



PennState



Burning *mis*Matches in Firescapes of the mid-Atlantic

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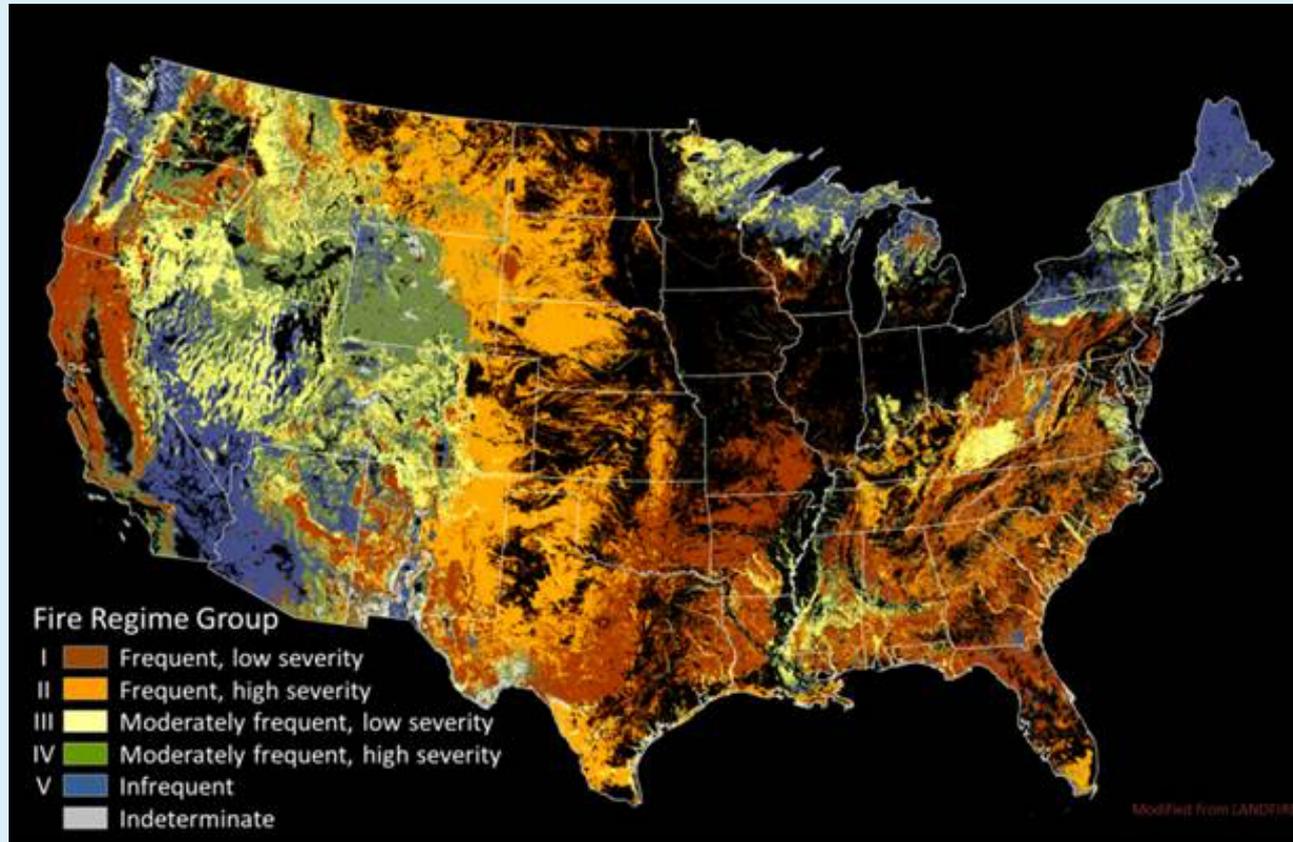
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Fire Learning Network, Garrett College, McHenry, Maryland
September 11, 2019

Pyrogeography

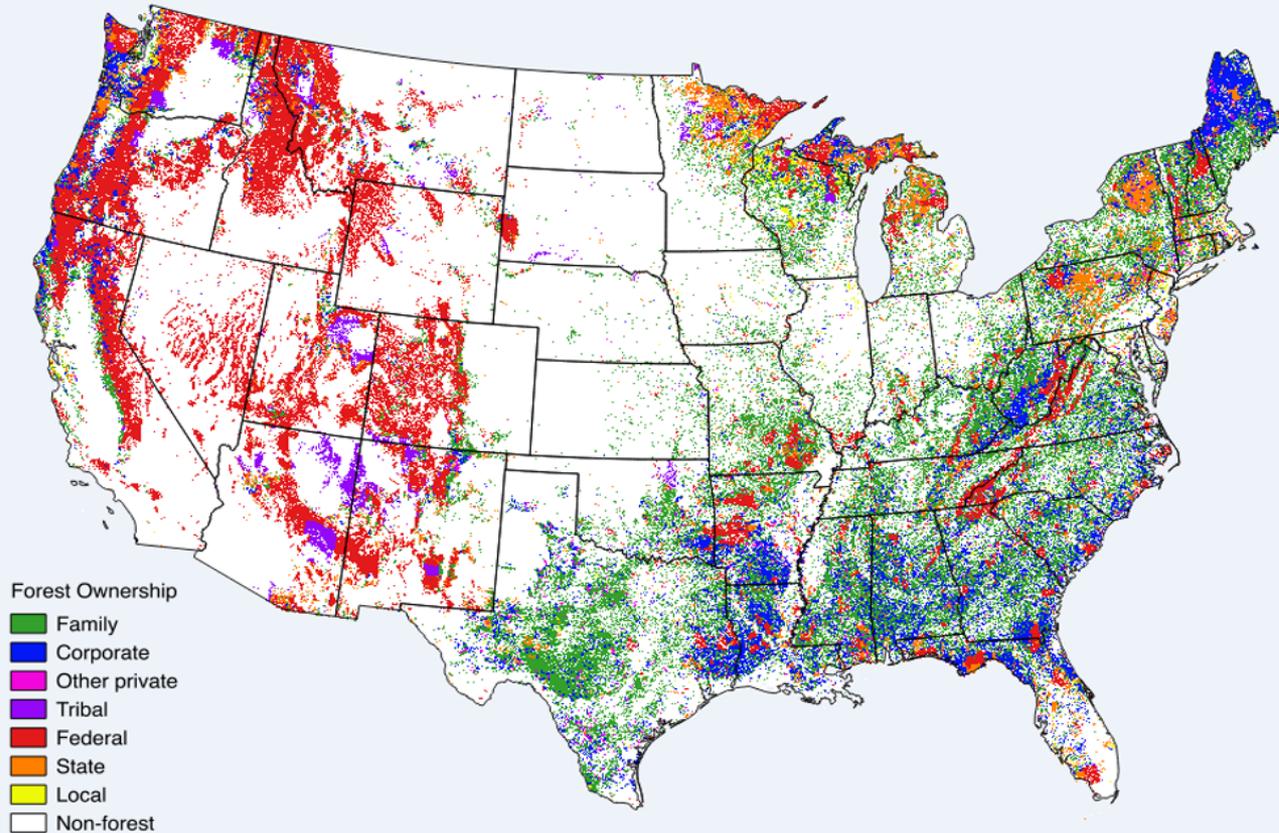


Social: WUI



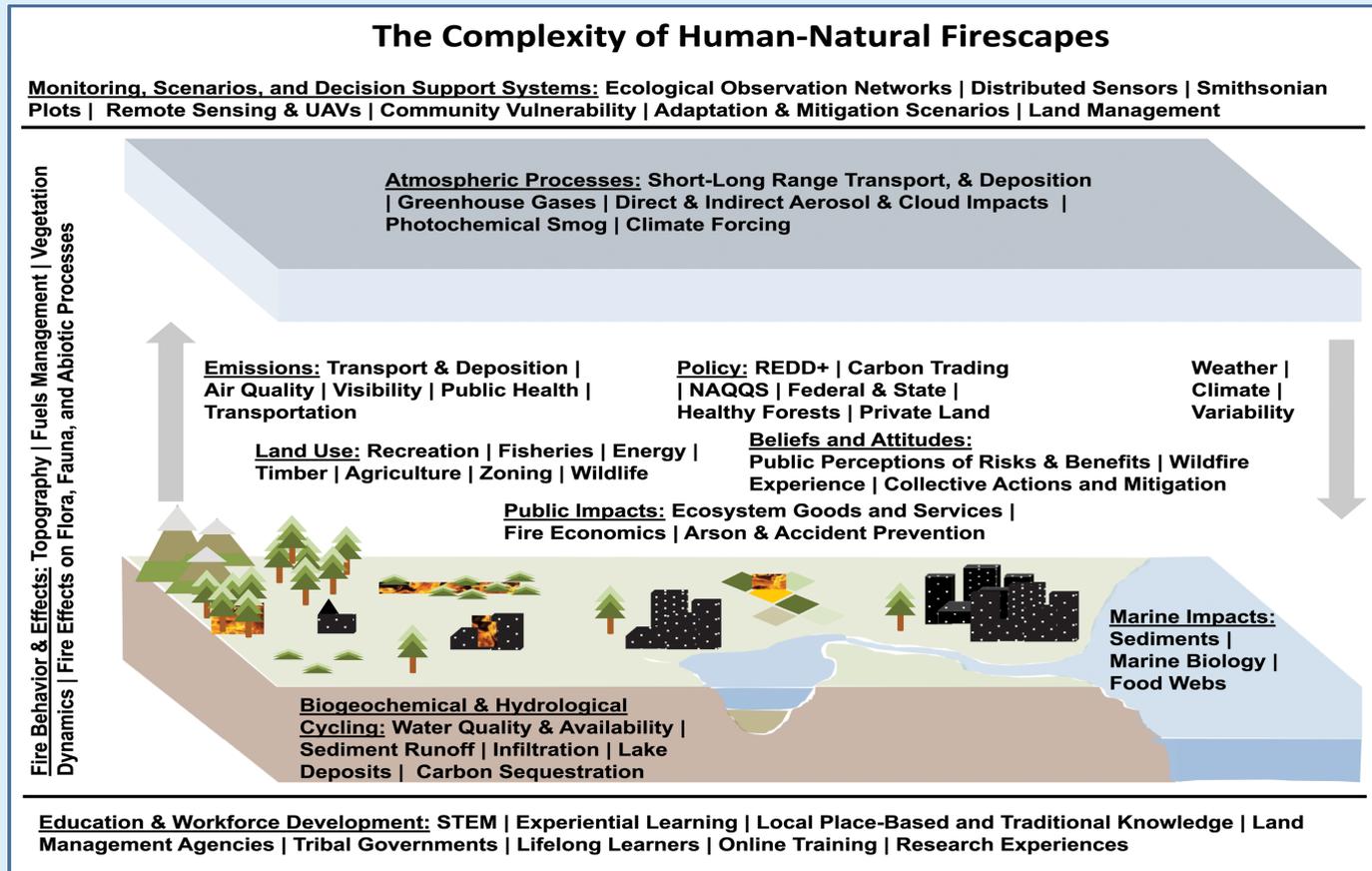
Radeloff et al. PNAS 2018;115:13:3314-3319

Social: Ownership



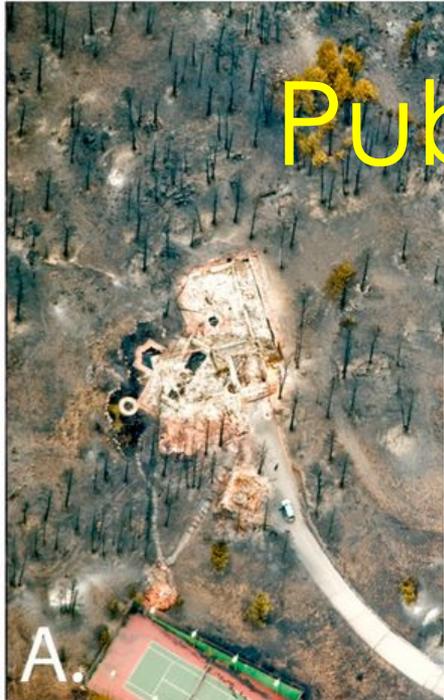
<https://www.fs.fed.us/sites/default/files/forest-ownership-map.png>

Firescape as coupled system

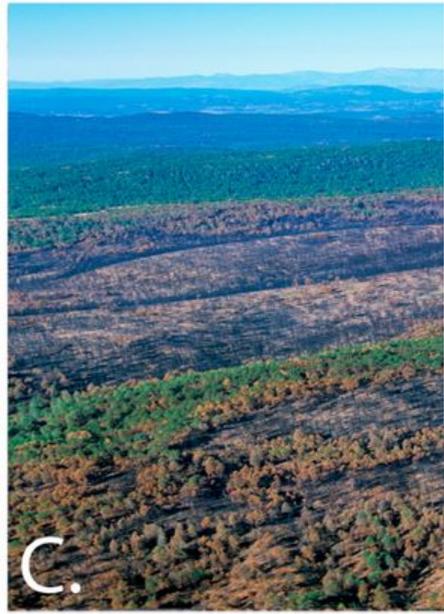
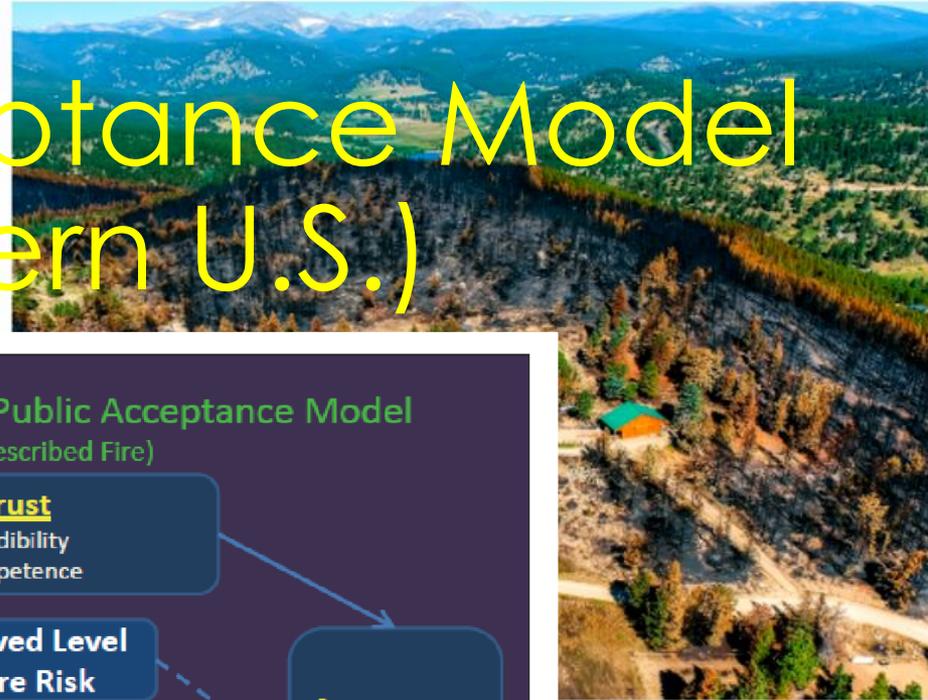


Smith et al. Bioscience 2016

Public Acceptance Model (Western U.S.)



A.



C.

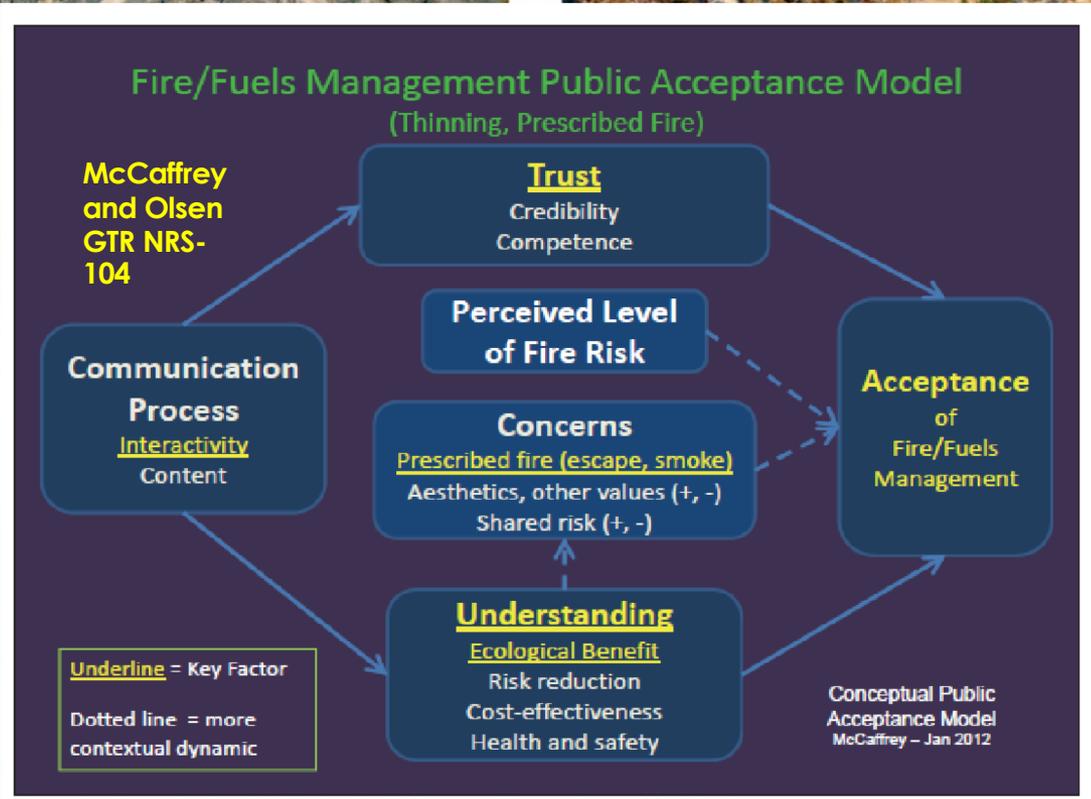
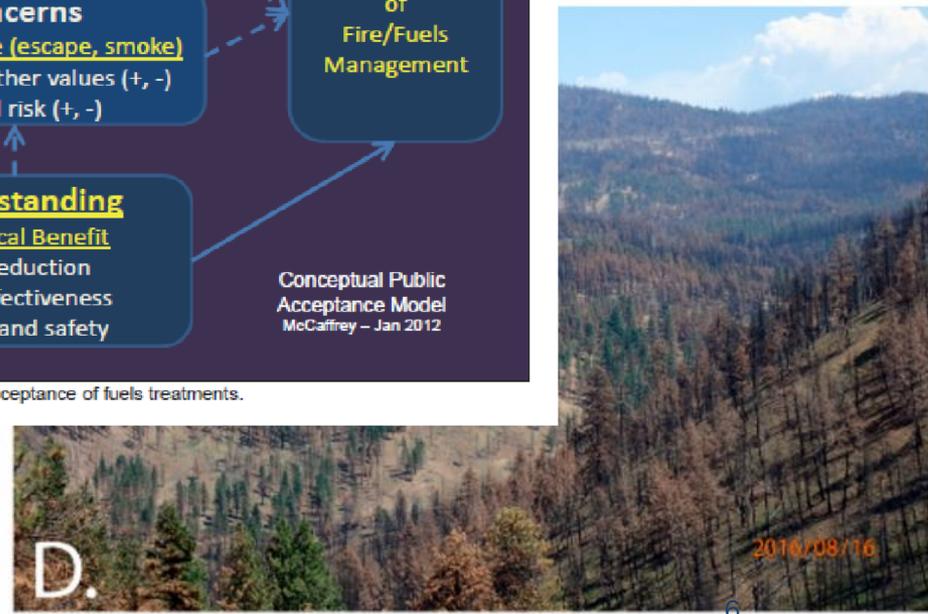


Figure 1.— Conceptual model of factors that influence public acceptance of fuels treatments.

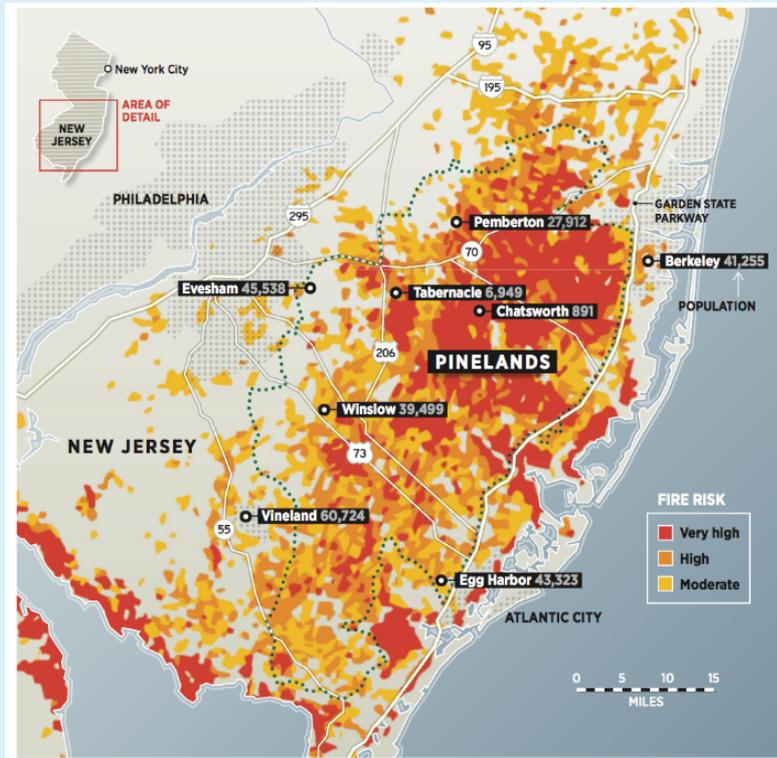


D.

2016/08/16

Will America's Worst Wildfire Disaster Happen in New Jersey?

Fires in the West dominate headlines, but the single most destructive blaze in U.S. history could occur in the Northeast



<https://www.rollingstone.com/politics/politics-news/will-americas-worst-wildfire-disaster-happen-in-new-jersey-34156/>

New law means expanded use of prescribed burns

MICHELLE BRUNETTI POST Staff Writer Aug 29, 2018



Robert Williams, of Pine Creek Forestry, a certified forester with 40 years of experience, watches the progression of the fire during the controlled burn in the forest of Stockton University. Wednesday November 23, 2016. (Viviana Pernot / Staff Photographer)

VIVIANA PERNOT / STAFF PHOTOGRAPHER

https://www.pressofatlanticcity.com/news/breaking/new-law-means-expanded-use-of-prescribed-burns/article_955bc917-273b-5ca6-9f5e-4fb9a6ccc9fc.html

Pennsylvania Passes Prescribed Burning Act

Many ecological communities in Pennsylvania (including native grasslands, oak-hickory forests, and serpentine barrens) depend on periodic fires to maintain their plant community composition and structure. In an even wider range of habitats, fire can be a tool to help combat invasion by non-native plant species. But conducting prescribed burns on private land has been a challenge in the state because of liability concerns. While other regions of the country have embraced the modern use of prescribed fire in managing habitats, Pennsylvania has long been stuck in the Smokey the Bear fire suppression mentality, with only a few organizations conducting regular prescribed burns on private land.



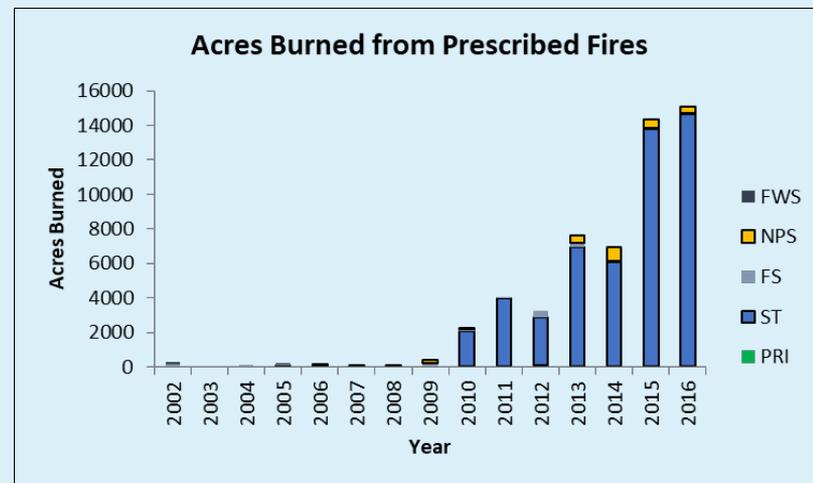
A prescribed burn in progress on a conservation property in New Jersey. Photo (c) 2009 Matthew Sarver

All that changed on July 14th 2009, when Pennsylvania Governor Ed Rendell signed **House Bill 262**, establishing the Prescribed Burning Practices Act. Introduced by Rep. Gary Haluska, the new law authorizes the state Department of Conservation and Natural Resources to establish standards for the conduct of prescribed burns in the state. The state will begin regulating burning practices by certifying burn managers and requiring state approval for burn plans. In exchange, the law limits the criminal and civil liability of landowners and burn managers, so long as the regulatory process is followed:

No owner of property who contracts with or authorizes a prescribed burn manager to conduct or permit a prescribed burn on the property pursuant to the requirements of this act shall be subject to civil or criminal penalty for damage or injury caused by the fire or resulting smoke, unless negligence is proven.

— PA House Bill 262

<http://matthewsarver.com/2009/07/pennsylvania-passes-prescribed-burning-act/>



Why the mid-Atlantic

- Emergent and experienced fire histories
- Range of low to high fire hazard
- Finely intermingled ownerships and institutions
- Expansive “WUI”
- Multiple burning objectives

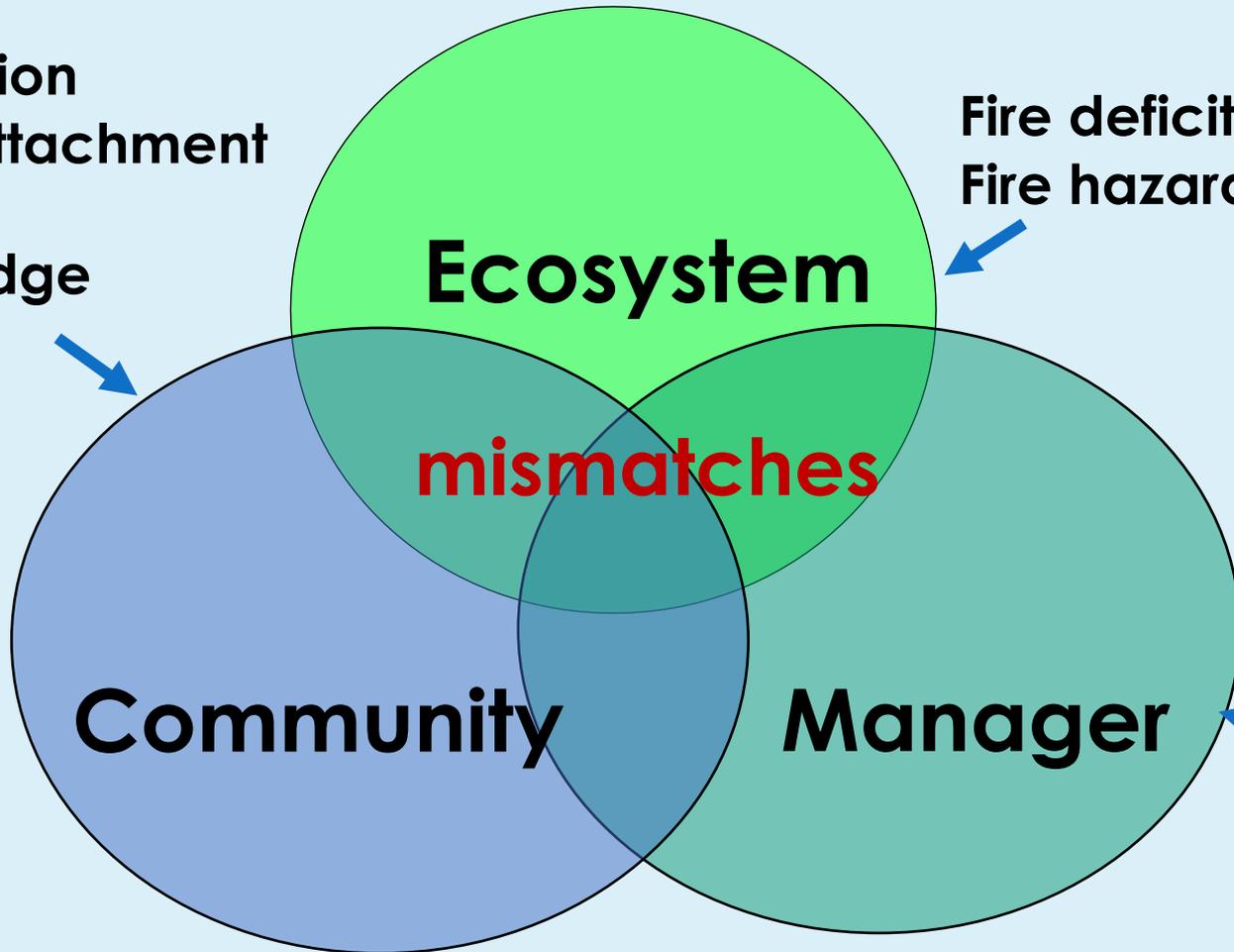


Understudied!

Great example of firescape challenges

Lessons can be generalized in other contexts, globally

Recreation
Place attachment
Trust
Knowledge
Values

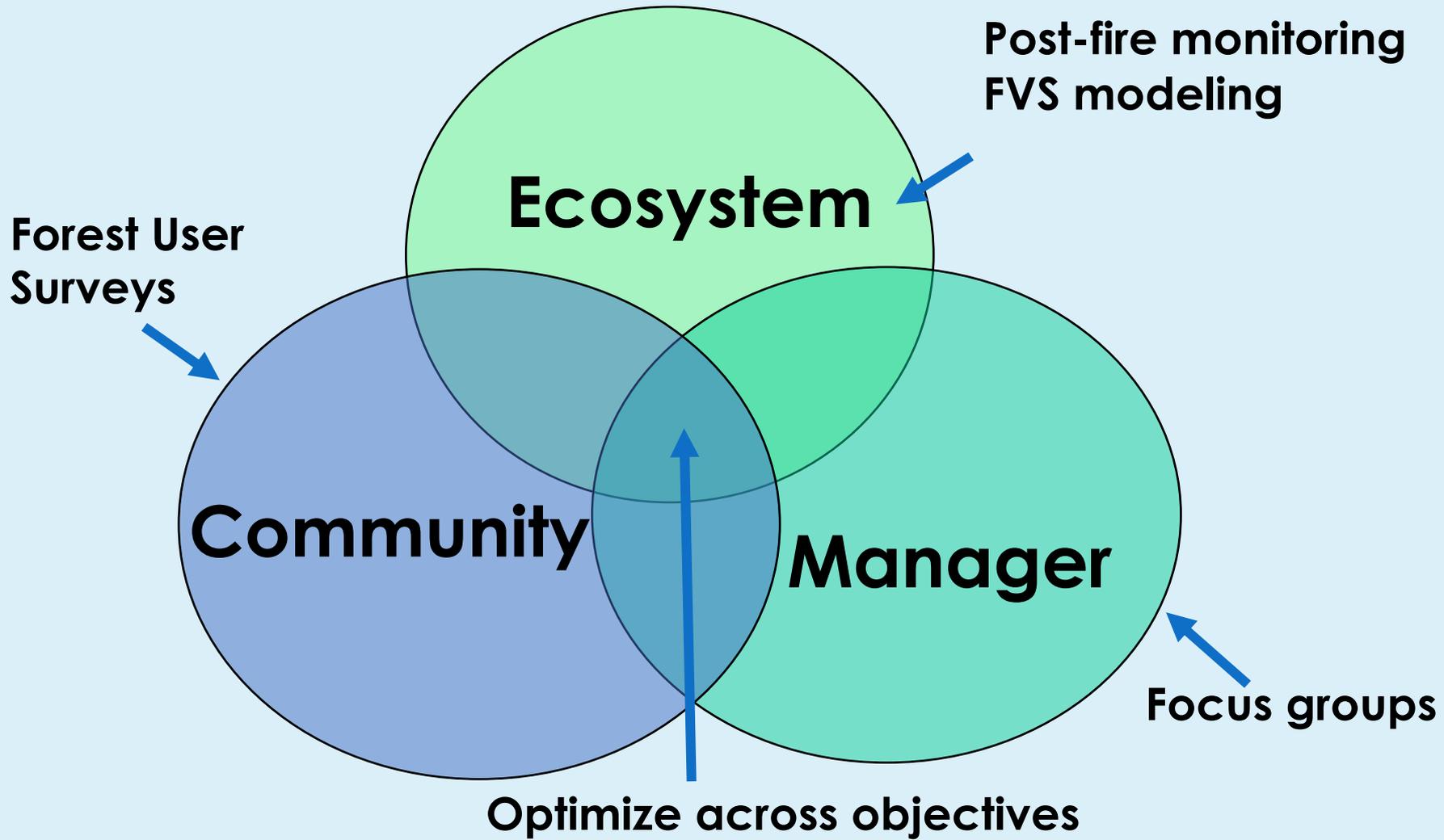


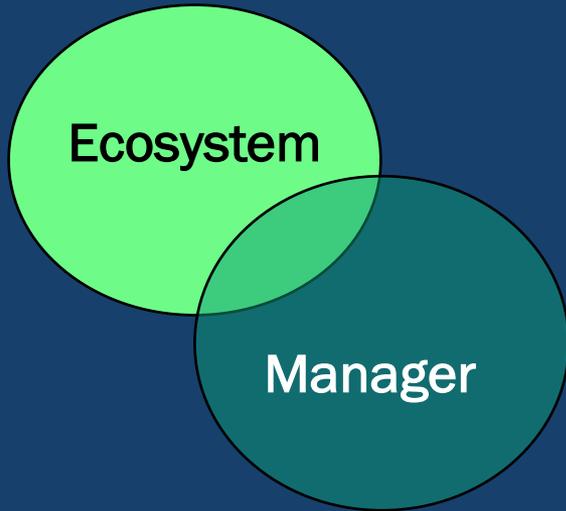
Fire deficit
Fire hazard

Community

Manager

Capacity
Flexibility



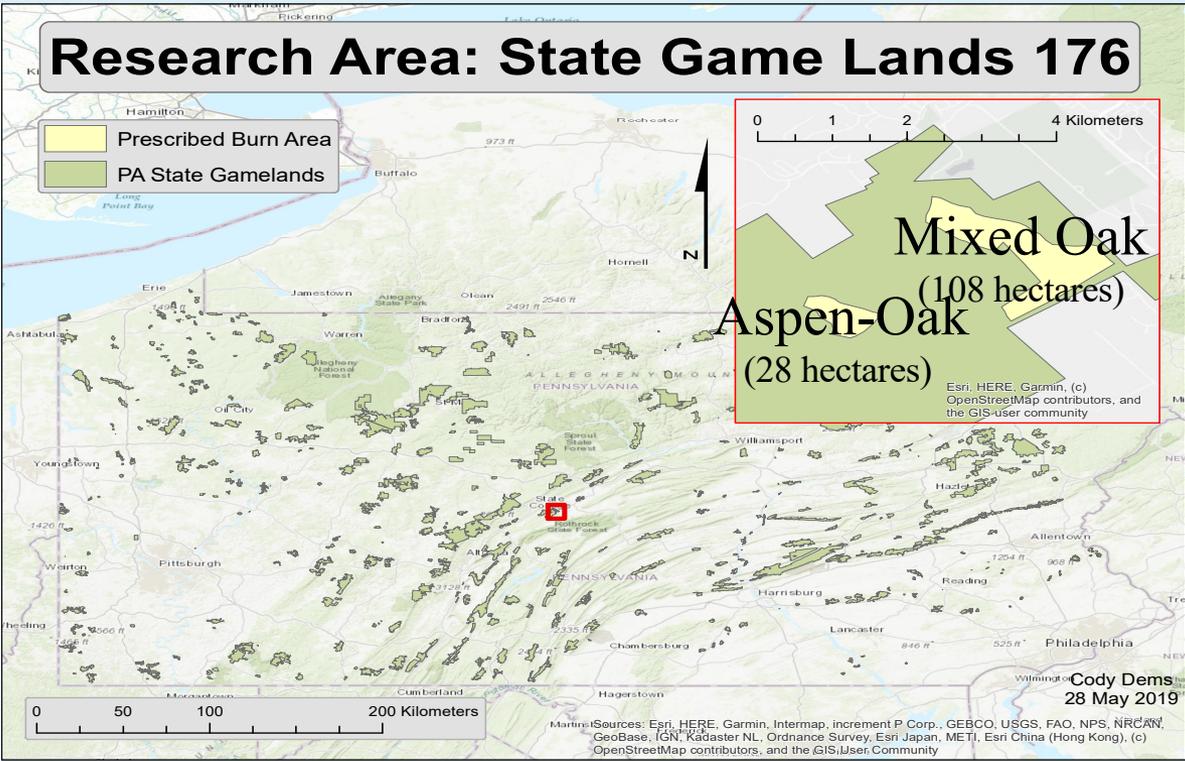


MISMATCH #1

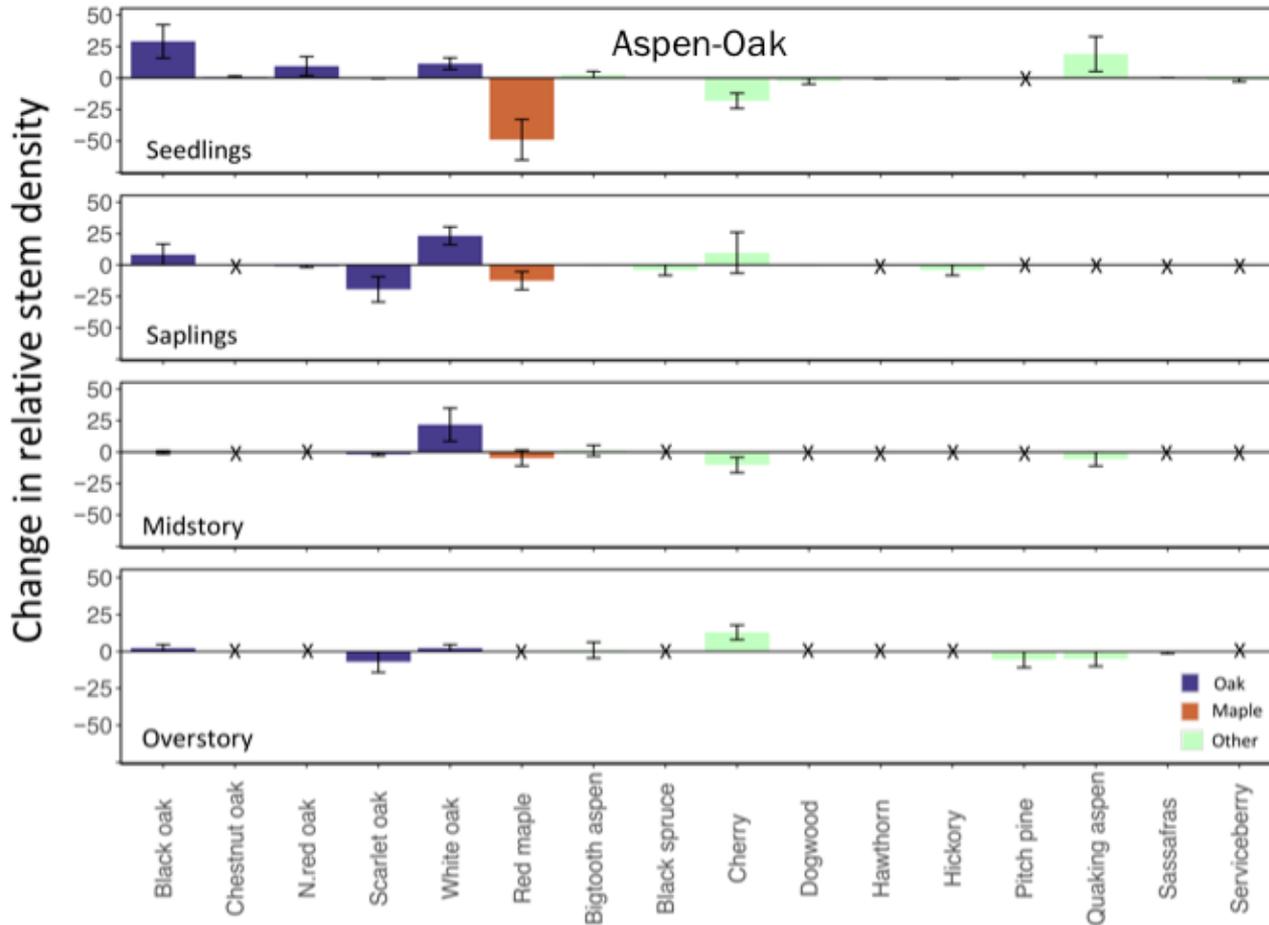
Goldilocks Dilemma

Getting the “right” fire frequency to promote the “right” ecological benefits (oaks/pines) may not match agency capacity

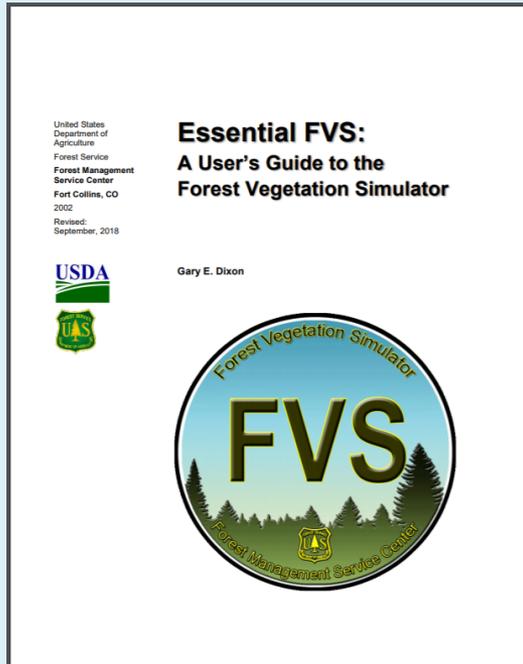
How does Rx fire influence the structure and composition of mixed oak forests in PA?



Single-burn: maple ↓, oak ↑



How does fire frequency influence the composition and structure of mixed-oak and pine forests in the mid-Atlantic U.S. over longer time periods (60 yrs)?



Empirical data from state and federal agencies

- PA DCNR Bureau of Forestry Continuous Forest Inventory (CFI)
- Pre- and post-burn measurements from PA Game Lands
- Prescribed burn weather conditions via consultation with prescribed fire practitioners

Modeling scenarios – 60-year simulation period

- No management (control)
- Repeated burning – return intervals of 2, 5, 10, 20, and 30 years

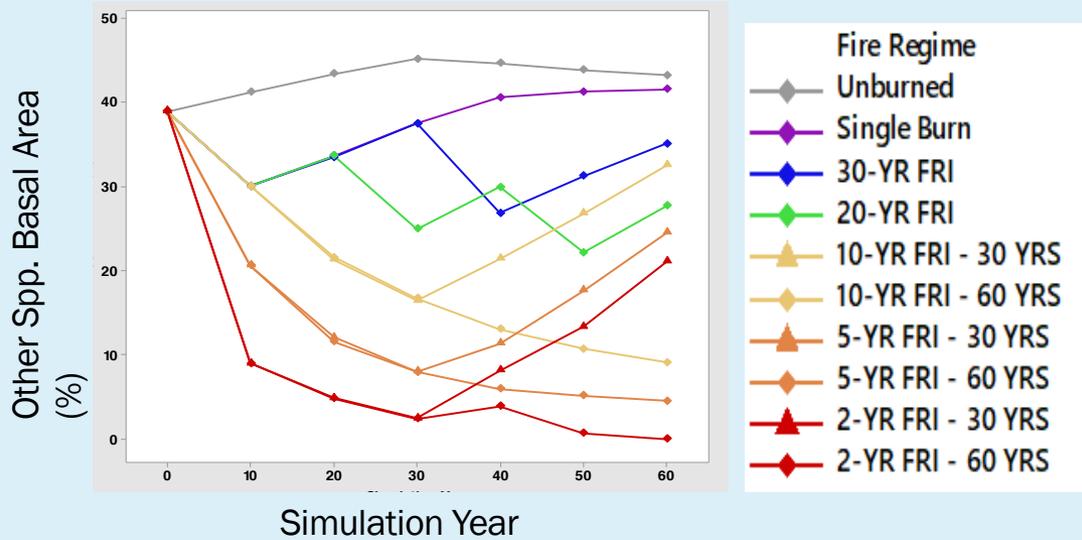
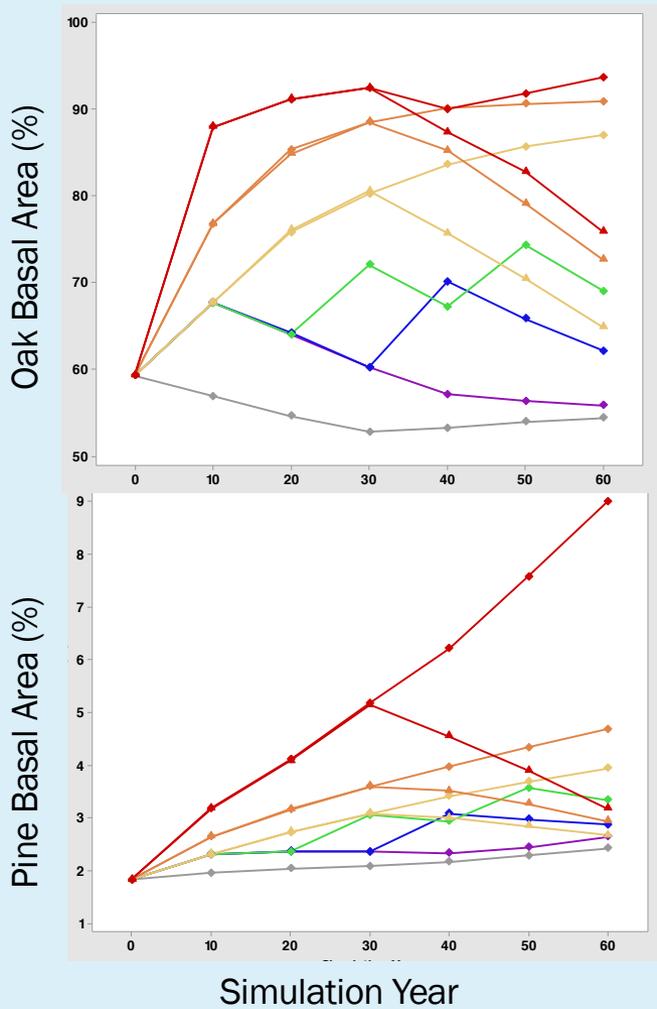
FVS Model Results:

Unburned/single burn not effective

Too frequent burning leads to overall BA decline

Repeated, intermediate burning (10-15 yrs) promotes oak

Goldilocks dilemma



Community

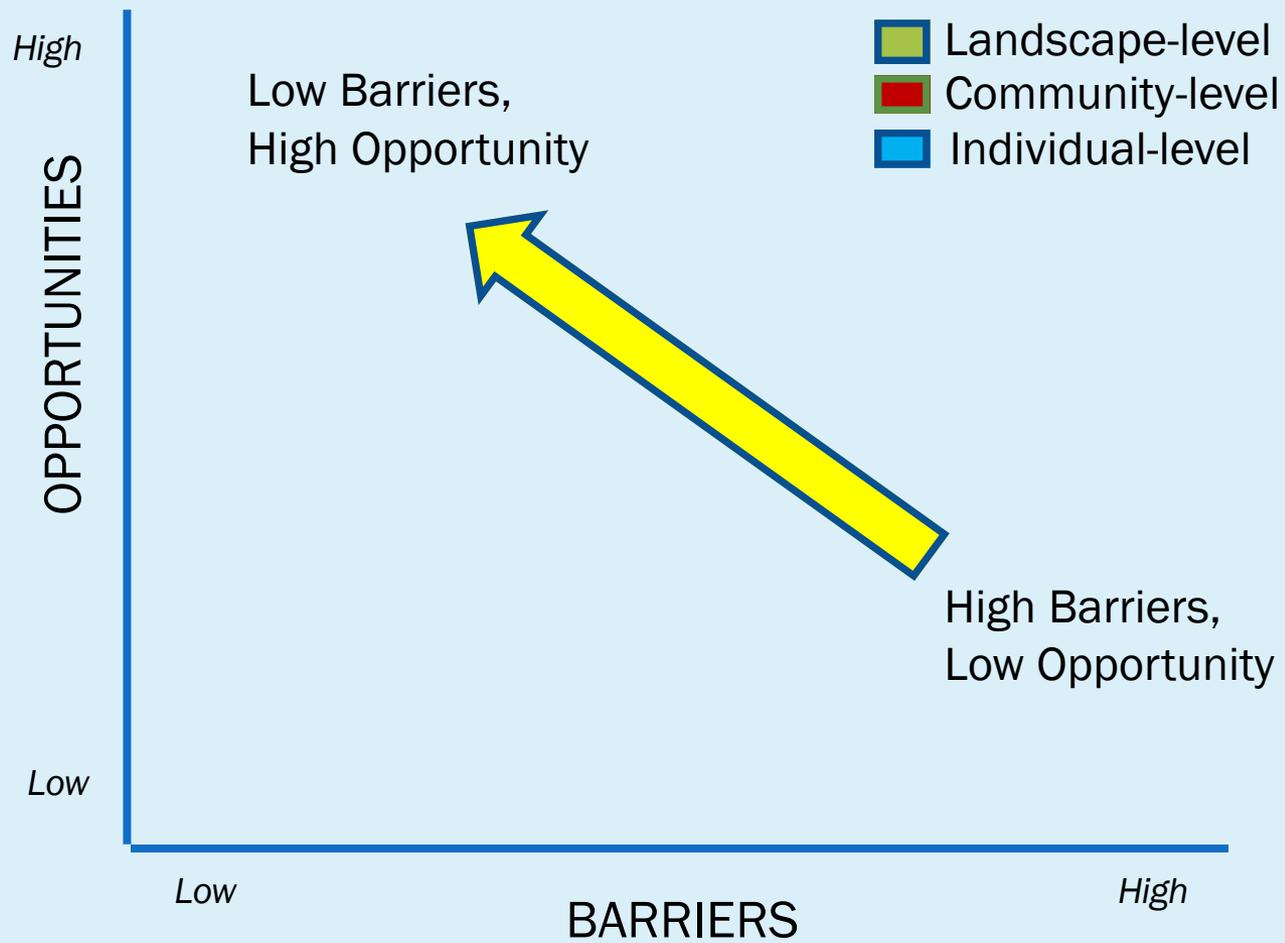
Manager

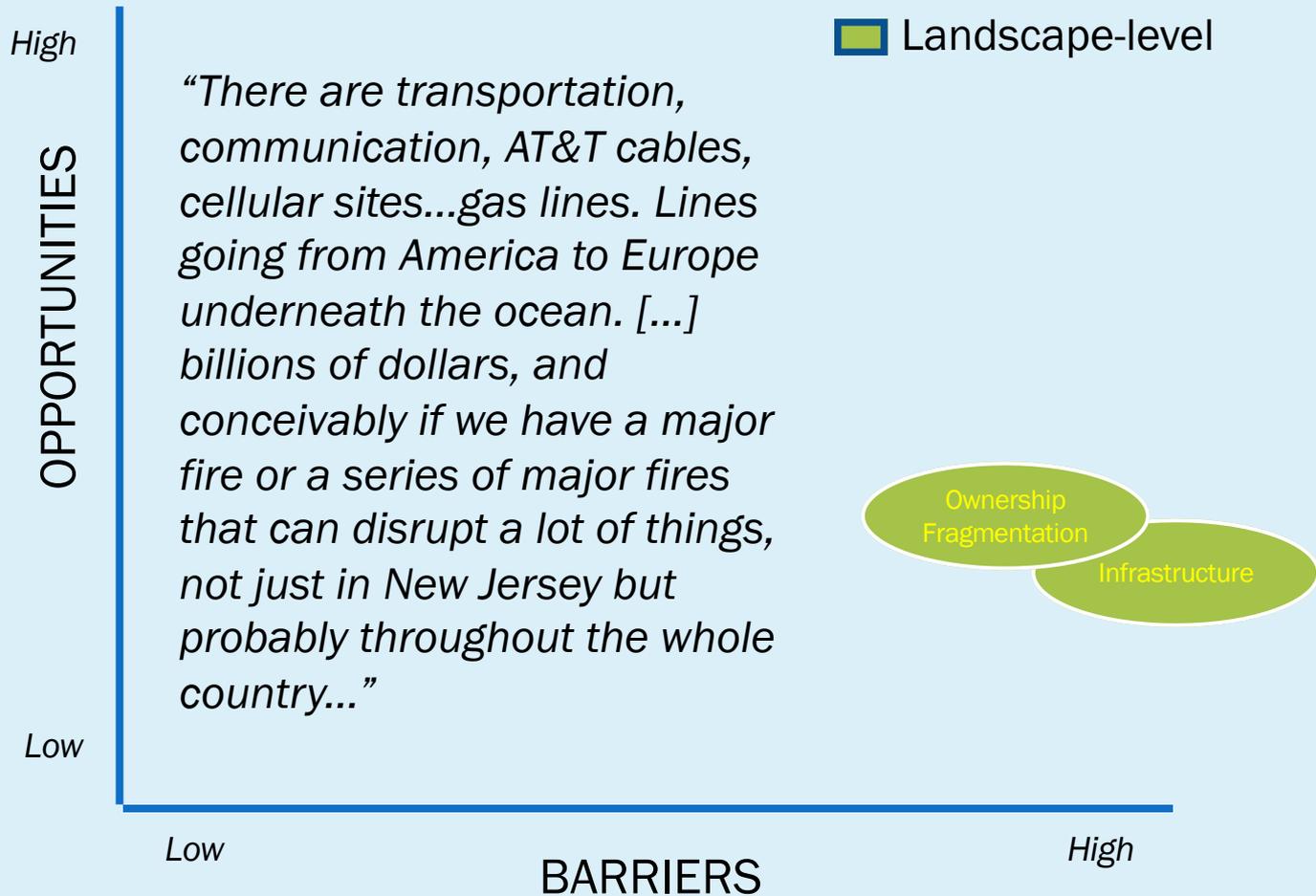


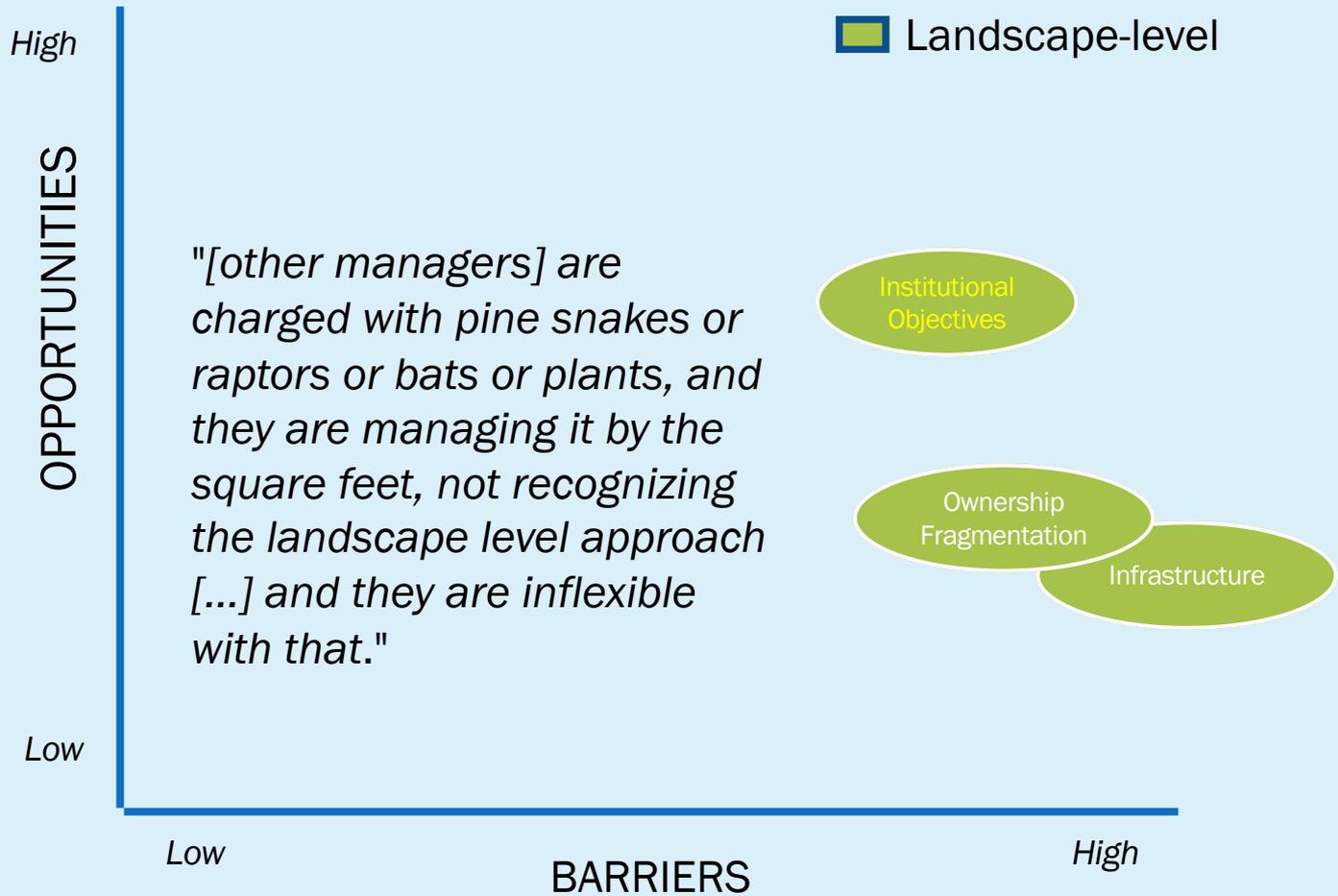
MISMATCH #2

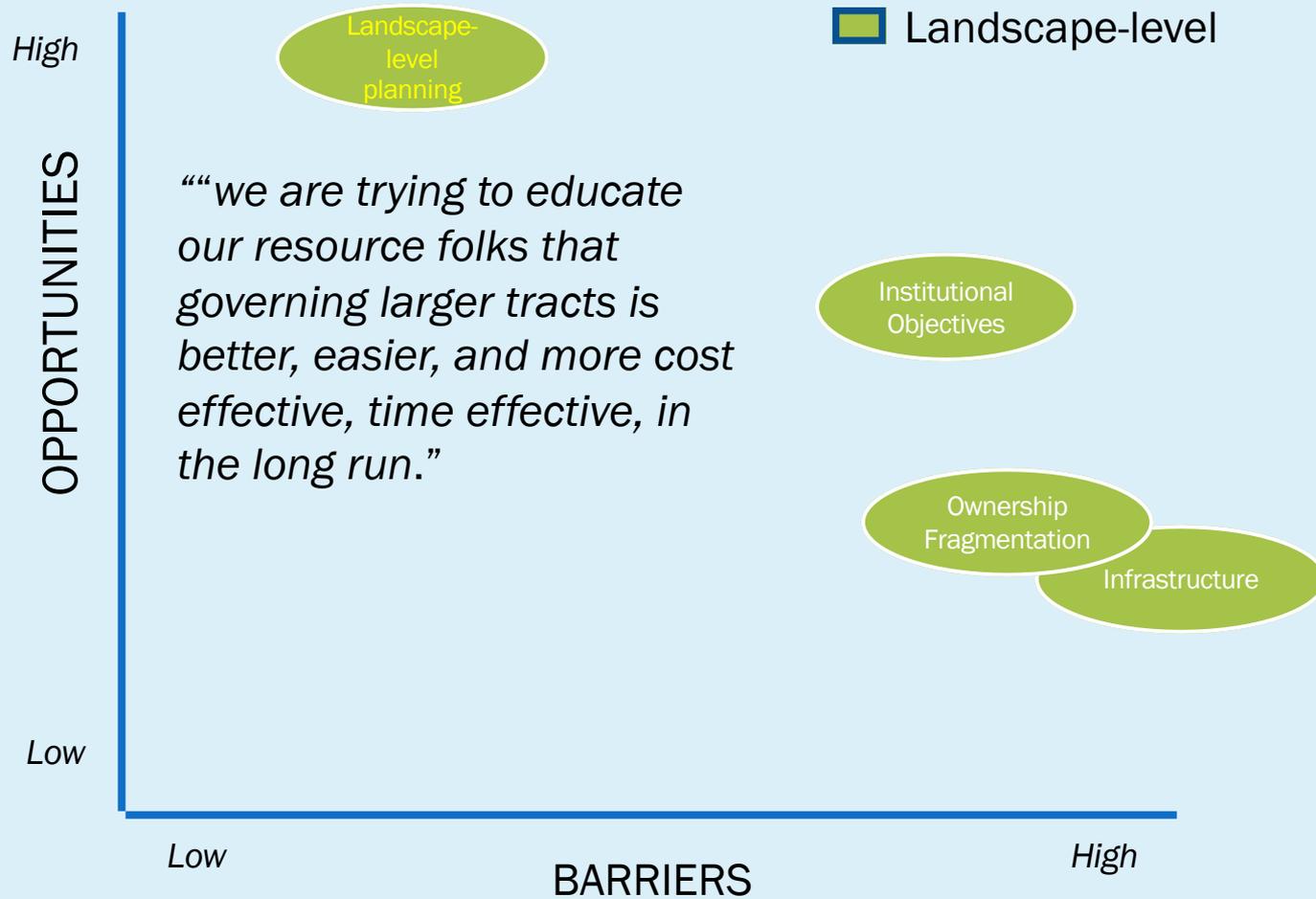
The Scale Dilemma:

Social barriers and opportunities are multi-scalar
(landscape, community, individual)











High

OPPORTUNITIES

Low

NJ: “we support them [cranberry farmers] with whatever they need. Any burnt ground that they are accomplishing is going to help us as far as hazard reduction. You know, it is in our best interest to support them.”

Private/Public partnerships

Limited Experience & Education

PA: “People don’t realize that if somebody is going to come burn your land, it costs money. And now as soon as they hear that, they go ‘Oh, okay. I am out.’”

Community-level

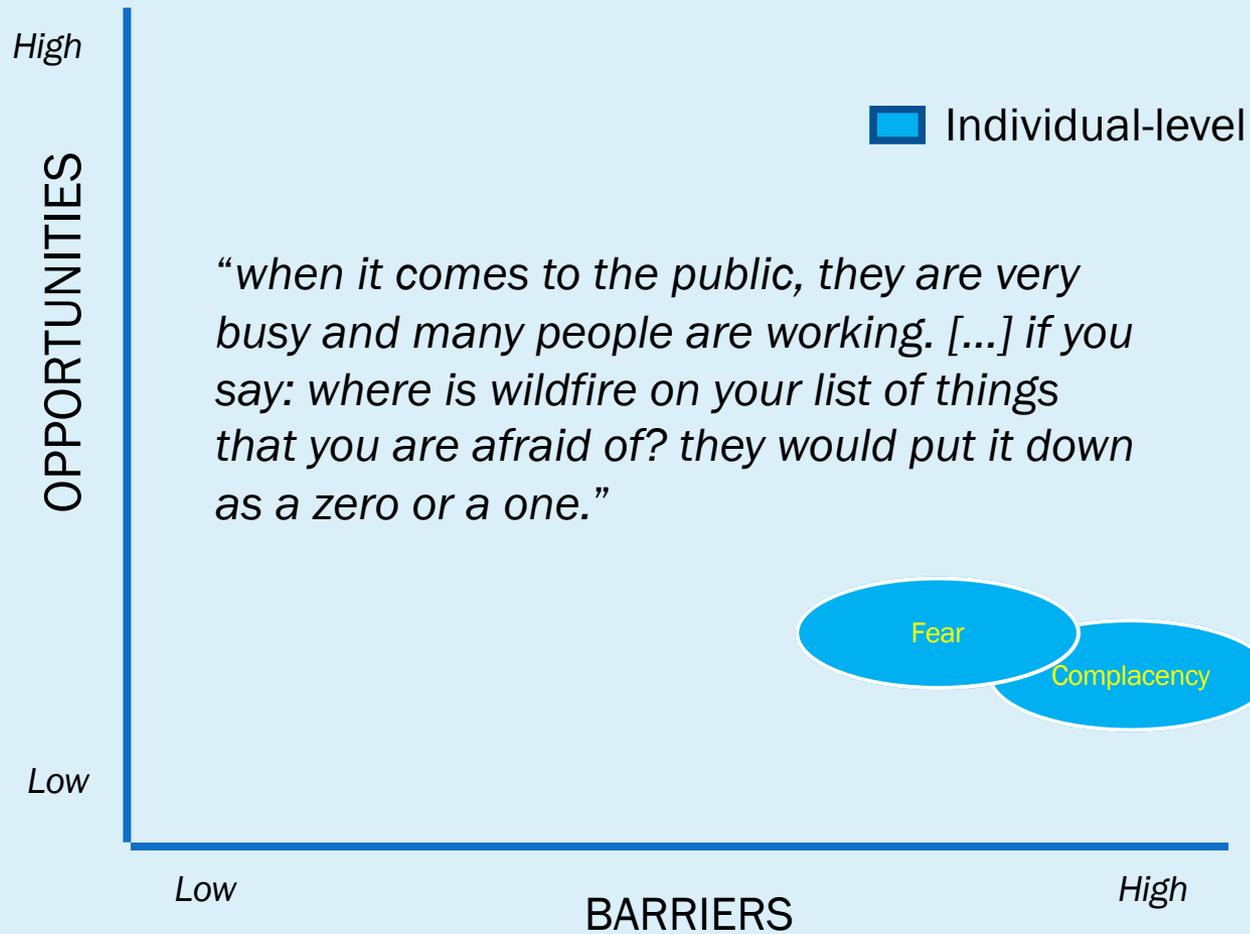


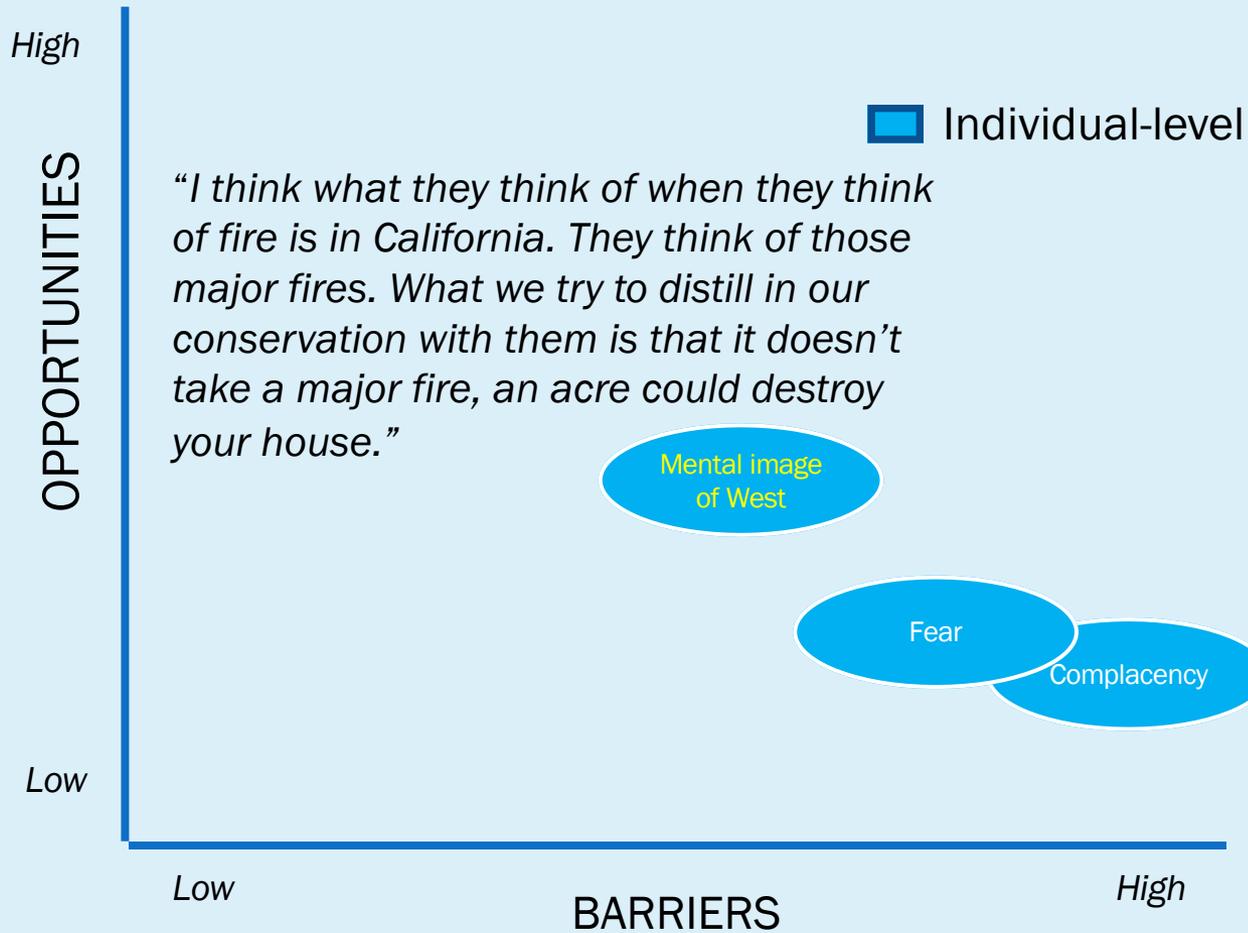
Low

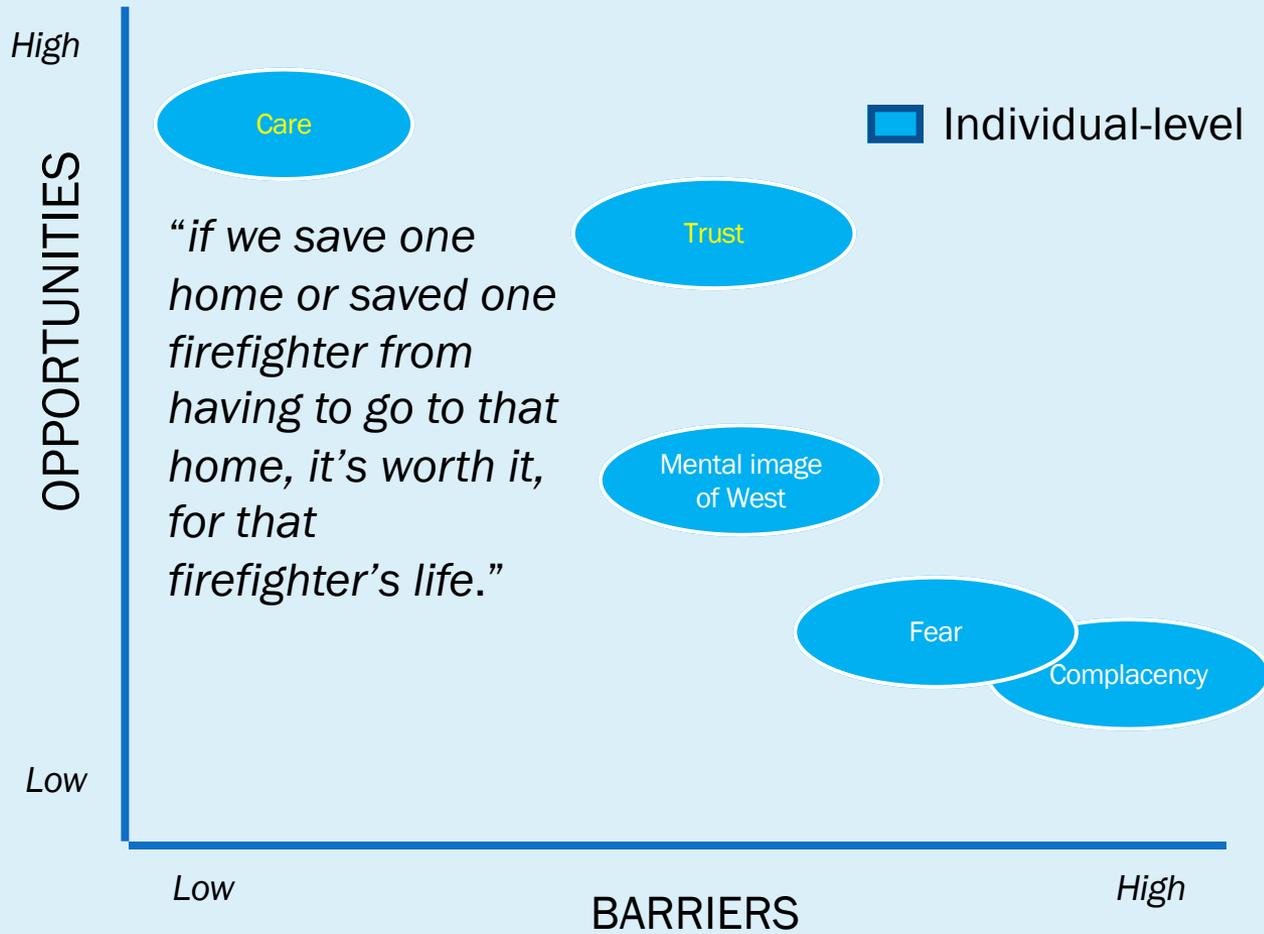
BARRIERS

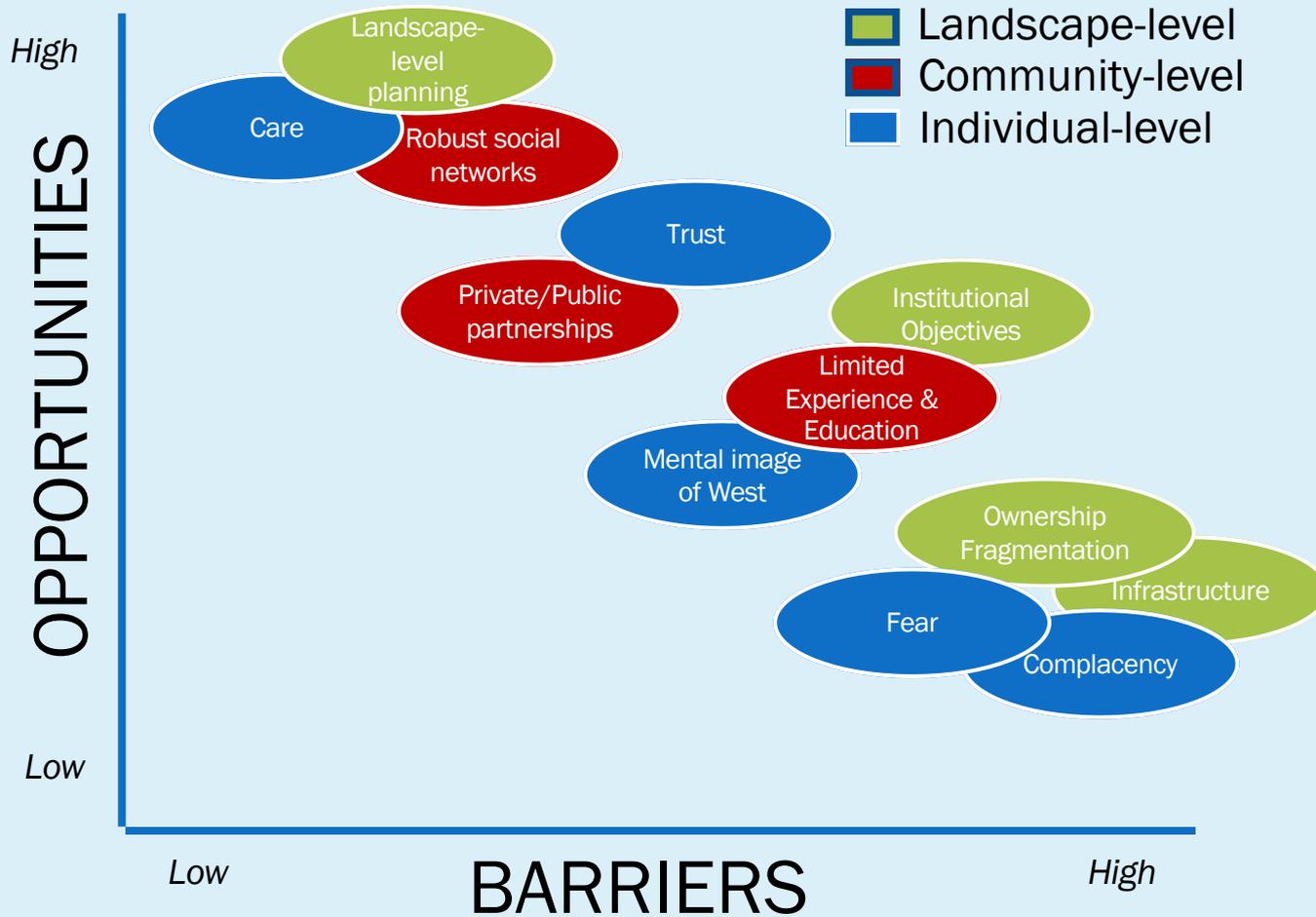
High

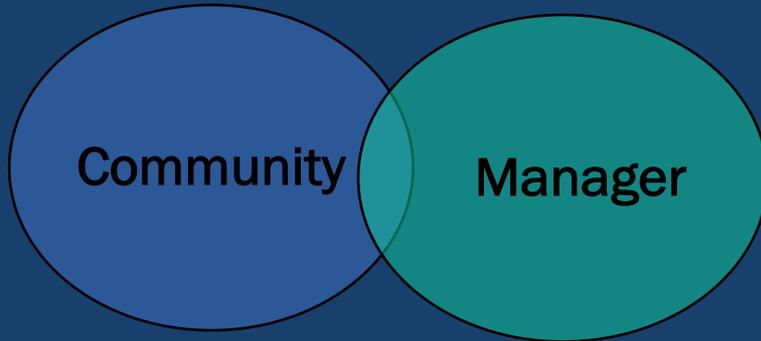












MISMATCH #3

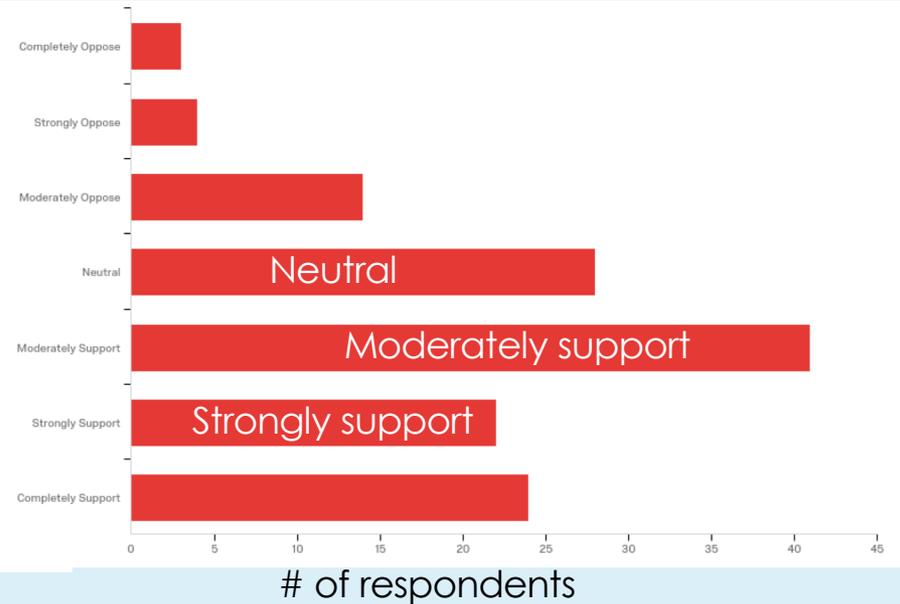
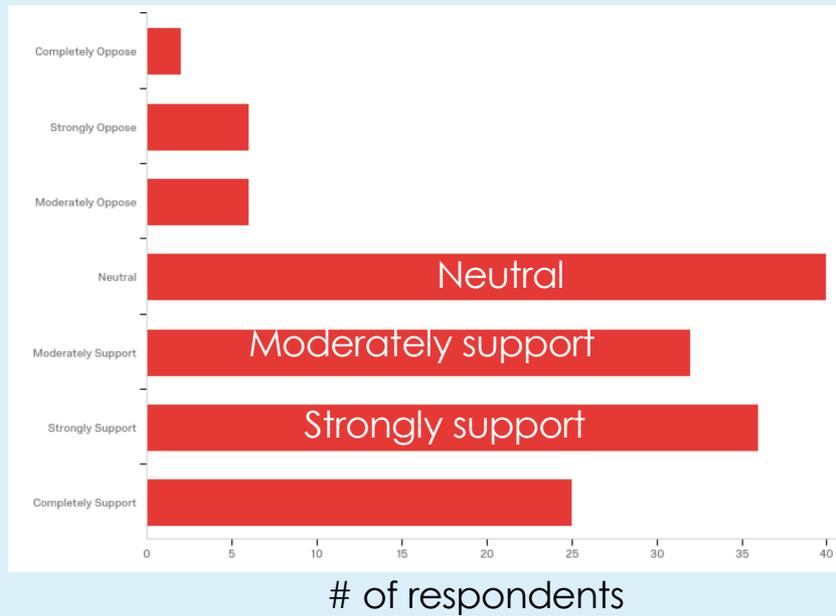
Acceptance

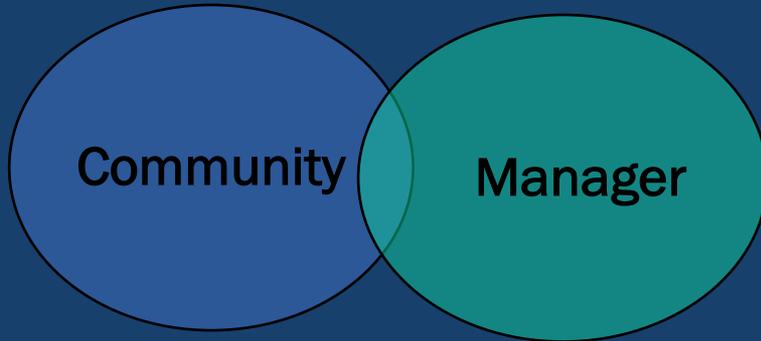
Public is more accepting of fire than managers think

Do you support prescribed burning?

PA

NJ





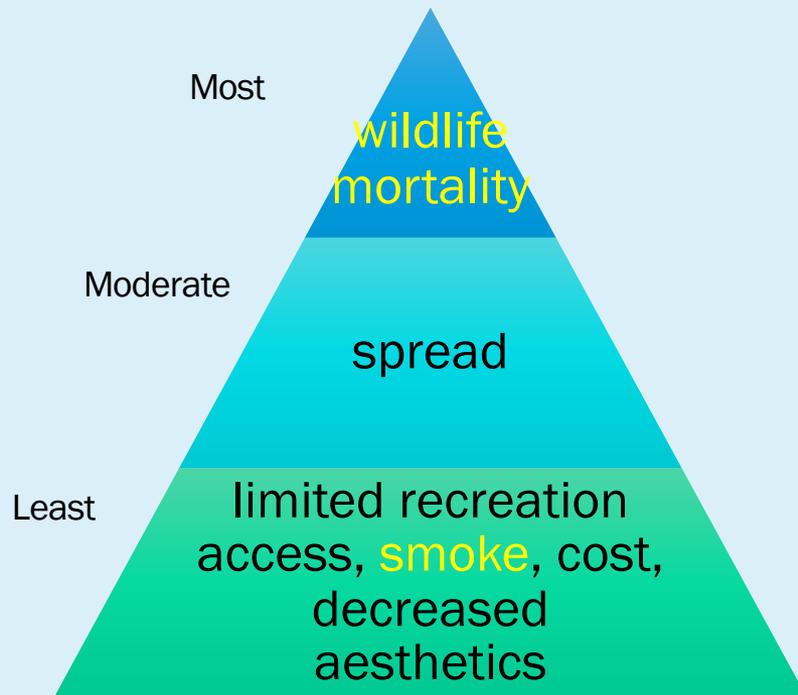
MISMATCH #4

Concerns & Benefits

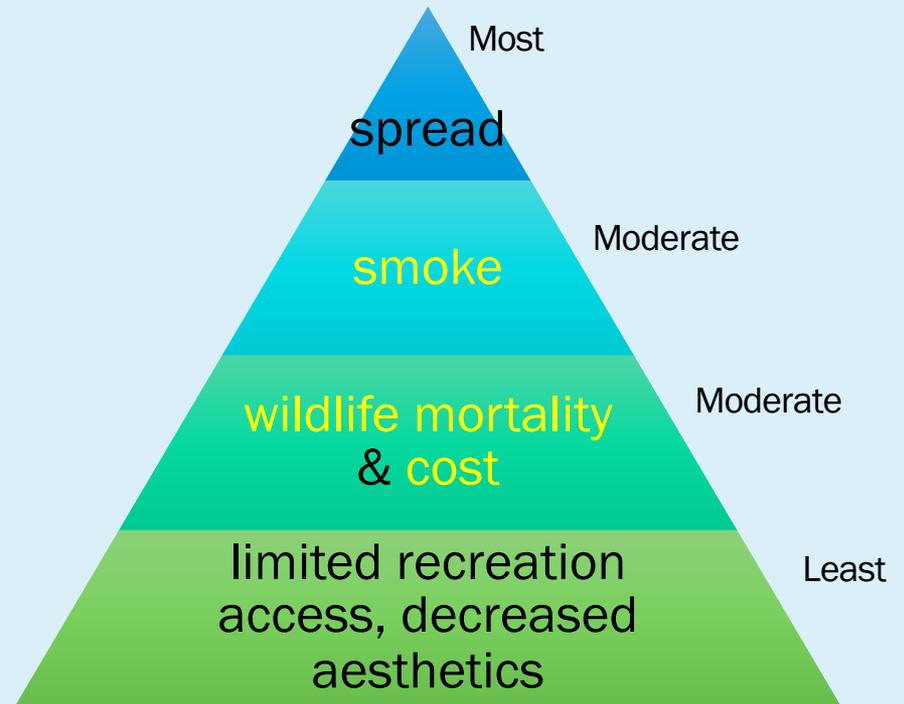
Managers and communities are concerned about different things (and geography matters!)

Concerns

NJ & PA Forest User Concerns

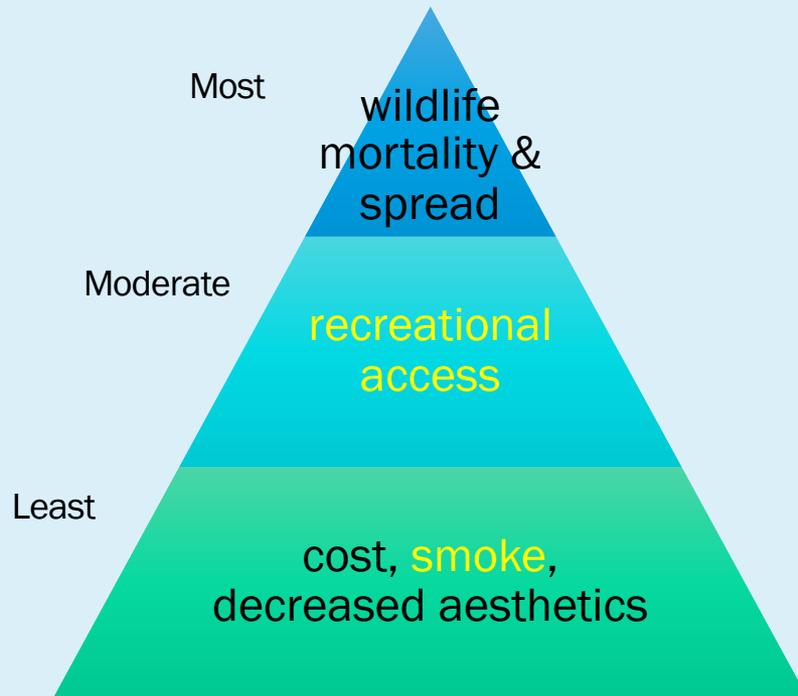


Manager Concerns

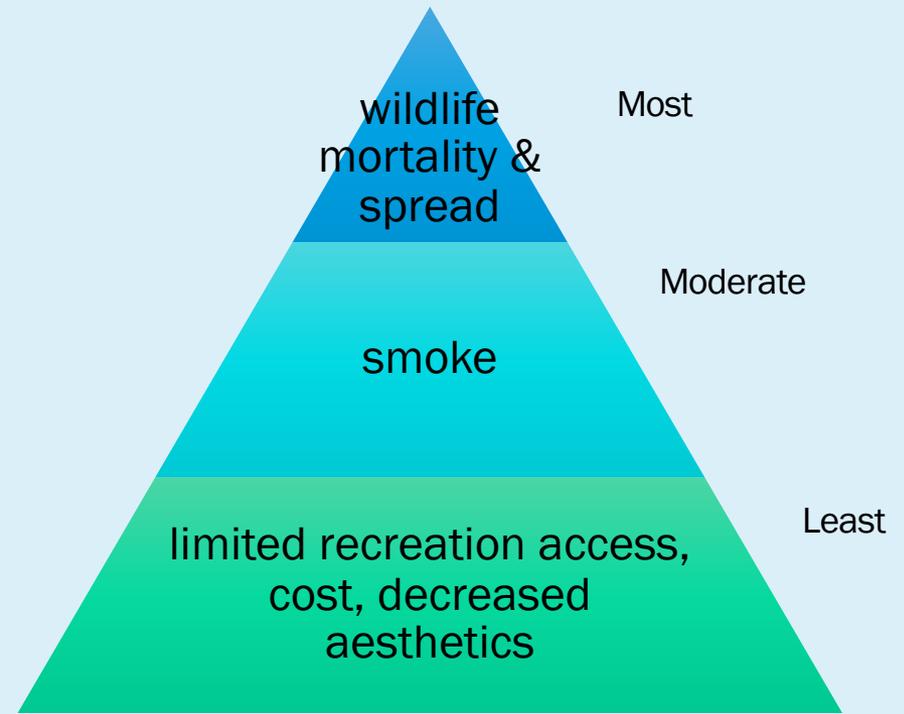


Concerns

PA Forest User Concerns



NJ Forest User Concerns

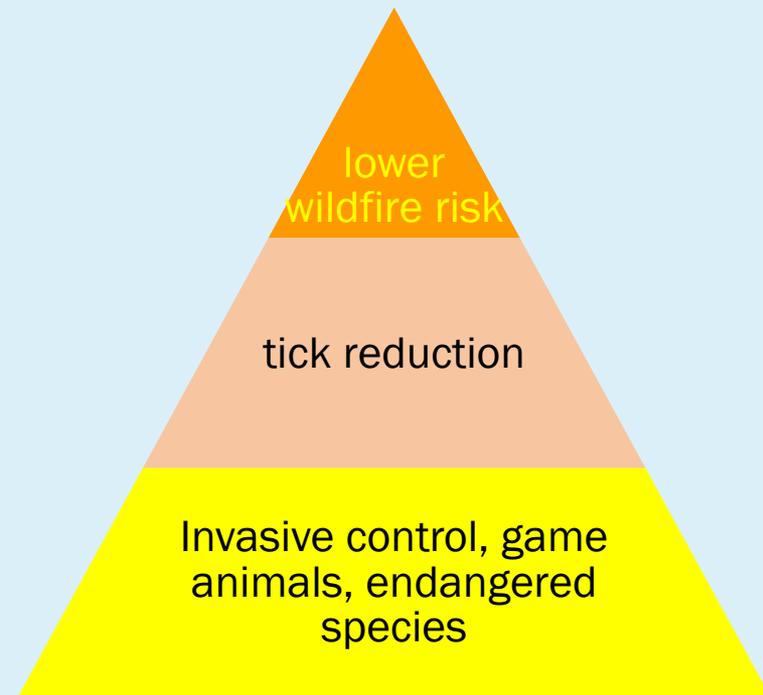


Benefits

NJ+PA Forest User Benefits

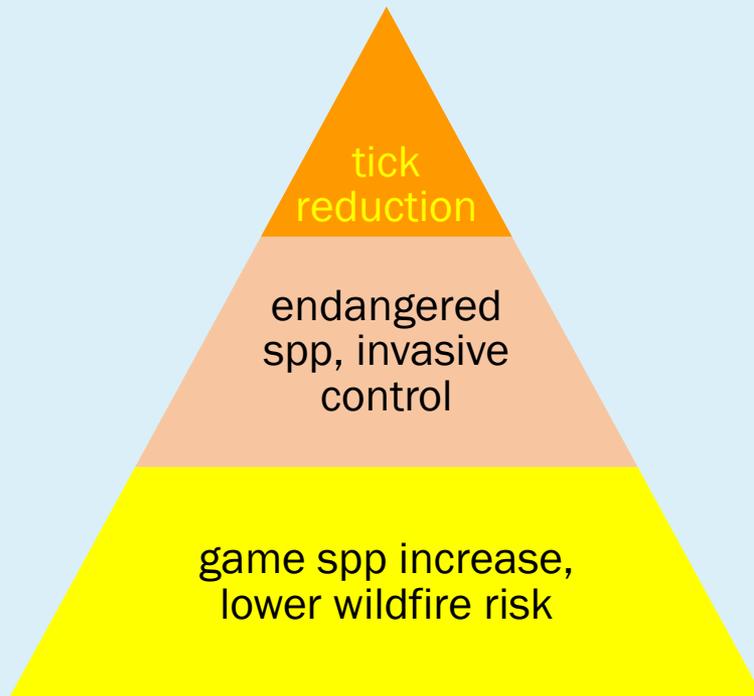


Manager Benefits

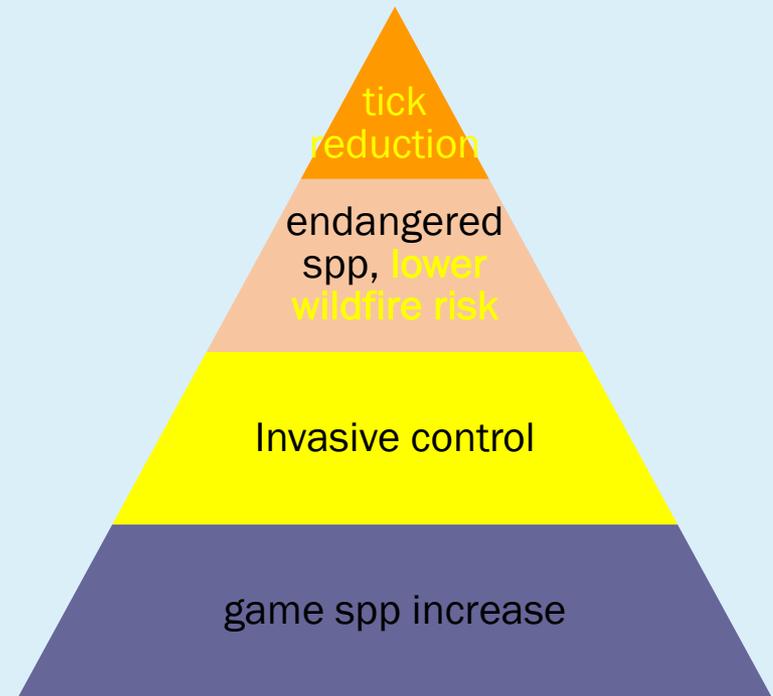


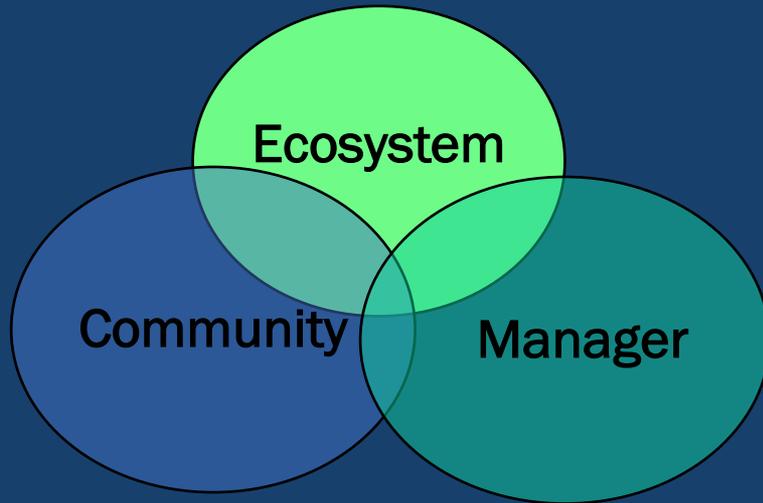
Benefits

PA Forest User Benefits



NJ Forest User Benefits





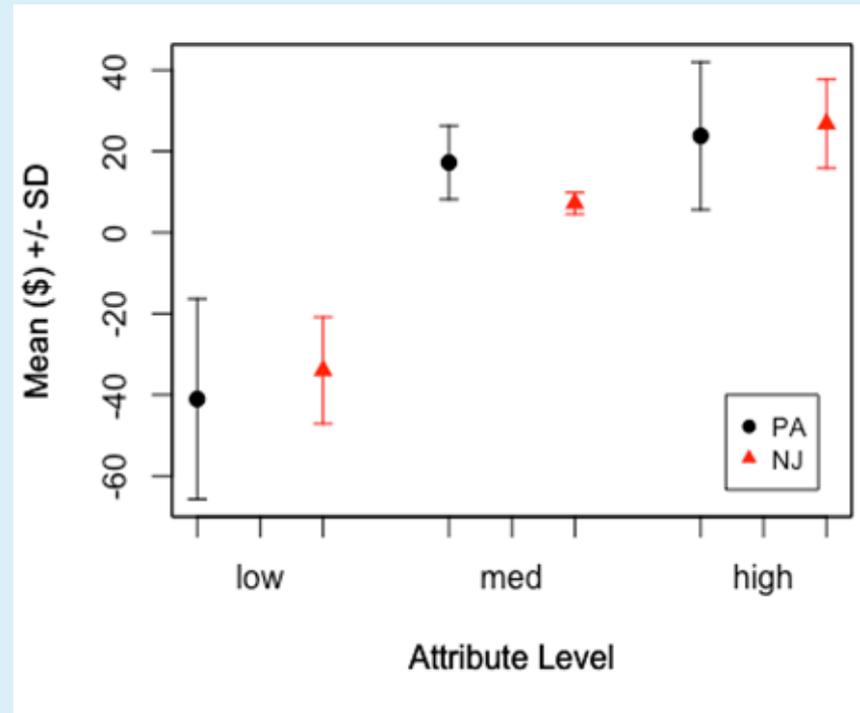
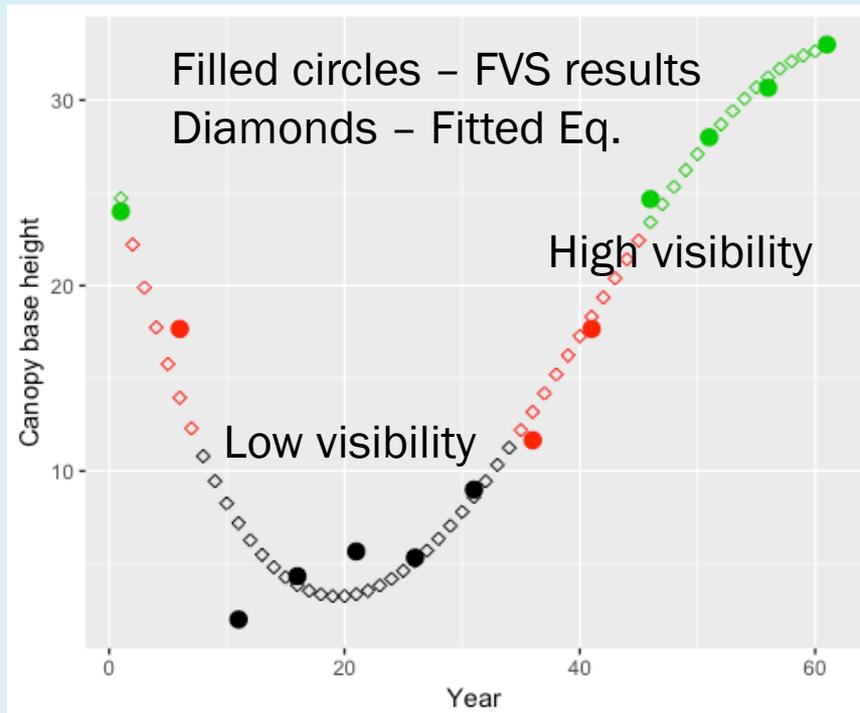
MISMATCH #5

Getting the “right” fire frequency to promote community benefits (e.g., aesthetics, hazard reduction) may not always align with timing for ecological benefits

Example: Visibility

Visibility Attribute
(Canopy Base Height as proxy)

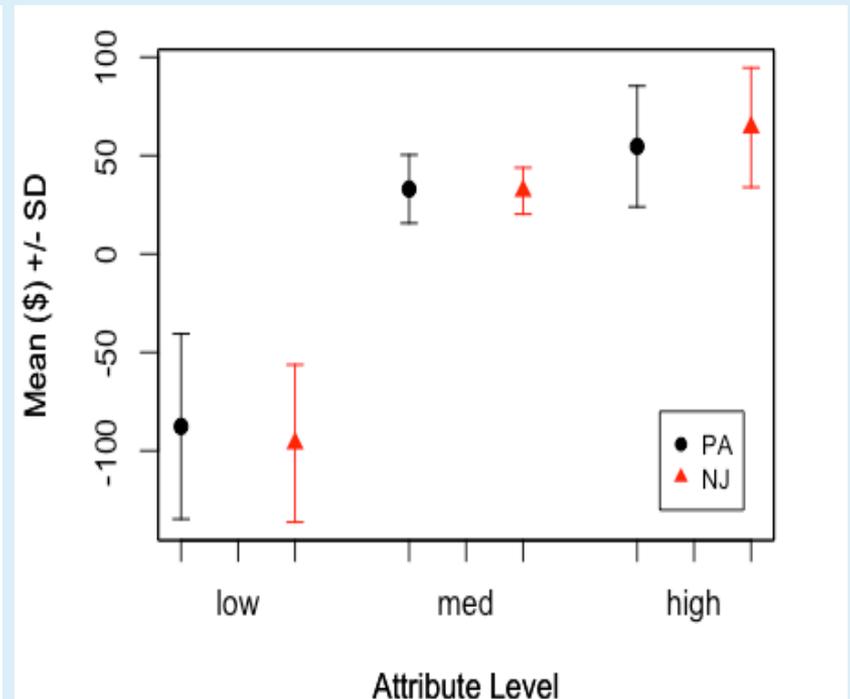
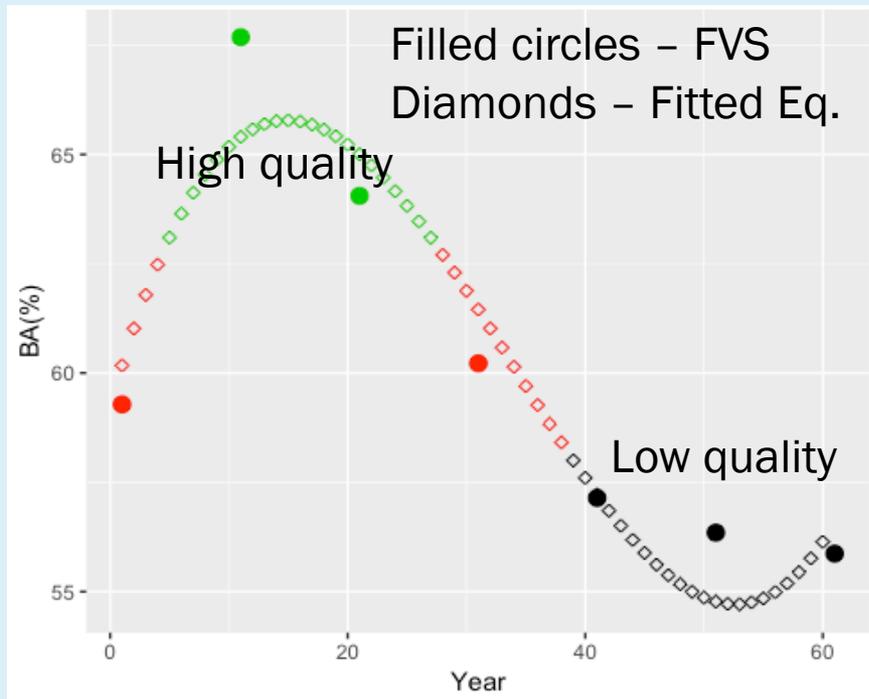
Willingness to Pay
(from community survey)



Example: Habitat Quality

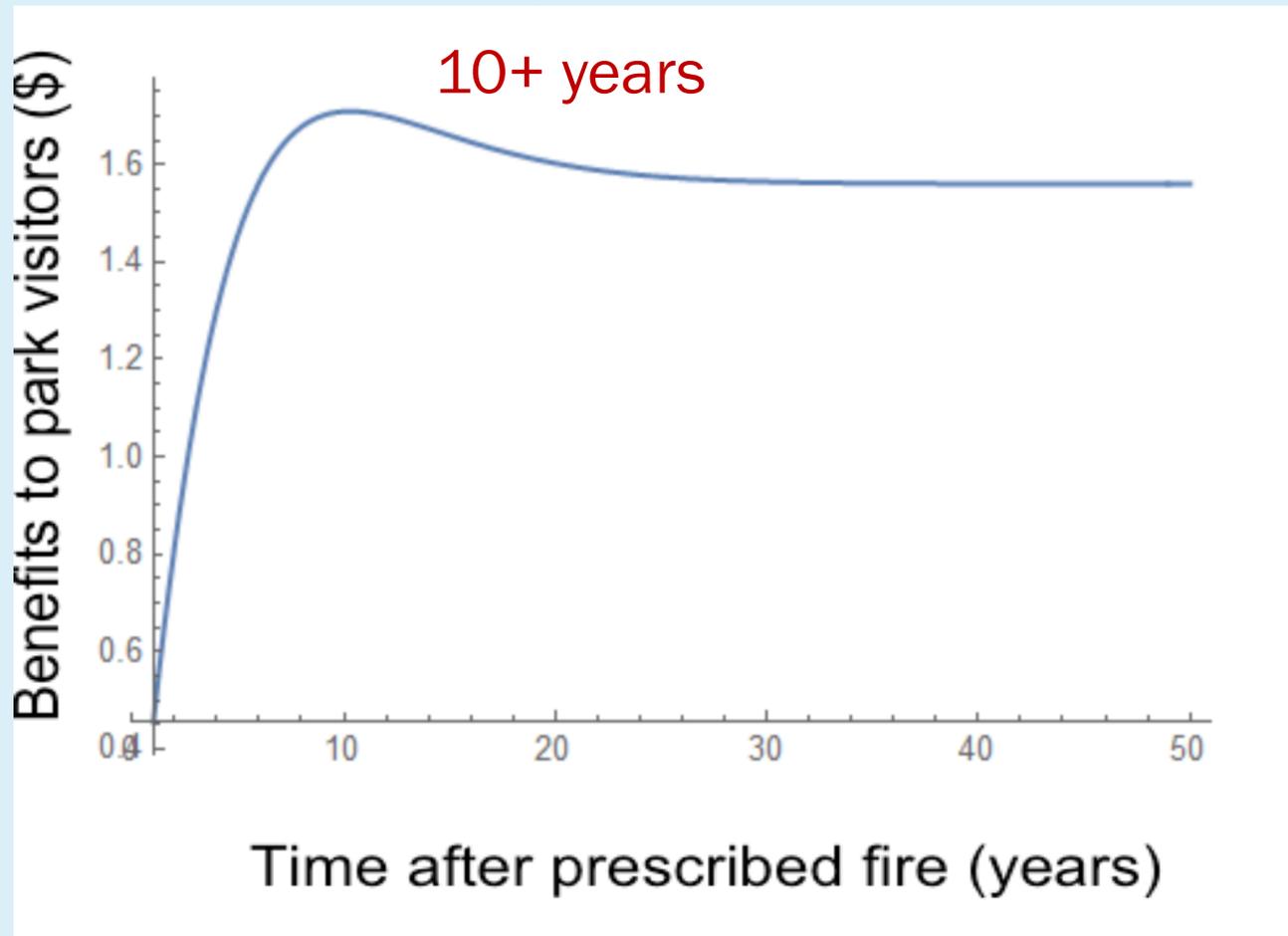
Habitat Attribute
(% Oak Basal Area as proxy)

Willingness to Pay
(from community survey)



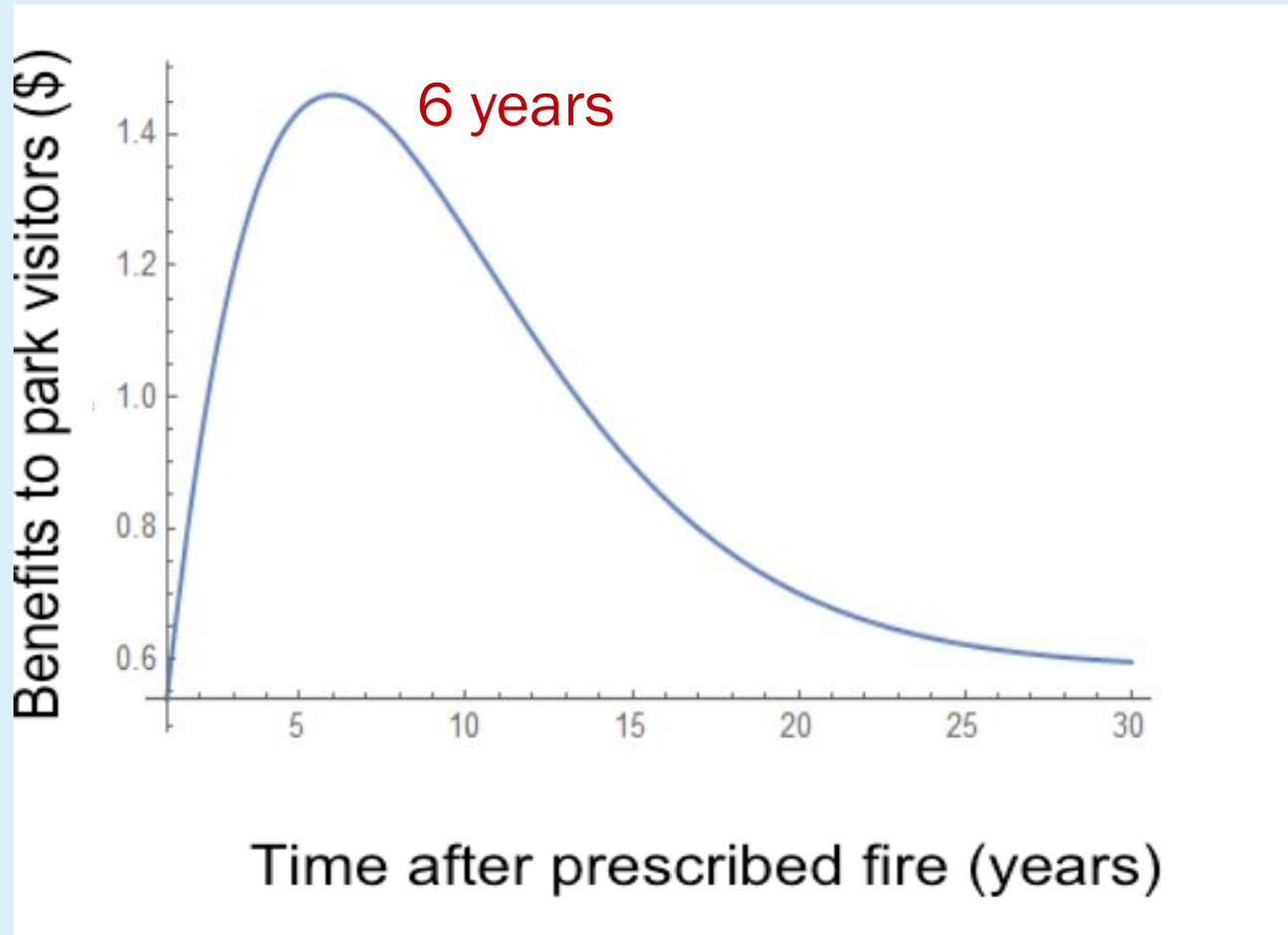
Mixed Oak/Pine - Pennsylvania

Optimal timing of prescribed fires



Pine stands - New Jersey

Optimal timing of prescribed fires



*mis*Matches for Managing mid-Atlantic Firescapes

1) Goldilocks

- Getting the “right” fire frequency to promote the “right” ecological benefits may not match capacity or planning horizons

2) Scale

- Landscape, community & individual-level factors not aligned

3) Acceptance

- Public appears to be more accepting than managers think

4) Concerns & Benefits

- Managers and communities see different concerns/benefits

5) Objectives

- Getting the “right” fire frequency to promote community benefits (e.g., visibility, hazard reduction) may not *always* align with (4)

Matching socio-ecological factors in mid-Atlantic Firescapes

1) Goldilocks

- In PA, burning 10-20 years may be sufficient to achieve goals; but planning horizons needs to extend that far; monitoring!

2) Scale

- Interagency collaborations & network building; a network broker is critical!

3) Acceptance

- Worry (a little less)

4) Concerns & Benefits

- Re-align messaging: specific to community-level concerns and perceived benefits

5) Objectives

- Ensure communities are involved in setting objectives

Thank you

- JFSP 16-1-02-5 Firescapes in the mid-Atlantic: mismatches between social perceptions and prescribed fire use
- The Pennsylvania State University
 - Center for Landscape Dynamics,
 - Institutes for Energy and Environment
- Pennsylvania Bureau of Forestry
- Pennsylvania Game Commission
- NJFFS

