Benefits of Headwater Forest Management

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Outline

- Managing for a mosaic structure in headwater forests
- Benefits and beneficiaries of forest management
- Implications for policy and management

California's headwater forests have changed

Feather River 1890

Resilient mosaic forest

Feather River 1993

Overly dense forest

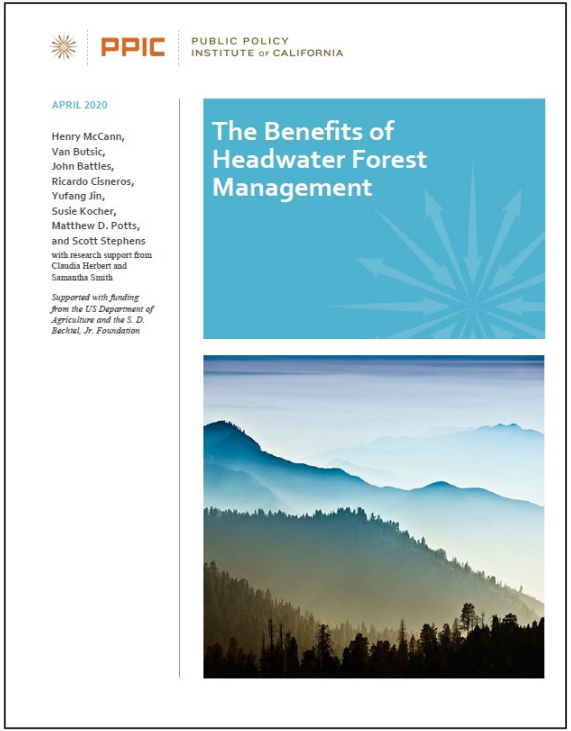
We need to manage for resilient mosaic forests

The goal: A patchwork of varied tree densities, openings, tree sizes

A mosaic of trees in the Stanislaus-Tuolumne Experimental Forest

Long term stewardship will be a heavy lift

- Increased focus on forest health at local, state, and federal levels
- But efforts must be expanded, continue over long term
- Understanding benefits and beneficiaries is key step to motivate efforts, identify partners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The Benefits of Headwater Forest Management

Outline

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Improving forest health brings many benefits

- Support the well-being of rural communities
- Reduce smoke impacts on public health
- Store carbon and reduce emissions
- Protect water quality
- Increase water supply

Support the well-being of rural communities

- Create economic opportunities for rural residents
- Decrease wildfire threats

Considerations:

- Investing in infrastructure, workforce training is essential
- Home hardening, defensible space, safety planning also key to building wildfire resilience

Businesses in a Sierra community

Reduce smoke impacts on public health

- Managing forests with fire generates smoke but is more controlled, has lower health risks

Considerations:

- Frequent but less concentrated smoke will be common in region
- Mechanical thinning has no smoke impacts

Smoke from large fires can last many weeks

Store carbon and reduce greenhouse gas emissions

King Fire devastation

- Small trees store carbon but increase fire vulnerability
- Channeling growth into large trees increases durability of forest carbon while limiting wildfire emissions

Considerations:

- Accounting for forest carbon changes is difficult
- Choice of management tools affects overall carbon balance

Protect water quality from post-fire erosion

- Wildfires can wash sediment, debris into streams
- Sediment & debris interfere with water infrastructure, harm aquatic ecosystems

Considerations:

- Large foothill reservoirs somewhat buffered by smaller upstream reservoirs
- Each tributary has different levels of risks, vulnerable assets

Post-fire sedimentation, American River

Increase water supply

Feather River

- Thinning trees can increase runoff in wetter tributaries
- Potential link between lower-density forests and snowpack enhancement

Considerations:

- Benefit shrinks as vegetation grows back
- Uncertainty at large scales

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Managing for multiple benefits is a matter of design

Forest health project map

- Mosaic structure increases forest resilience, provides benefits
- Useful model for designing projects, but no single blueprint for success
- Implementation should allow for experimentation, landowner preferences

Benefits extend beyond the headwater region

Wildfire smoke in downtown Clovis, CA

- Several benefits extend well beyond the headwater region
  - Reduced smoke impacts
  - Sequestering carbon
  - Water quality & supply
- More general funding models may be appropriate when benefits extend outside the region

Uncertainties need to be addressed

- Uncertainties about location, magnitude, and duration of benefits—especially on increasing water supplies, storing carbon
- Filling knowledge gaps will bring more clarity about benefits

Water cycle measurement, Kings River basin

Beneficiaries can play important roles

Collaboration on North Yuba River project

- Advocate for expanded forest health efforts
- Organize groups of stakeholders around forest health
- Provide funding for forest management efforts that benefit themselves and others
- Develop policies that facilitate larger, more effective management efforts

Healthy forests build regional, statewide resilience

- Management improves forest resilience to wildfire
- Broad benefits for many stakeholders in region and state
- Next steps require heavy lift by public and private entities

A resilient stand of trees, Illilouette Creek Basin

Thank you!

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About these slides

These slides were created to accompany a presentation. They do not include full documentation of sources, data samples, methods, and interpretations. To avoid misinterpretations, please contact:

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Thank you for your interest in this work.