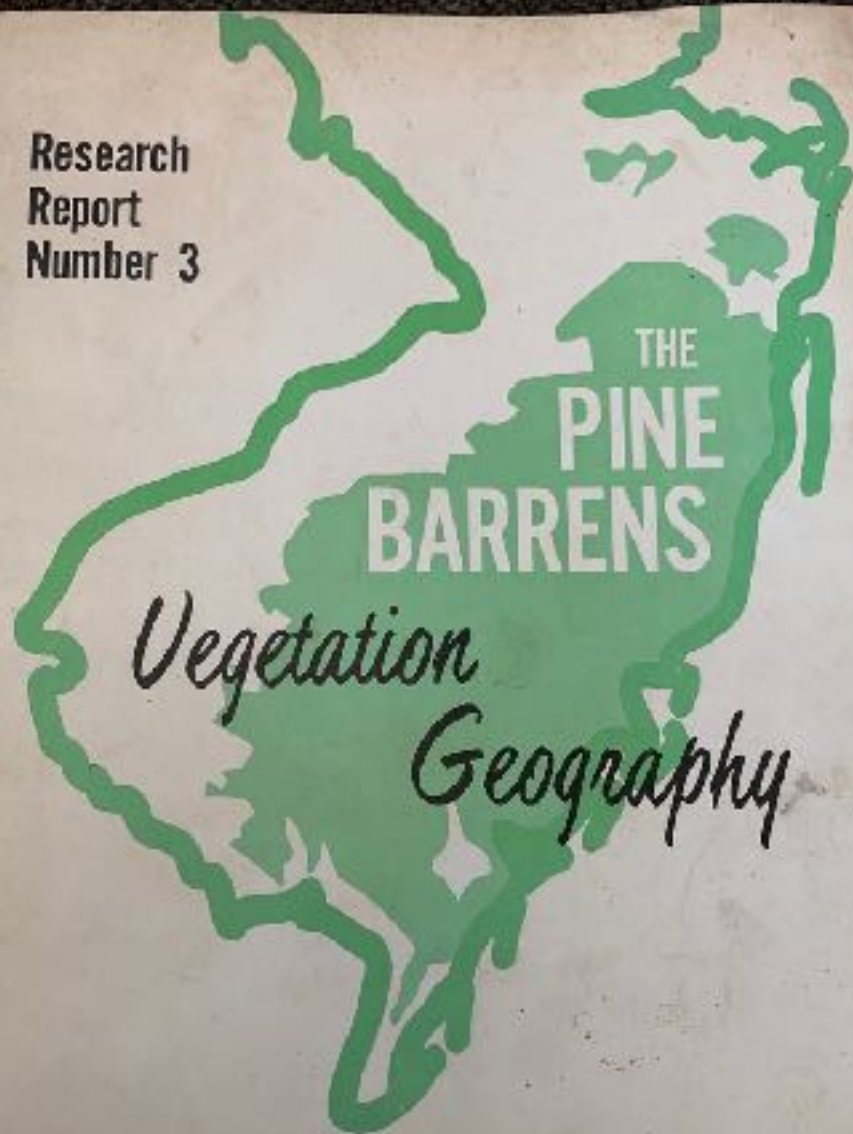




*Leslie Jones Sauer
Land Use, Climate and Sustainability*

Research
Report
Number 3



Jack McCORMICK • Leslie JONES

NEW JERSEY STATE MUSEUM • JANUARY 1973

NJ Pinelands Commission Resolution

Climate change is a new and severe threat to the Pinelands environment

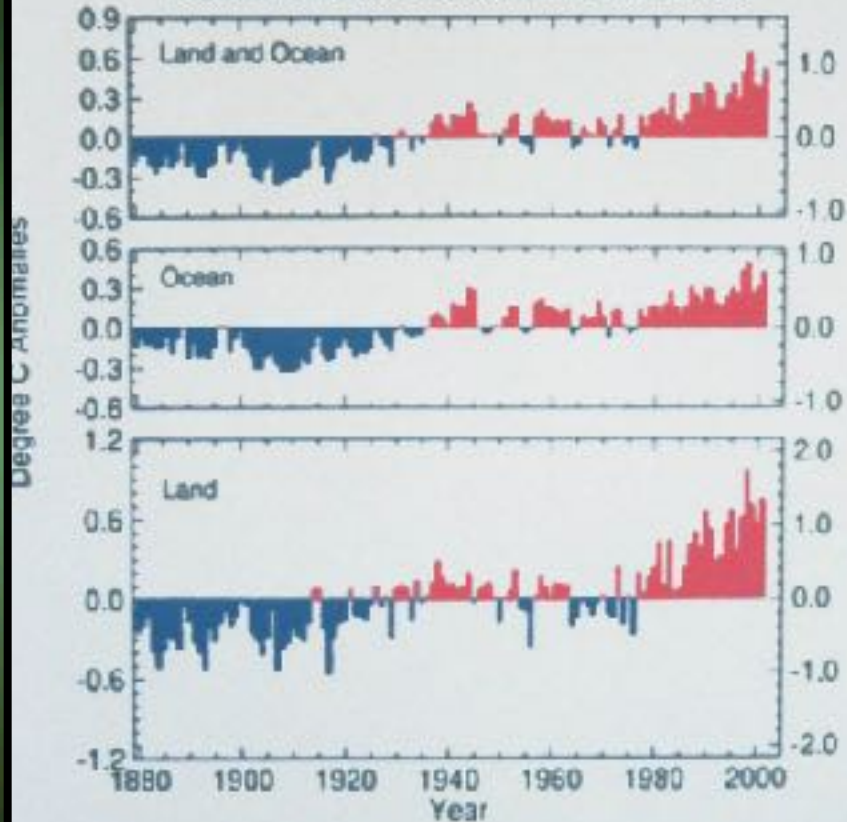
Pinelands should serve as an example as to how to operate in order to mitigate and adapt to challenges of climate change

Need to recommend changes in order to integrate climate change considerations into planning and decision-making

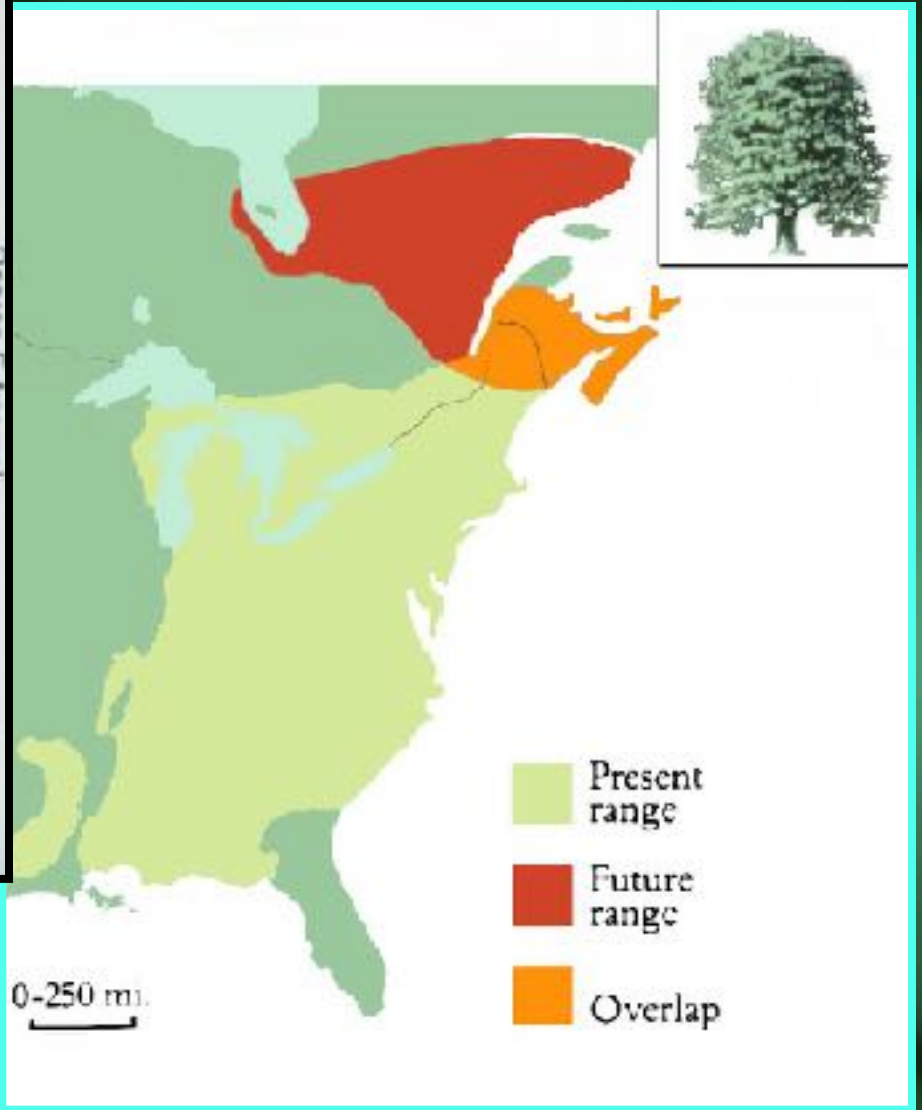
Need to strengthen existing CMP standards to mitigate the effects of climate change to the greatest extent feasible

Jan - Dec Global Surface Mean Temp Anomalies

National Climatic Data Center/NESDIS/NOAA



Global climate change



Shifting plant ranges

The low hanging fruit

- Expand forest preservation
- Better protect existing forest
- Reevaluate forest management
- Restore and release forest
- Establish native grasslands
- Now- because there is no more time left

Better protect existing forest

Reestablish Green Acres protection

Many logging plans now on public land since 2010 (Christie)

Logging often justified as habitat improvement, young forest creation and, climate defense

Protect forest in regulations for development

Remove exemptions for roads, infrastructure etc.

Reject A4843/S3549

Reevaluate forest management

- Forest harvesting accounts for 85% of carbon lost yearly from forests
- If current practices continue half of sequestration potential lost
- Forest Service's 5 priorities do not include biodiversity, carbon storage or climate change
- 'Management' increases erosion, fire risk, invasive and ungulates, and loss of stored carbon including from soil

FS and Foresters approach

- USDA Northern Institute Applied Climate Science
- FS Forest Climate Hubs
- No.Inst. Applied Climate Science
- Rutgers Climate Adaptation Planning for NJ Urban and Natural Forests
- www.forestadaption.org/strategies
- Spp. suitability not sequestration
- All cutting focused; ignores loss of storage

*Richard M. Conley, Pres.
New Jersey Forestry Association
Newsletter 120*

- A well managed forest will go on forever while a forest left to its own devices will die and become useless to anyone.

New Jersey timeline

- Farmland assessment for forests
- Woodland Management Plans on private land
- Green Acres for Recreation and Conservation protects forest on public land for 50 years till Christie
- 2003 federal Healthy Forests Act
- Forest Stewardship Plans
- Forestry plans on public land
- A4843, S3549, S2001, S1954, S1085
- NJ Forest Action Plan

Today's market-Big trees

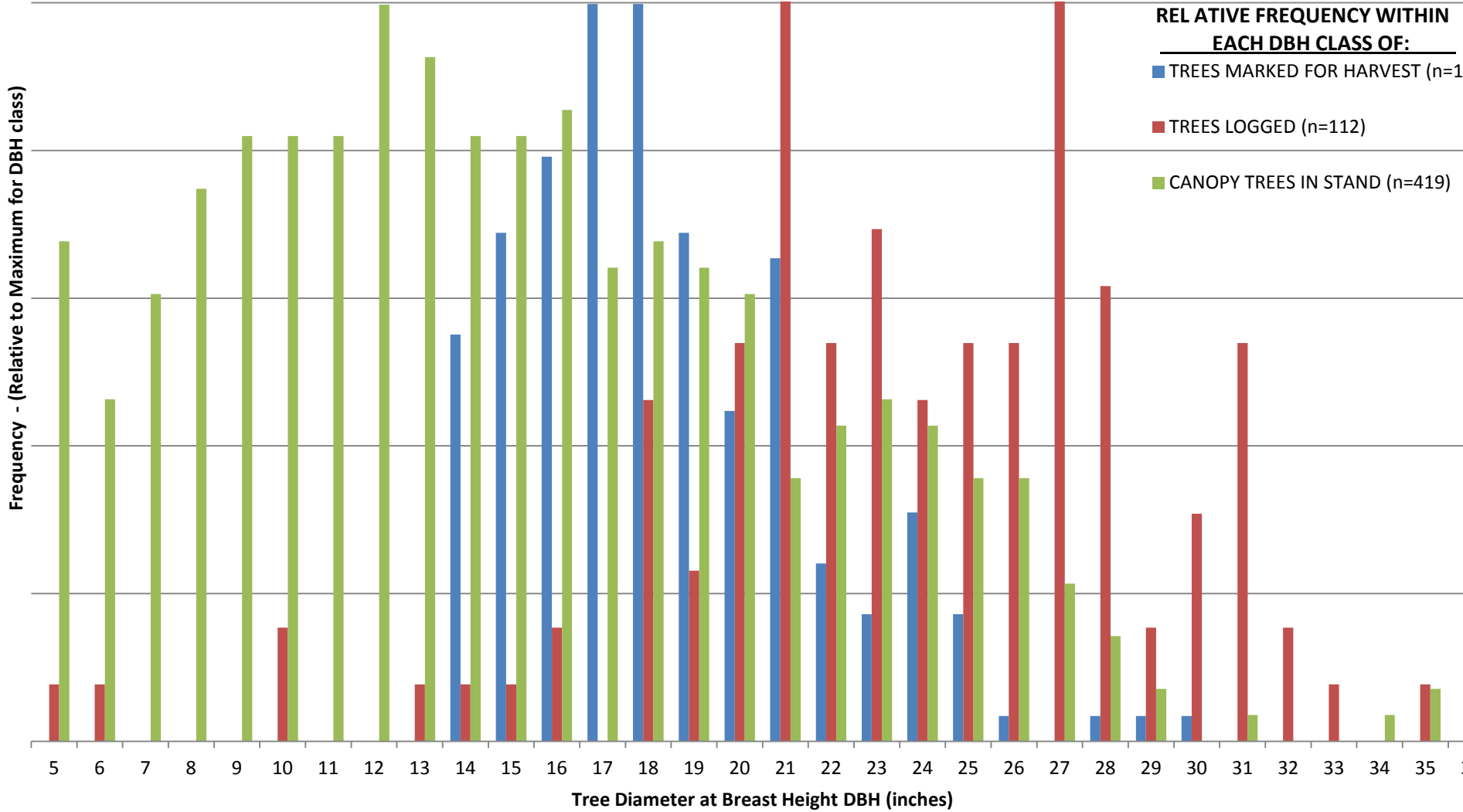


Value of large trees

- One large tree sequesters more carbon in 1 yr than a medium size tree has in a lifetime
- Largest 1% store 50% carbon
- Carbon sequestration increases with tree size for centuries
- Trees continue to store carbon after dying
- Forests need large trees to store carbon
- Only 7% of US forests >100 yrs



Frequency Distribution of Canopy Trees by Diameter Breast Height (DBH) at Weldon Brook WMA



Thinned Forests Issues

- Natural forest often more wildfire resistant
- Prescribed burning more effective than thinning
- Logging often takes the more fire resistant material, leaves slash
- Western fires often exploded in the most heavily thinned areas which were dryer and circulated more air in high winds
- Natural forest more insect resistant
- Harvesting today reduces potential carbon capture by 50%
- Natural forest stores 3x more carbon than sustainably managed forest



Carbon storage in soil

- In addition to carbon stored in trees and other woody spp. and litter, 40% annual carbon storage goes to fungal root networks
- Top 1' accumulates >.5T/ acre
- 25% of spp. on earth are soil organisms
- Forest soil carbon is lost when harvesting and for decades after
- Soil losses twice as great in thinned forests (Homann et al 2011), worse for biomass cuts

Proforestation Moomaw 2019

- Growing forests to reach their ecological potential for carbon storage in wood and soils in the absence of human interference
- New England forests could store 2.3-4.2x carbon as now (Keeton et al 2010), globally twice as much (Erb et al 2018)
- Impact is instantaneous
- Forest carbon reserves worth 10-80x the timber value

Trees and Carbon

- Manage your forests like a carbon portfolio
- Every tree cut is capture and storage lost
- 11.5 BT carbon dioxide emitted yearly from human activity
- 2.5 BT absorbed by oceans, now reaching limit
- 1.7 BT currently lost to deforestation that could be saved
- 3.5 BT taken up by trees, could be doubled with Proforestation
- Proforestation and stopping deforestation could fill the gap NOW

From a climate perspective

- Trees 75-125 yrs. old sequester the most and store carbon for centuries
- There is no such thing as an overmature forest, only saw logs declining in value
- There is no such thing as an overstocked forest, only smaller saw logs
- No salvage logging
- Charred forest often stores more carbon than a thinned forest

Big Obstacles

- Trump ordered 40% increase cutting in Nat'l Forests and on BLM land
- Timber Investment Management Programs
- Hedge fund and foreign ownership
- A forest often perceived to have no monetary value till its cut
- The market wants the big trees on public land
- Young Forest Initiative often misused
- Bioenergy is NOT carbon neutral
- Claims that forestry is about fire management and forest health instead of timber

Bioenergy is not carbon neutral

- Perverse incentives in forestry- federal agencies must assume forest bioenergy carbon neutral
- 75% more CO₂ per BTU than natural gas, 50% more than fuel oil
- Regrowth does not balance cutting even after decades
- Most expensive source of energy
- US global leader pellet export
- Depends on subsidies
- FS making deals with states now

Rutgers Ecoplex Bioenergy Plan

- Goal- to create a strong foundation of information for developing a bio-based renewable energy industry in the state.
- Recommended next steps include establishment of an effective institutional, regulatory and feedstock infrastructure, as well as comprehensive strategic and tactical industry development plans.
- Forest is not 'feedstock'.

Talking About Young Forests

A Communication Handbook



Young Forest Initiative

- Valid concern- 22/38 spp in decline
- Ignores other forest values
- Poor site selection in NJ
- Interior forest-28/90 spp in decline
- Extensive opportunities to restore degraded young forest
- Requires maintenance, no revenue
- Rotational clear/seed tree cuts disrupt non-woody plant spp
- USDA/FS/NRCS incentives

Proforest Implementation

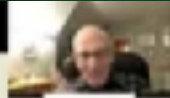
- Restrict forest ownership by large, foreign and investor ownership as 9 states do re: corporate farming
- End carbon neutrality designations for forestry biomass energy
- Reroute subsidies and incentives to protection and monitoring
- Include forest carbon in 'qualified compliance' measures
- Establish fair carbon markets to include forest offsets

NJ Forest Stewardship Plans

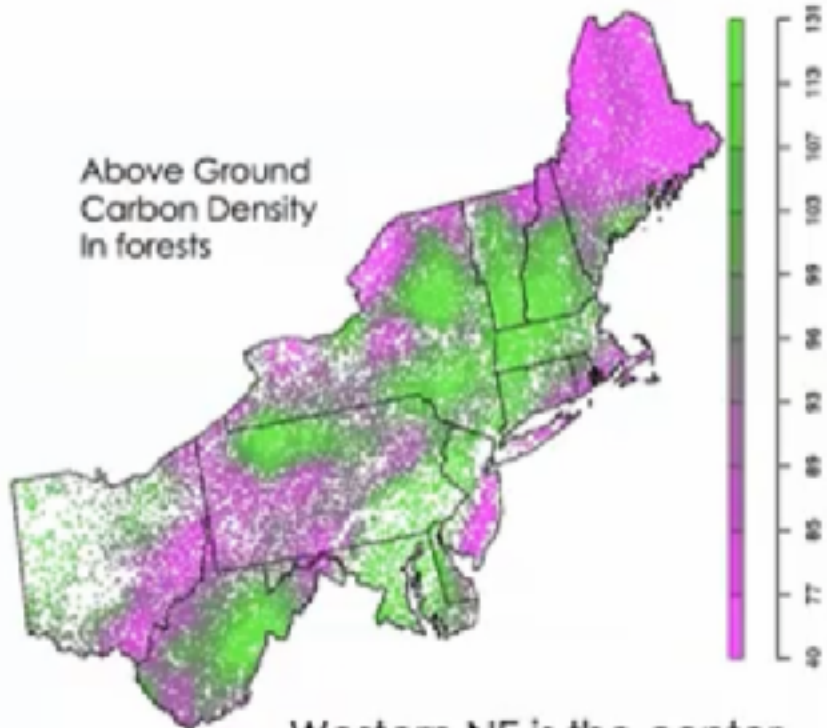
- Opportunity for proforestation on private land
- Opportunity for restoration focused management
- Get another forester if they say you must cut forest to comply
- Right to burn
- Need to confront deer problem
- Not adequate for public lands management

Public lands proforestation

- Municipal, county and state lands
- Quasi public lands
- Watershed lands
- Requires grassroots pressure
- Confront perverse incentives- USDA 'stewardship/habitat/wildlife' funding
- No commercial forest products from public land acquired with Green Acres
- New funding opportunities
- Forest Carbon Reserves



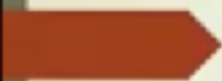
COLE Map
Total Aboveground Carbon (metric tons/hectare)



Above Ground
Carbon Density
In forests

Western NE is the center
Of high carbon dense forests

US Forest Service



STANDING
TREES
VERMONT

Forest Carbon Reserves

- Do not foreclose by logging public land
- Natural vs. Working Forests
- Better source of natural forest income
- Assures Green Acres compliance
- Require scientific professionals and practitioners in management
- Management of rare species allowed
- Management of deer and invasives allowed
- Monitoring required

NJ Forest Action Plan

- Climate imperative/forest protection
- FIA inadequate for site/stand evaluation
- Inaccuracies about thinning/carbon
- Young forests do not sequester and store more carbon than old ones
- Density management not critical to maintaining carbon pools/health
- Forest products fail to support carbon sequestration/storage
- Should be more proforestation focused
- Should support carbon credits for forests

A 4843/S3549

Requires FSP's on all Green Acres Program funded recreation and natural conservation forested land over 25 acres

Unfunded mandate, violates home rule

Unnecessary increase in state control over municipal land

Management costs DEP/municipalities/NGOs

Increases GHG emissions, depletes stored carbon and reduces sequestration

FSPs do not address recreation or natural conservation, only logging.

Many forests well managed by local scientists

Purpose of bill is to encourage logging

A 4844/S3550

Eliminates all municipal review,
control and regulation over forests

Violates home rule

Municipalities already prohibited
from impending or conflicting with
the implementation of an FSP

Retroactively weakens the
environmental protections of other
ordinances, like tree protection

Prohibits upgrading CMPs

A 4845/S3548

Requires annual burning of 4% of NJ forest with no scientific basis and 50,000 acres across Pinelands and 10,000 acres "somewhere else"

No science, just political decisions

Not needed, FS does good job now

Another unfunded mandate

Fosters logging

A 4846/S4947

Significantly weakens and circumvents
role of Pinelands Commission

Prohibits implementation of climate
resolution

Working group logging focused

No safeguards against conflicts of
interest

Gives control over public land to
private groups with financial incentives
to log

Higher Standards on Public Land

- FSPs not adequate on public land
- Public participation
- Protect forest on native soil
- Protect large trees, older forests
- Plant and animal surveys RTE FQA
- No commercial forest products
- Cut and drop, girdle
- Manage deer and invasive spp
- Up-to-date guidelines
- Restoration practitioners, scientists

Decade of Restoration 2021-30

- Forest carbon reserves
- With fair carbon markets that include forest offsets landowners could be rewarded for forest protection
- Markets could protect forest and foster restoration
- Protect intact forest in NJ now, Natural Heritage, State parks and forests, Wildlife management, municipal parks and land trusts

Young forest patches- cut/girdle/drop









A Hot Topic- Fire

- Charred forests store more carbon than thinned forests
- Prescribed burning releases far less carbon over time than wildfire
- Could reduce CO₂ loss by 60% in west (Wiedinmyer & Hurteau 2010)
- Prescribed burning best wildfire defense
- Fire supports understory regeneration
- Residents usually biggest objectors



Fire as a natural process







Thinning before burning
Strategic fire breaks



Rewilding vs. Planting

- Natural regeneration far cheaper than planting- 100s B
- High failure rate planting
- Diverts conservation resources
- Poor site and spp selection
- Carbon capture lower with fast growing trees
- Wildlife prefer recovered forests
- 58m acres Russia
- England target 10 to 25% forest cover