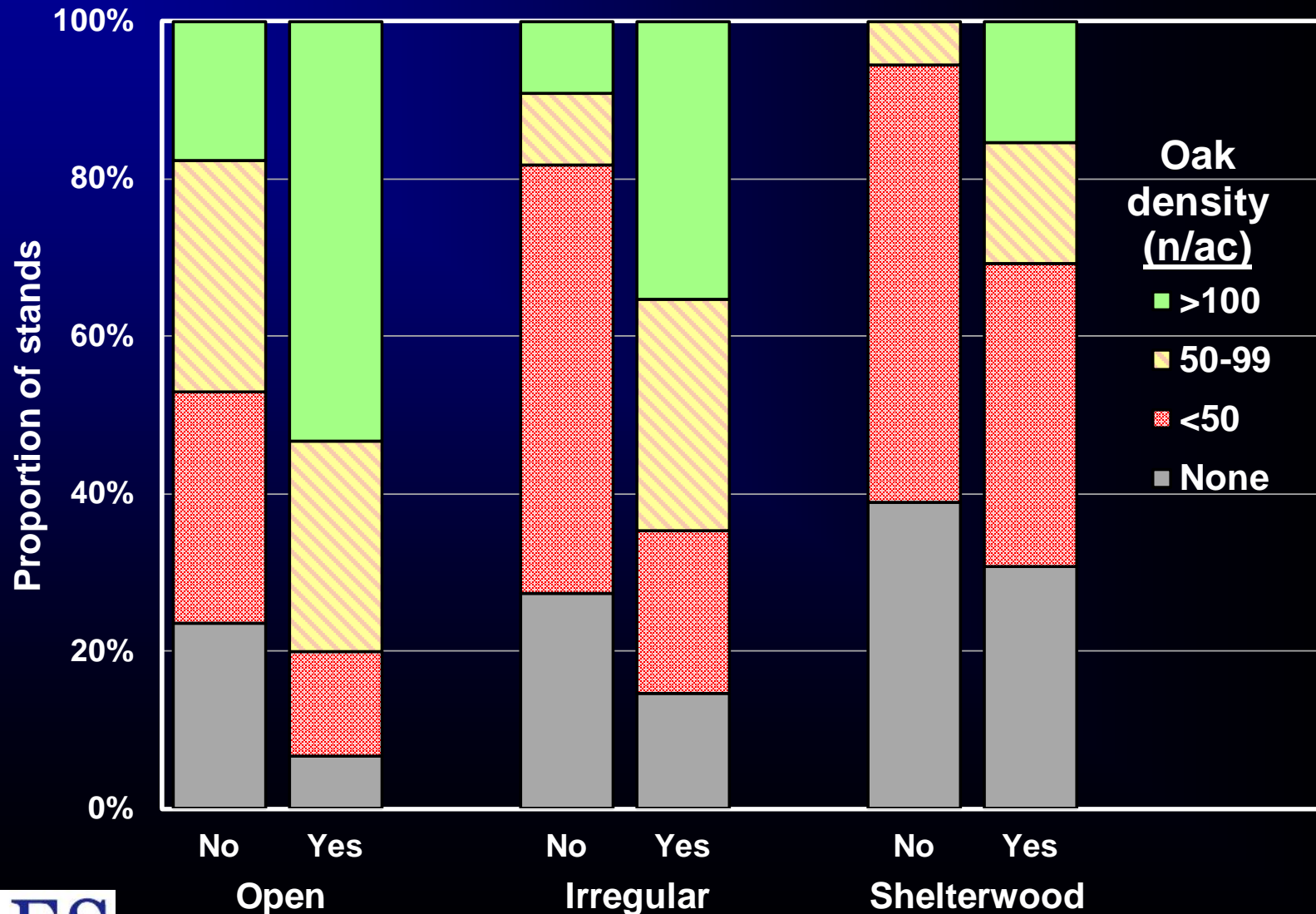
Expected oaks/acre =

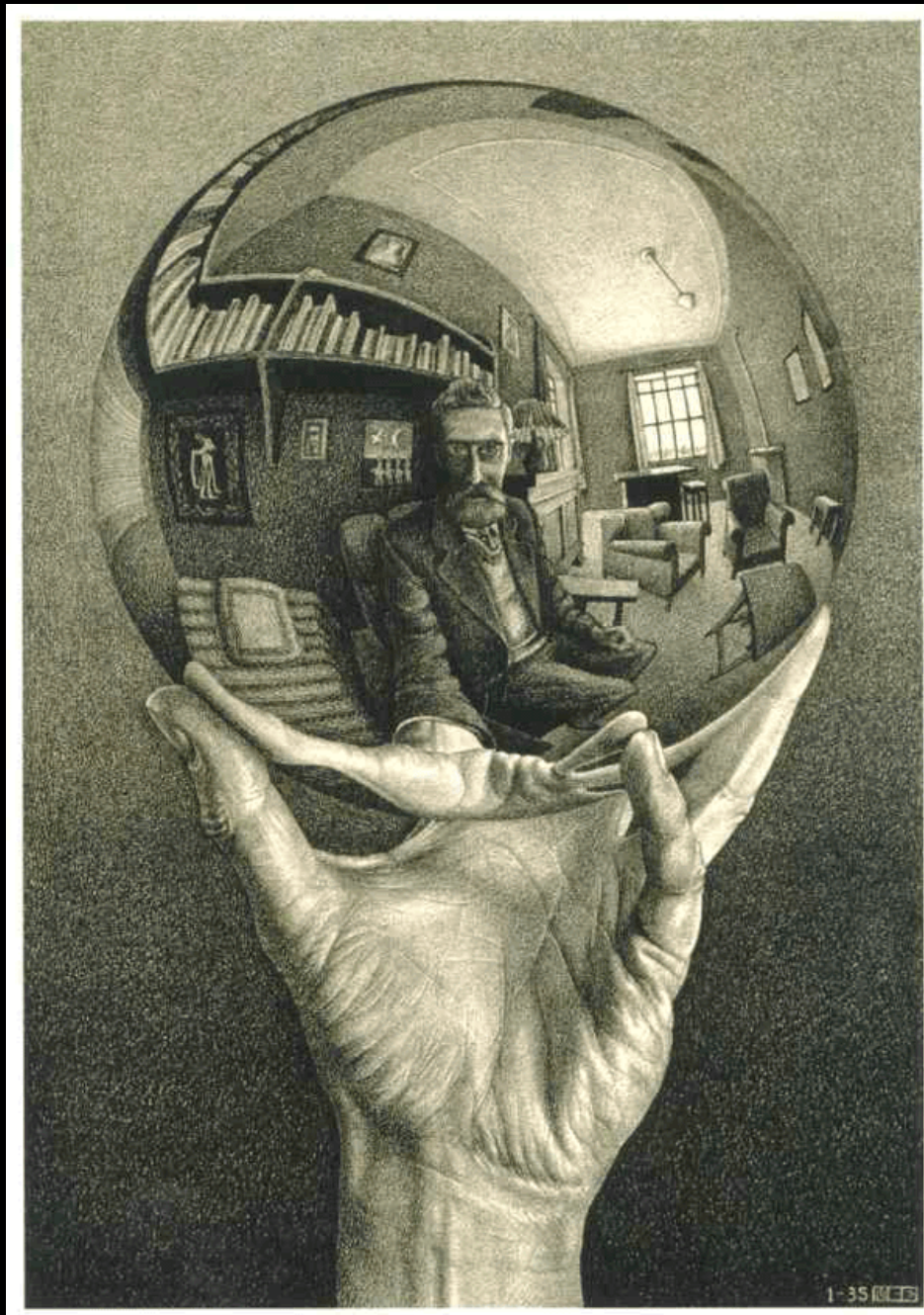
(% points with a Top-4 Oak) * 400

Hunting increases oak

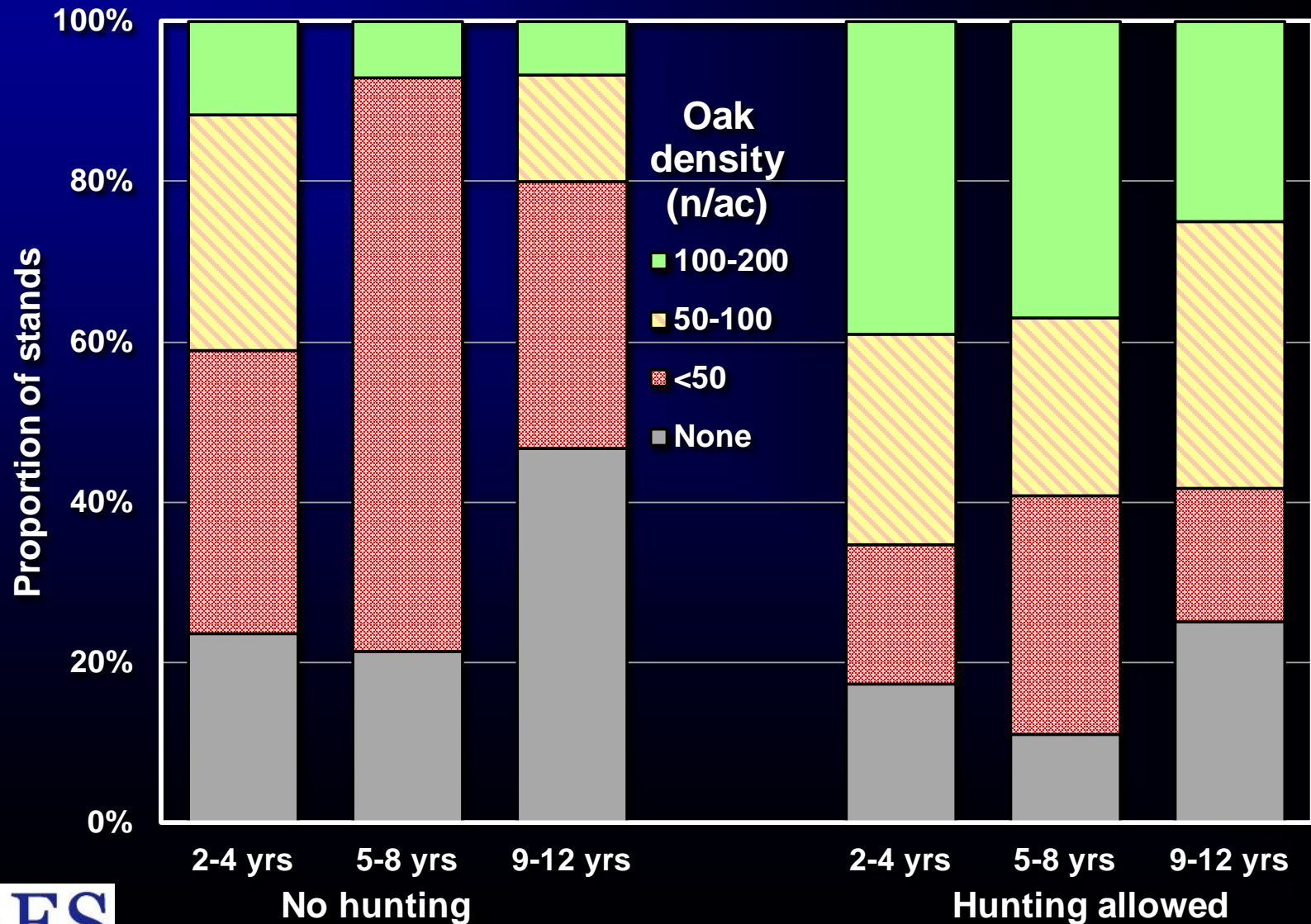


Overstory density not so good





Oak fades without hunting



Bad advice if you want oak



**No fires
in forest**

**Leave
the trees**



**Don't
hunt**

Jeff Ward

CAES – New Haven

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jeffrey.ward@ct.gov



CAES

The Connecticut Agricultural Experiment Station

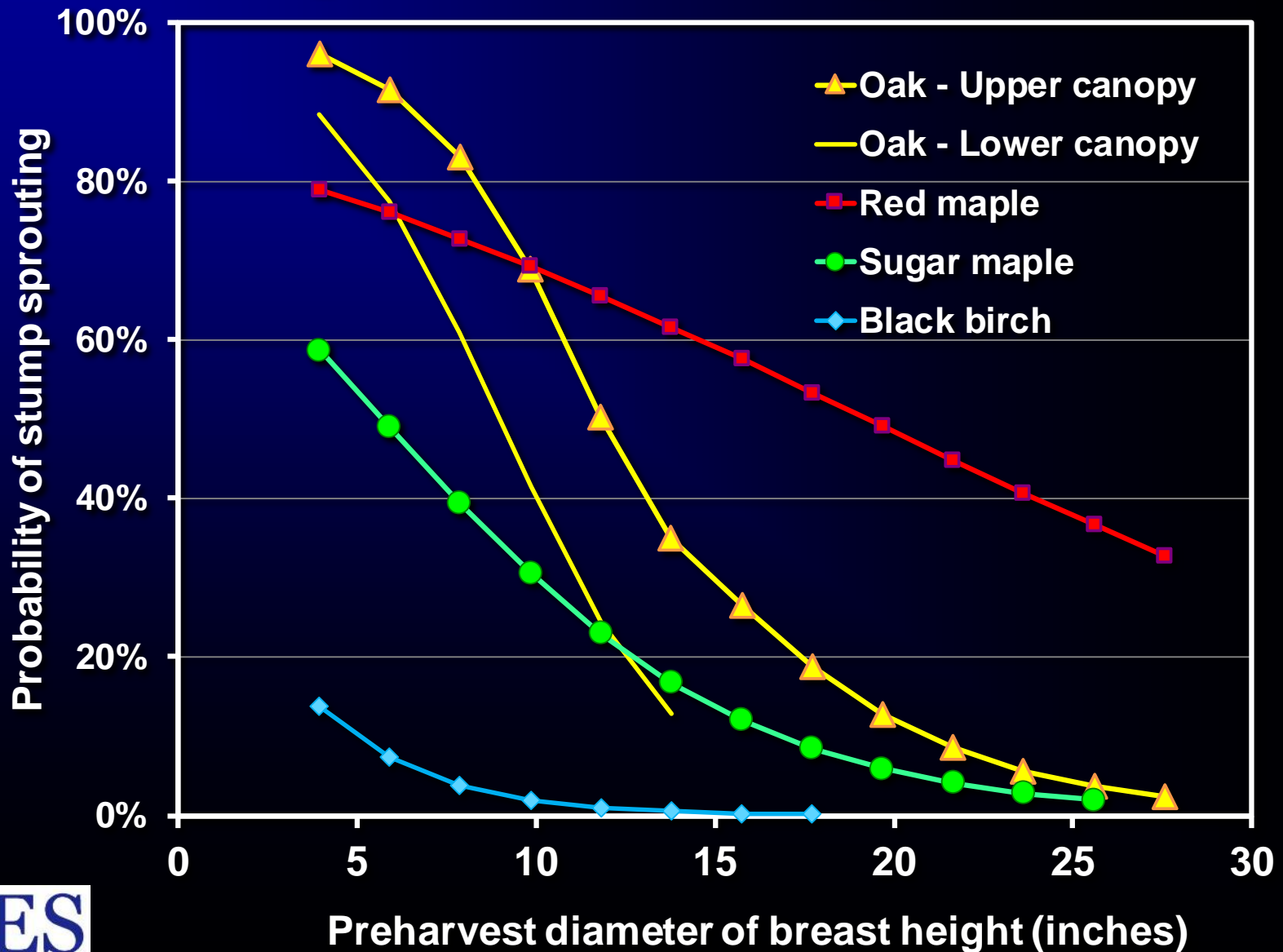
Putting Science to Work for Society since 1875





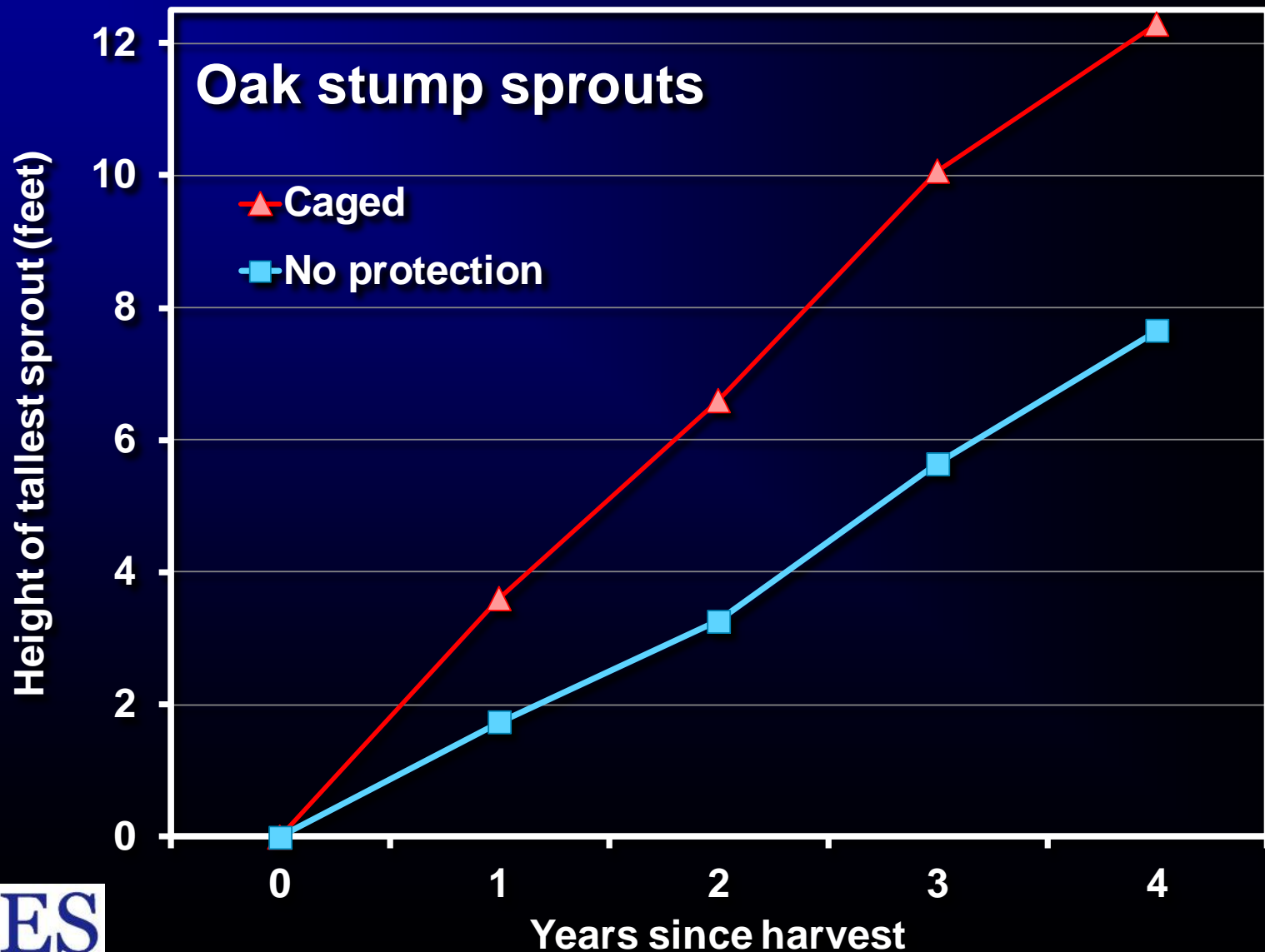
4-yr-old sprout

Big oaks don't sprout

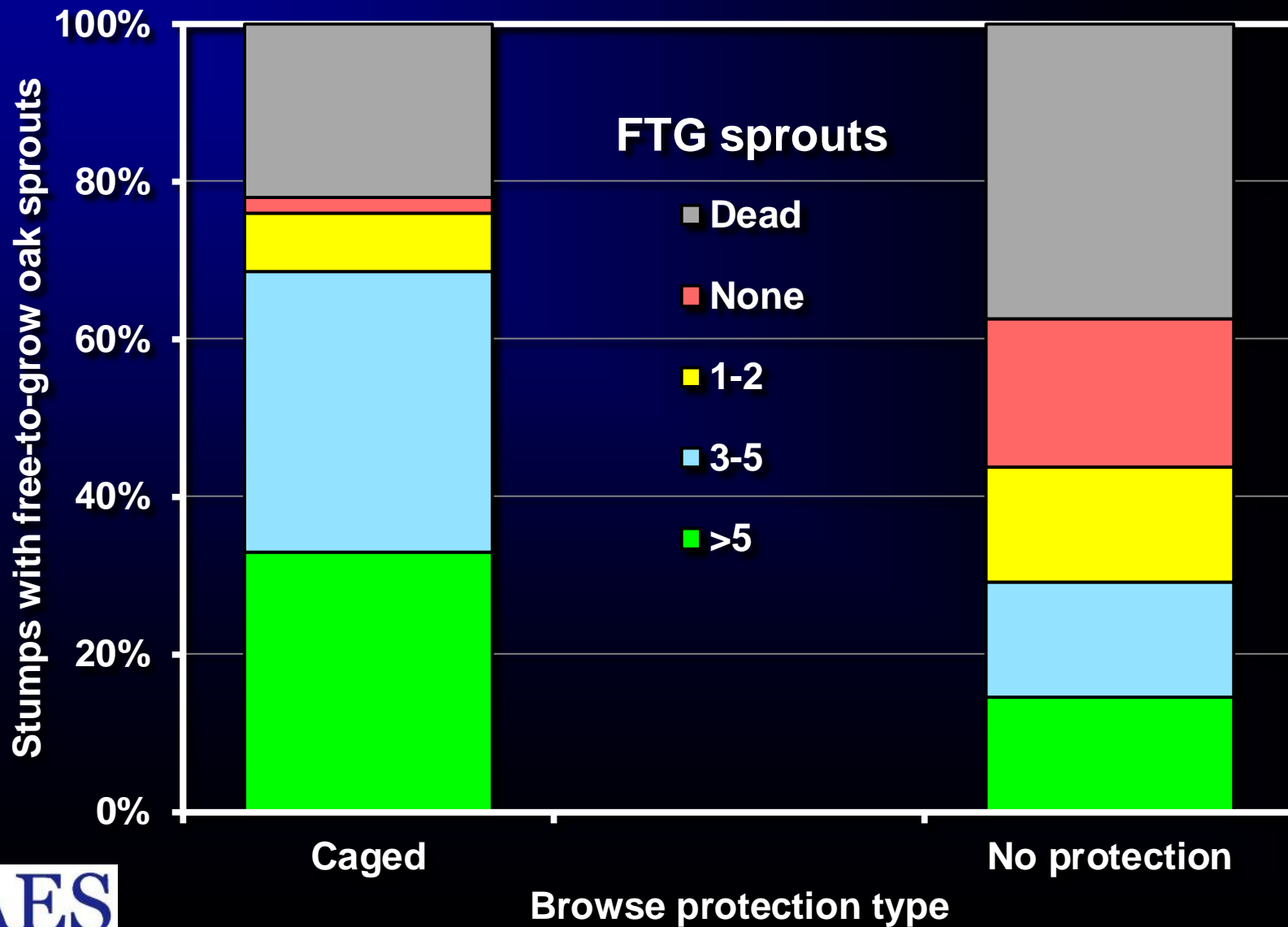




Browse slows growth just enough

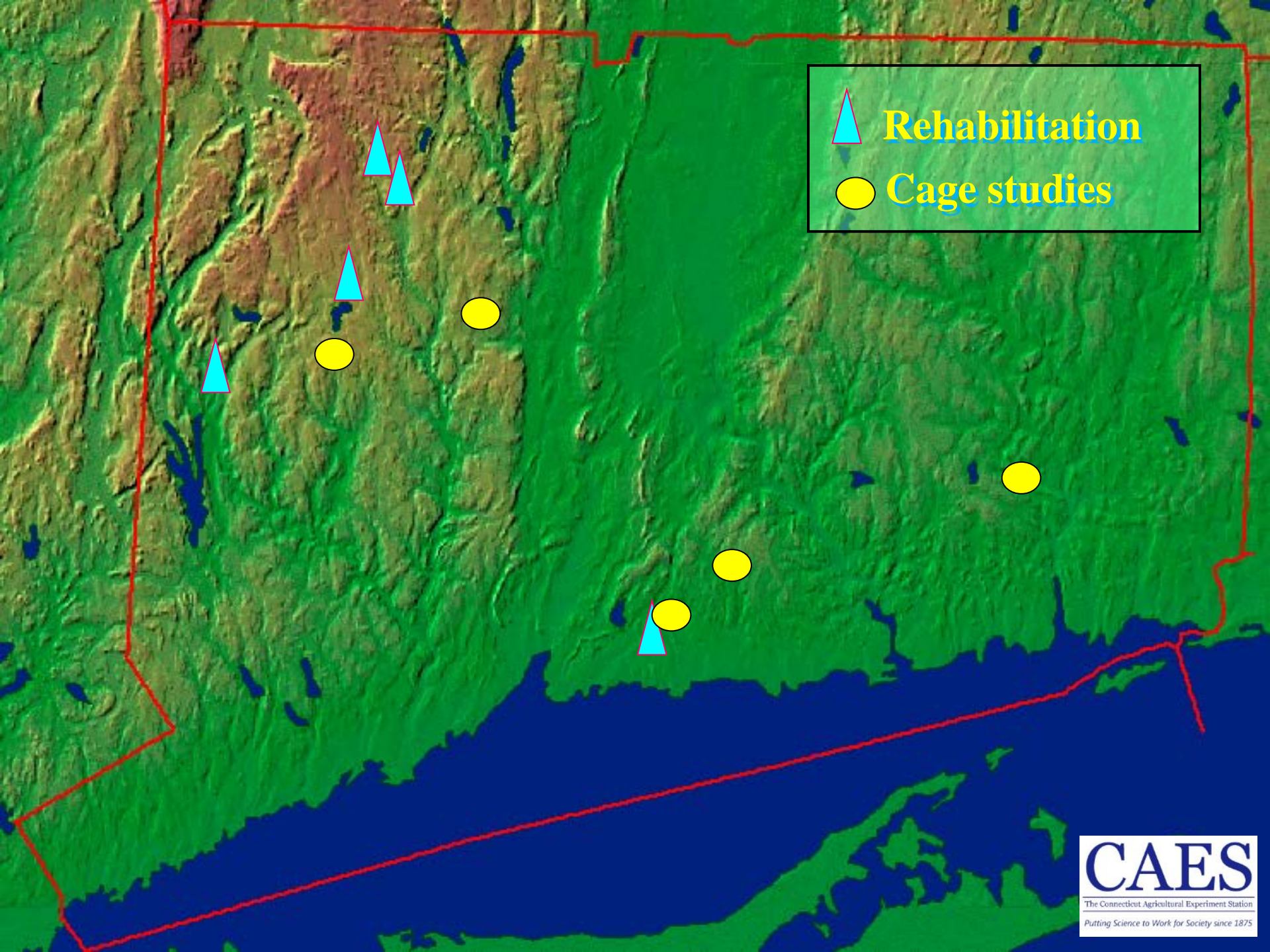


A little browse damage ...



Forest Rehabilitation





Rehabilitation



Cage studies

Decision chart

Low intensity rehabilitation

INITIAL PLOT CONDITION

PRESCRIPTION GOAL

Poletimber plot

At least five well-spaced quality poletimber trees

Yes

Cut larger competitors of five to ten target poles

No

Ten well-spaced saplings of desirable species

Yes

Sapling plot

Cut all poles and culls

No

Two to four well-spaced quality poletimber trees

Yes

Two-aged plot

Cut all poles and culls except target poles

No

Regeneration plot

Advanced regeneration or saplings of desirable species present

Yes

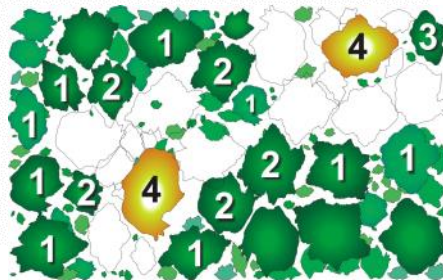
Release regeneration

Cut all poles and culls

No

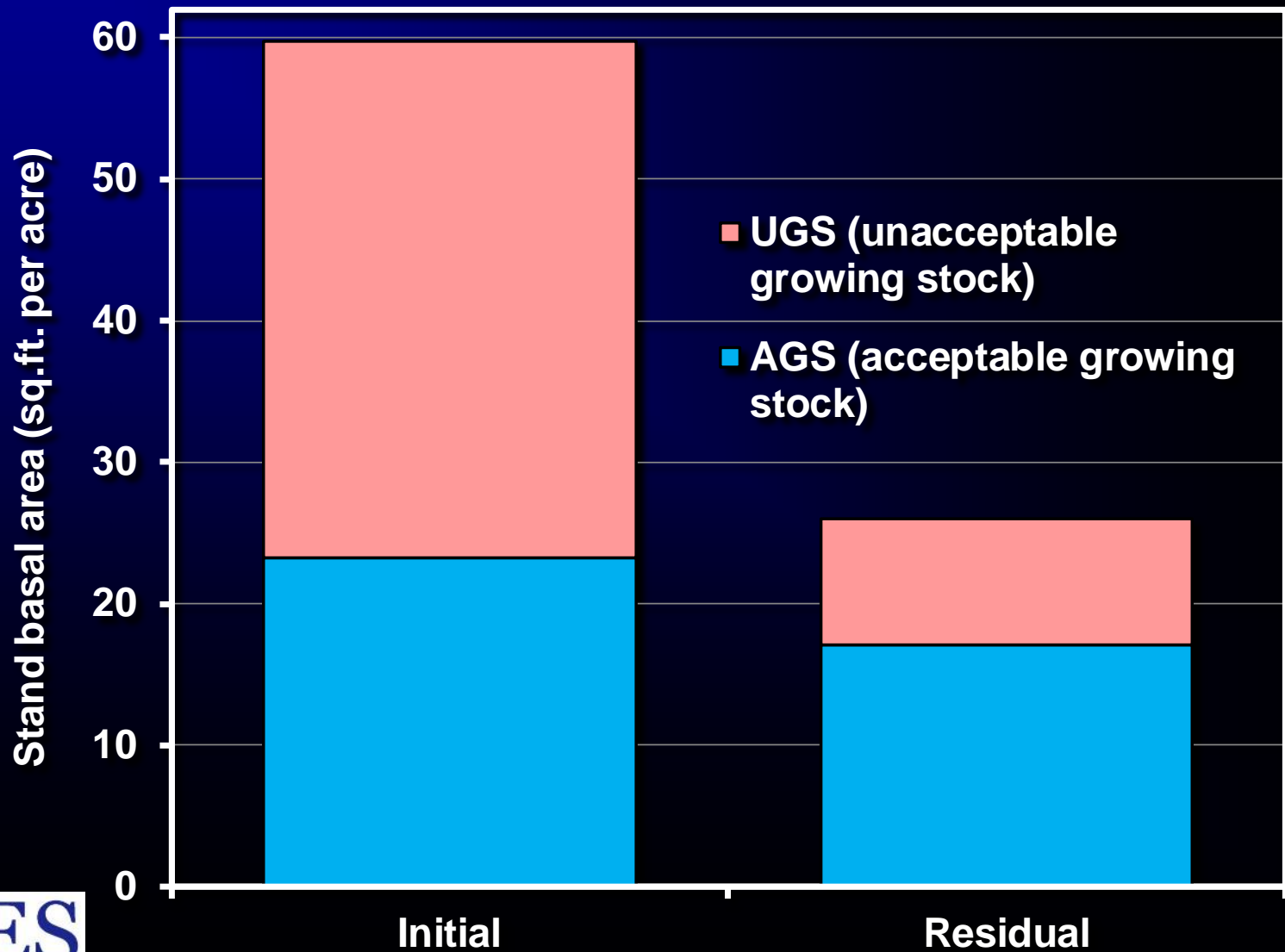
Initiate regeneration

Cut all culls and poles except those retained as seed source; broadcast control of interfering vegetation if needed.



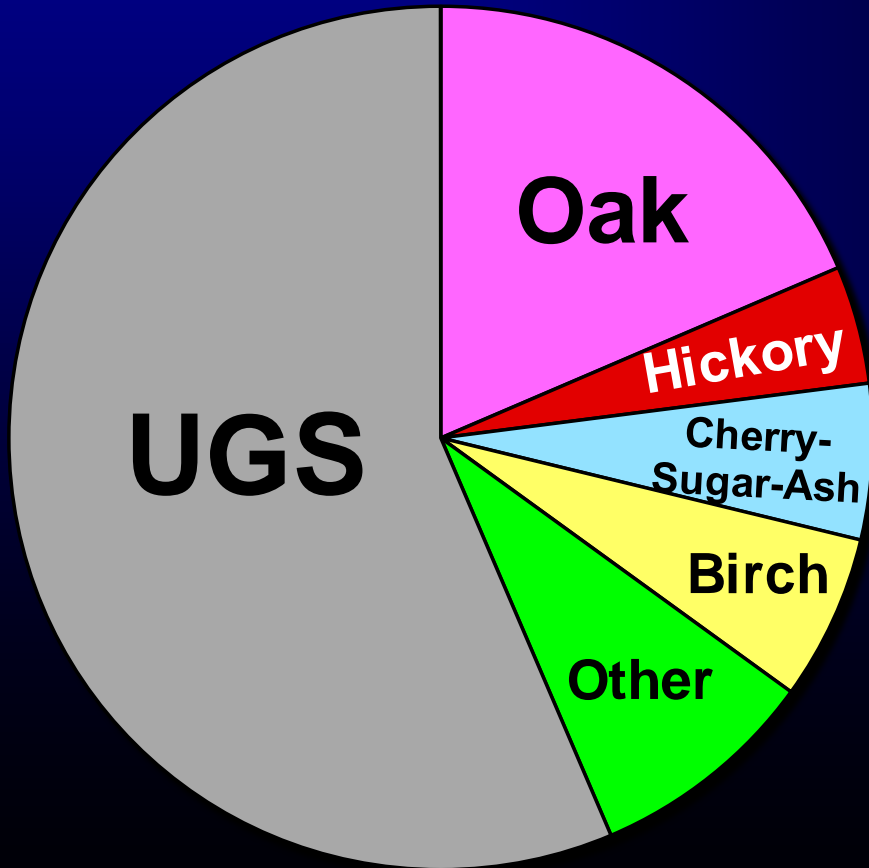
1/10 acre plots,
~30 ft radius

We removed most of UGS

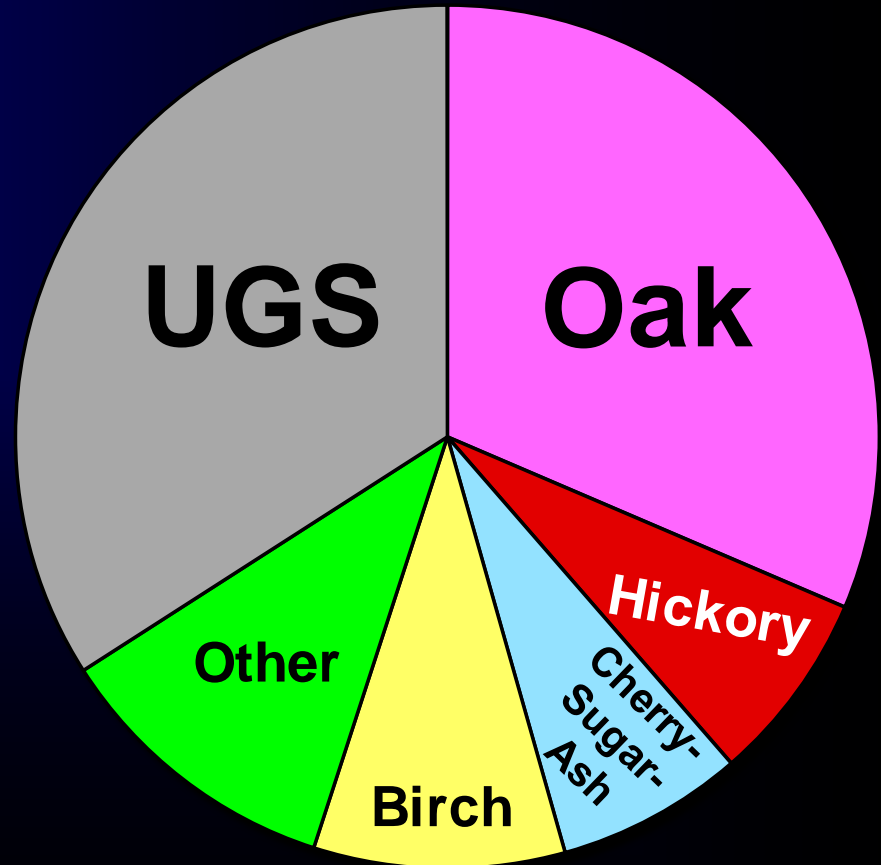


Release improved stand composition

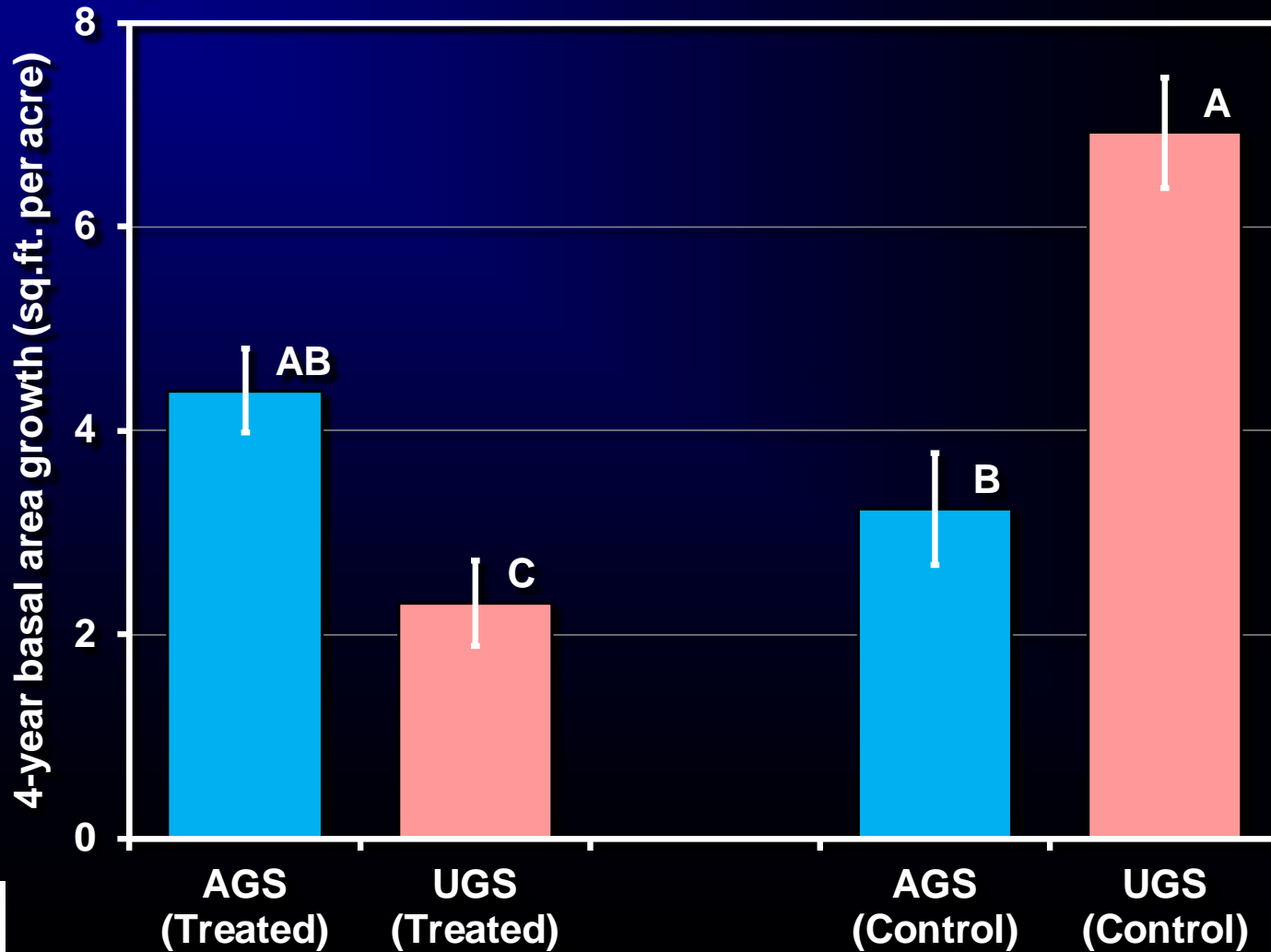
Pre-treatment




Post-treatment



Release increased stand AGS growth relative to UGSs





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