# Management Approaches for Rare Ecological Communities of the Pinelands:

# Preserving the "Open-Canopy Vegetation Types"

**by Andrew G. Windisch**
**Office of Natural Lands Management**
**NJDEP**

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## "Open canopy vegetation types" are fire-dependent ecological communities of the New Jersey Pinelands

- They include woodlands, barrens and savannas which normally have an open to sparse tree canopy, as well as palustrine shrublands, grasslands and herblands which are treeless.

- They are characteristic vegetation types in the fire-prone central "core" of the Pinelands, where large canopy-opening wildfires once occurred at 5-30 yr intervals. Most types are in decline from a modern reduction in fire and disturbance regimes.

- They provide critical habitats for many rare or declining species of plants, moths & butterflies, snakes and birds which rely on open sunny conditions.

- Most open canopy types are ranked as globally rare or state rare ecological communities by NatureServe (The Nature Conservancy) and New Jersey Natural Heritage Program.

**Examples of open canopy vegetation types of the Pinelands include:**

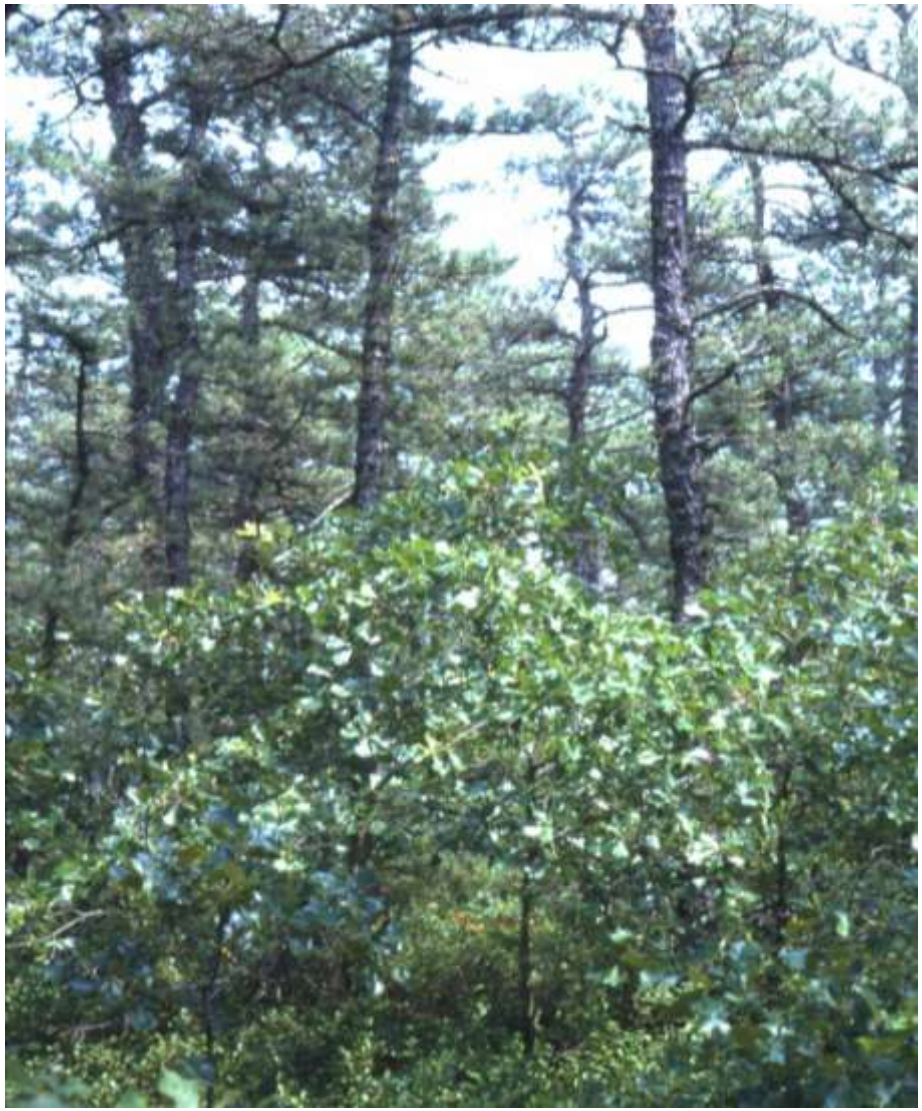
UPLANDS

- pitch pine-shrub oak barrens & woodlands (several types)
- dwarf pine plains
- pine-sedge uplands
- successional uplands

WETLANDS

- pitch pine lowlands (several types)
- hydric pine plains
- palustrine shrublands (e.g. leatherleaf bogs)
- palustrine grasslands
- riverside savannas
- intermittent ponds
- successional wetlands

# pitch pine-shrub oak barrens



# dwarf pine plains

Broom crowberry

# Pitch pine lowlands

## pitch pine-mixed heath lowlands

## pitch pine-sand myrtle lowlands

## pitch pine-reedgrass savanna

## pitch pine-leatherleaf lowland

Treeless wetlands (seasonally flooded or saturated by groundwater):

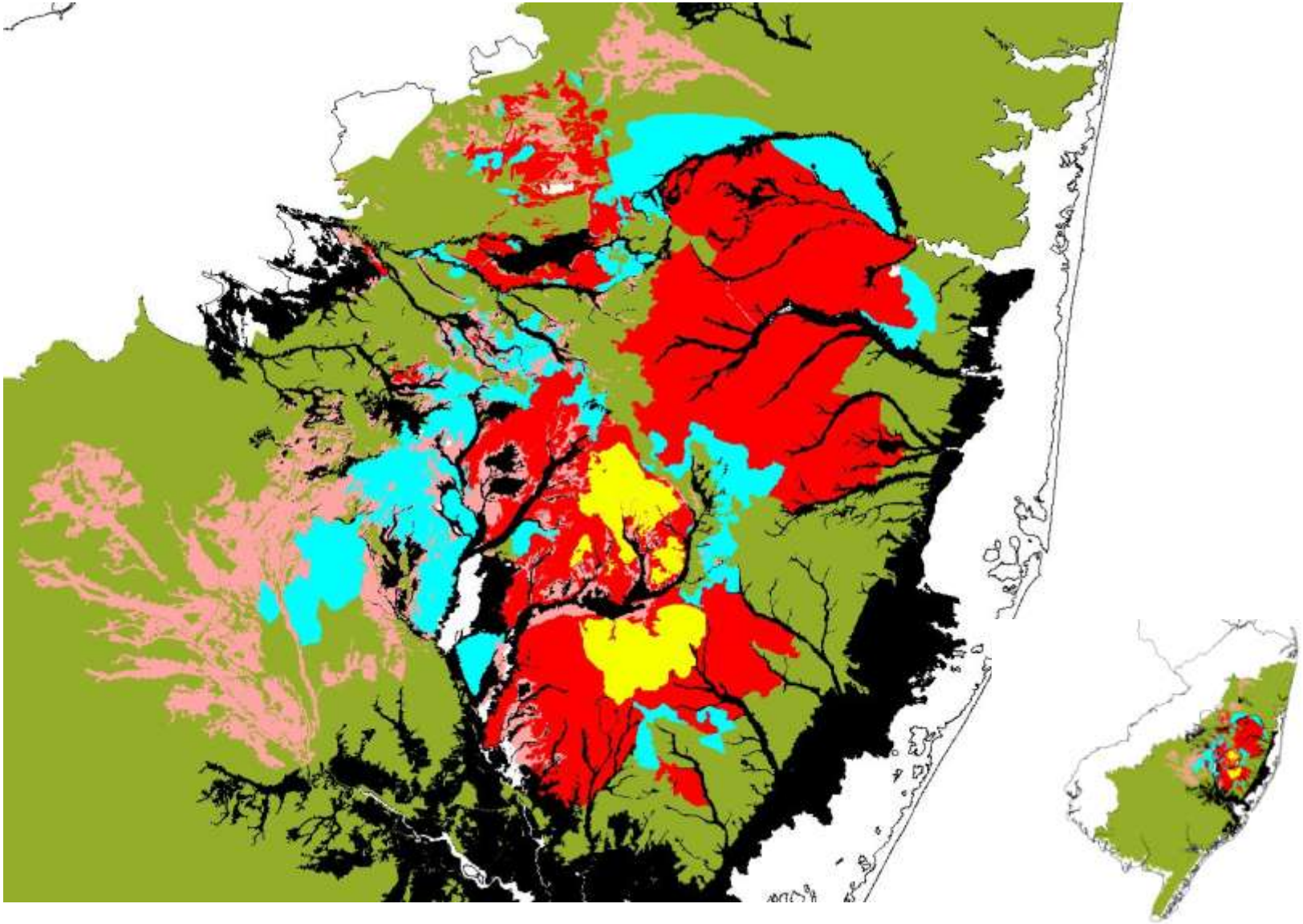
riverside savanna

palustrine grassland

intermittent pond

palustrine shrubland (e.g. leatherleaf bog)

# Most open canopy vegetation types are concentrated in the fire-prone “core” of the Pinelands



**Most open canopy vegetation types are created or maintained by:**

1) frequent wildfire regimes (ranging from 5-30 year intervals between crowning or scorching fires)

2) a severe wildfire event (e.g. growing season turf fire, especially in wetlands)

3) man-made disturbance which mimics frequent or severe wildfire

4) seasonal groundwater flooding or seepage in some wetland types with an open canopy

**Current management regimes in the Pinelands which degrade open canopy vegetation types and reduce rare species diversity include:**

- Prolonged fire exclusion and increased fire return intervals, causing: a) canopy closure and loss of open habitat species, b) increased fuel loads and unnaturally severe fires, or c) eventual succession to more common, less diverse forest types.

- Lack of canopy disturbance or thinning (such as by tree cutting) in long-unburned, closed-canopy stands.

- Dense planting or regeneration of pine during silviculture, with no follow-up thinning or burning of young pines to prevent canopy closure.

- Frequent low intensity prescribed burning applied under a closed canopy stand of pine-shrub oak types. →

**Ecological impacts of frequent prescribed burning in pine-shrub oak:**

1. Frequent prescribed burning (< 5-6 yr intervals) does not allow enough time for several rare moth and butterfly species to recover between fires, causing local extirpation of rare species populations.

   Impacts are greater in degraded pine-shrub oak habitats with a closing canopy, where some insects may require at least 10? yrs between prescribed fires to persist (more research needed).

**Ecological impacts of frequent prescribed burning in pine-shrub oak:**

2. Frequent prescribed burning under a closed canopy greatly reduces shrub oak cover, flowering and acorn production, and reduces cover of some herbs, degrading pine-shrub oak communities and reducing available host plants and habitats for rare species and wildlife.

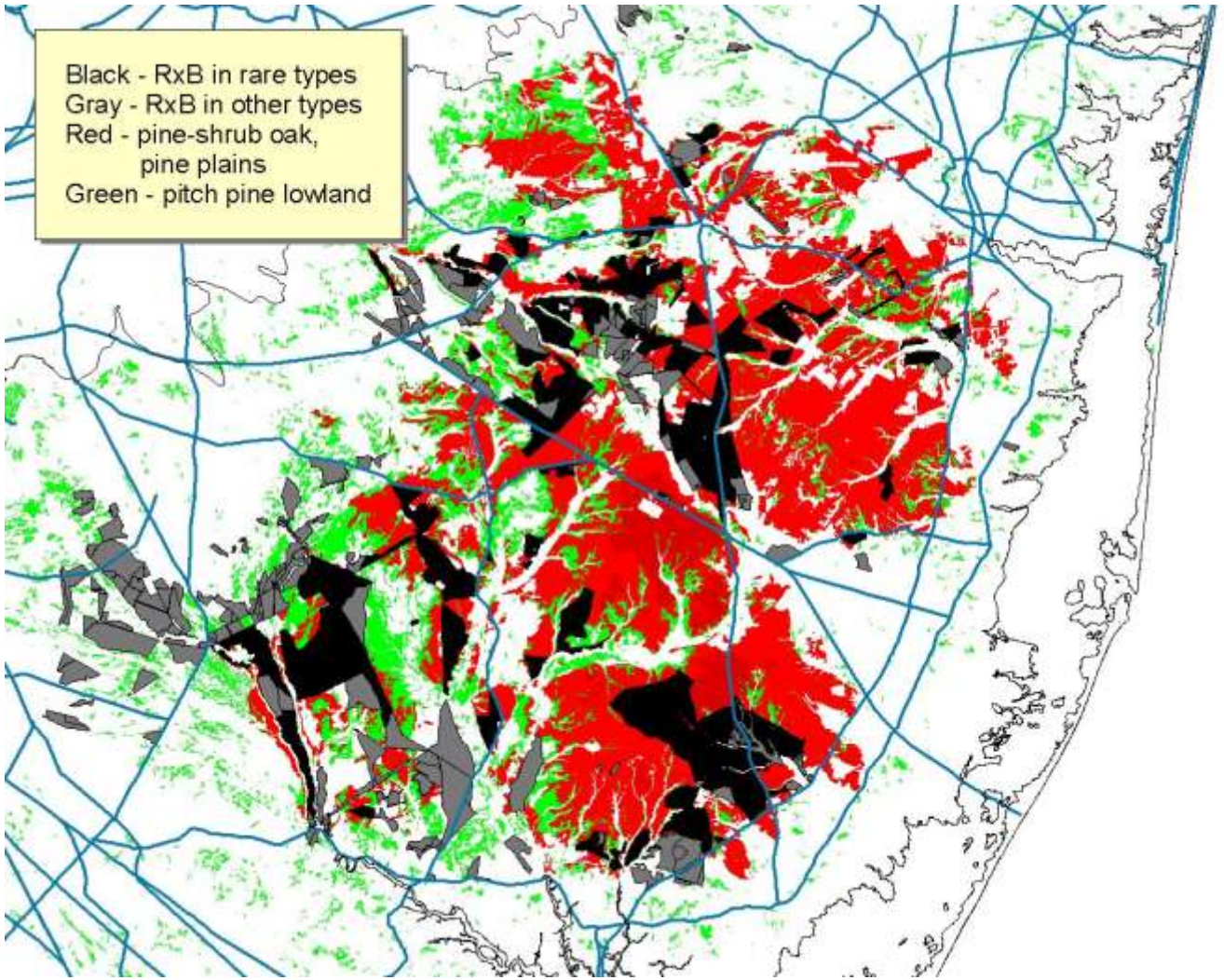
**Ecological impacts of frequent prescribed burning in pine-shrub oak:**

3. Frequent prescribed burning with backfires under a closed canopy (left) precludes more intense scorching and crowning "ecological prescribed burns" (right). These more intense burns would restore an open canopy and rare species habitat.

**Ecological impacts of frequent prescribed burning in pine-shrub oak:**

4. A regime of frequent prescribed burning over decades will eventually eliminate shrub oaks and some herbs, causing a type conversion to more common, less diverse pine-heath uplands, and a long term loss of critical habitats and rare ecological communities

5. Prescribed burning fuelbreaks alter natural fire spread patterns and fire regimes far beyond the burn units in the Pinelands core.



**Management approaches to preserve "open canopy vegetation types"**

1) Where prescribed burning is done in pine-shrub oak stands with a closed canopy (left), integrate "ecological forestry" to thin the canopy down to about 25-50% cover (right). Opening the canopy mimics an intense wildfire, reducing the combined impact of prescribed burning and canopy shading on shrub oaks and rare species, and preventing a long term type conversion to less diverse pine-heath uplands.

**Management approaches to preserve "open canopy vegetation types"**

2) In the long unburned pine-shrub oak and pitch pine lowland stands, apply "ecological forestry" to thin the canopy down to about 25-50% cover. This restores open-canopy structures and critical habitats, and reduces the hazard of crown fires and extreme wildfire behavior.

   Thinned stands can be maintained with sporadic scorching surface fires (right) or backfires, to control pine, shrub and surface fuels.

**Management approaches to preserve "open canopy vegetation types"**

3) Where adequately contained, prescribed "ecological burning" with crowning and scorching fires can be used in pine-shrub oak and pitch pine lowland stands unburned for moderate periods. Like wildfires, ecological burns reduce canopy and surface fuel hazards, maintaining open-canopy structures and critical habitats for rare species.

**Management approaches to preserve "open canopy vegetation types"**

4) In closed older stands of dwarf pine plains lacking broom crowberry, intense ecological burning can be applied (where adequately contained), to reduce fuel hazards and restore open-canopy structures and critical habitats…..

…but once restored, open-canopy pine plains can be maintained by milder scorching surface fires at about 5-7 yr intervals, as historically documented.

Frequent mild surface fires leave unburned pockets that enhance survival of fire sensitive broom crowberry, along with other early successional species.

5) In long unburned pine plains with fire sensitive broom crowberry, apply ecological forestry first to restore open habitats, followed by milder ecological burning regimes to maintain rare plants and open habitats or buffers. (Same approach may apply to other fire sensitive species such as Pickerings morning glory, American chaffseed, etc.)

**Management approaches to preserve "open canopy vegetation types"**

6) Create scattered patches of severe disturbance, such as by bulldozer scraping or drum chopping, to create early successional habitats for rare species.

Apply in scattered sites up to several acres in size, or in linear swaths along roads or wildland-urban interface.

Maintain with mowing, prescribed burning or redisturbance.

**Management approaches to preserve "open canopy vegetation types"**

7) <u>If dense young pine stands are created in pine-shrub oak during silvicultural, thin or prescribe burn early in the rotation to reopen the pine canopy.</u> If done before the pine canopy closes and shades out the shrub oak stratum, this will prevent a long term type conversion to more common, less diverse forest types like pine-heath upland.


**Management approaches to preserve "open canopy vegetation types"**

8) Allow natural regeneration to occur in successional habitats created by severe wildfire or disturbance. This will prolong the duration of open successional stages which provide rare species habitat.

## Conservation & Research Needs (potential forum topics):

1. Identify and start pilot projects on public lands where ecological forestry and ecological burning can be used to restore open canopy vegetation types in decline (such as long unburned sites, prescribed burning units and silvicultural stands with closing canopies)
2. Integrate hazard reduction projects and ecological management
   (e.g. in progress: Berkeley Triangle, Bass River IFMZ, Hay Road, East Plains Natural Area, East & West Plains Firesheds, Batsto Natural Area)
3. Monitor the effects of ecological forestry and ecological burning projects on biodiversity and fuel conditions, to fine tune best management practices.
4. Conduct basic research on life history attributes of rare species and characteristic species, to fine tune best management practices.