FOREST RESILIENCE BOND

Enlisting Private Sector Support for Multi-Benefit Natural Climate Solutions

April 2022

BERKELEY LAB
Lawrence Berkeley National Laboratory

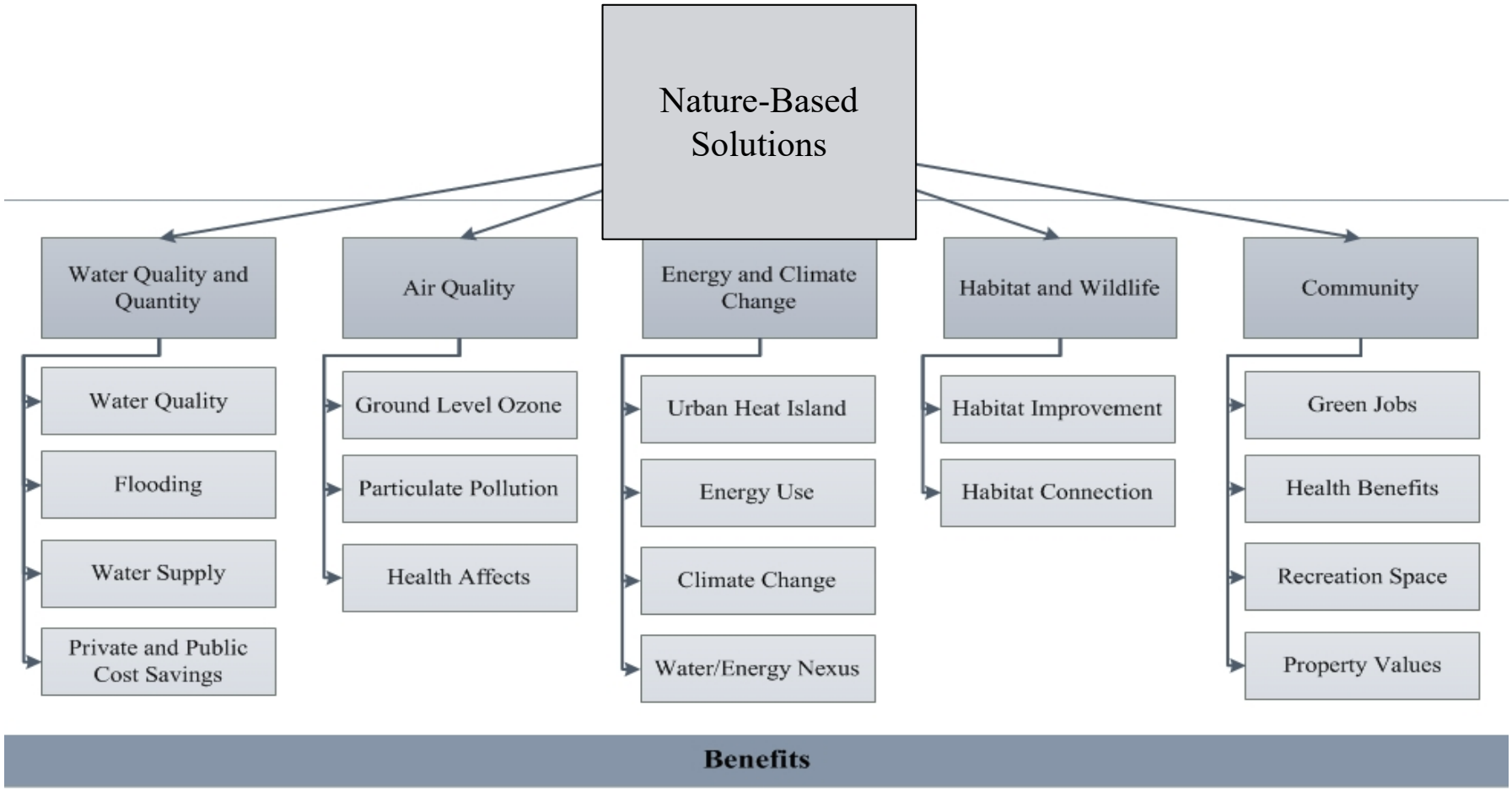
BLUE FOREST CONSERVATION

Fighting Nature to Working with Nature






Overview: Nature Based Solutions



What are the barriers to implementation?

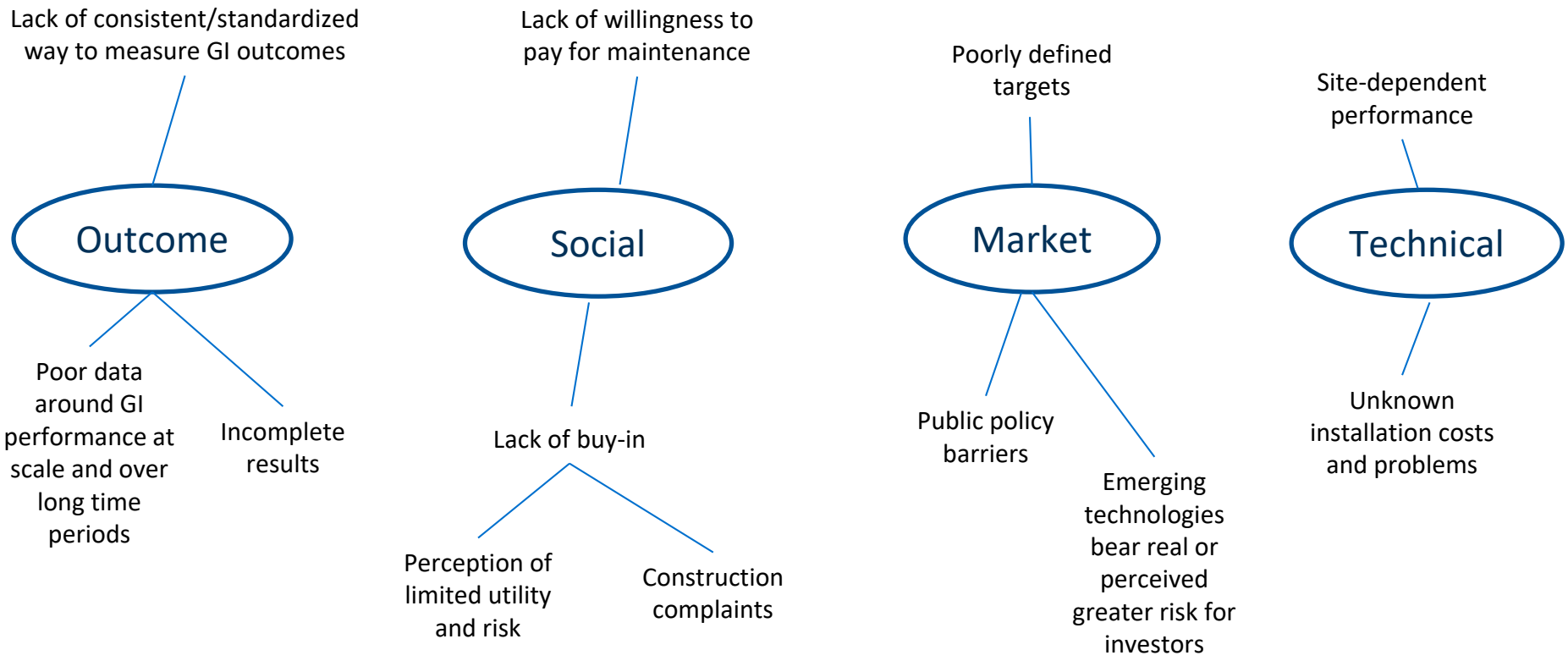
Regulatory rigidity

- What is infrastructure?
- How do you measure performance of green and nature-based solutions?
- Where would the money come from in the absence of federal and state dollars ?

Fragmentation

- Who is involved and why?
- How do you measure performance across agencies, regulatory bodies?
- Where should the money come from?

Managing Risks



Case Study: Wildfire Challenge; Forests as Natural Capital

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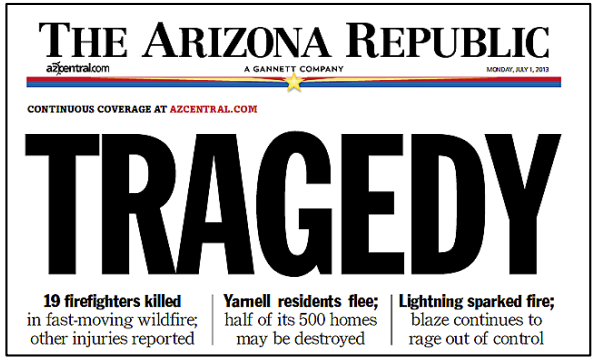
West's Biggest Natural Disaster Threat



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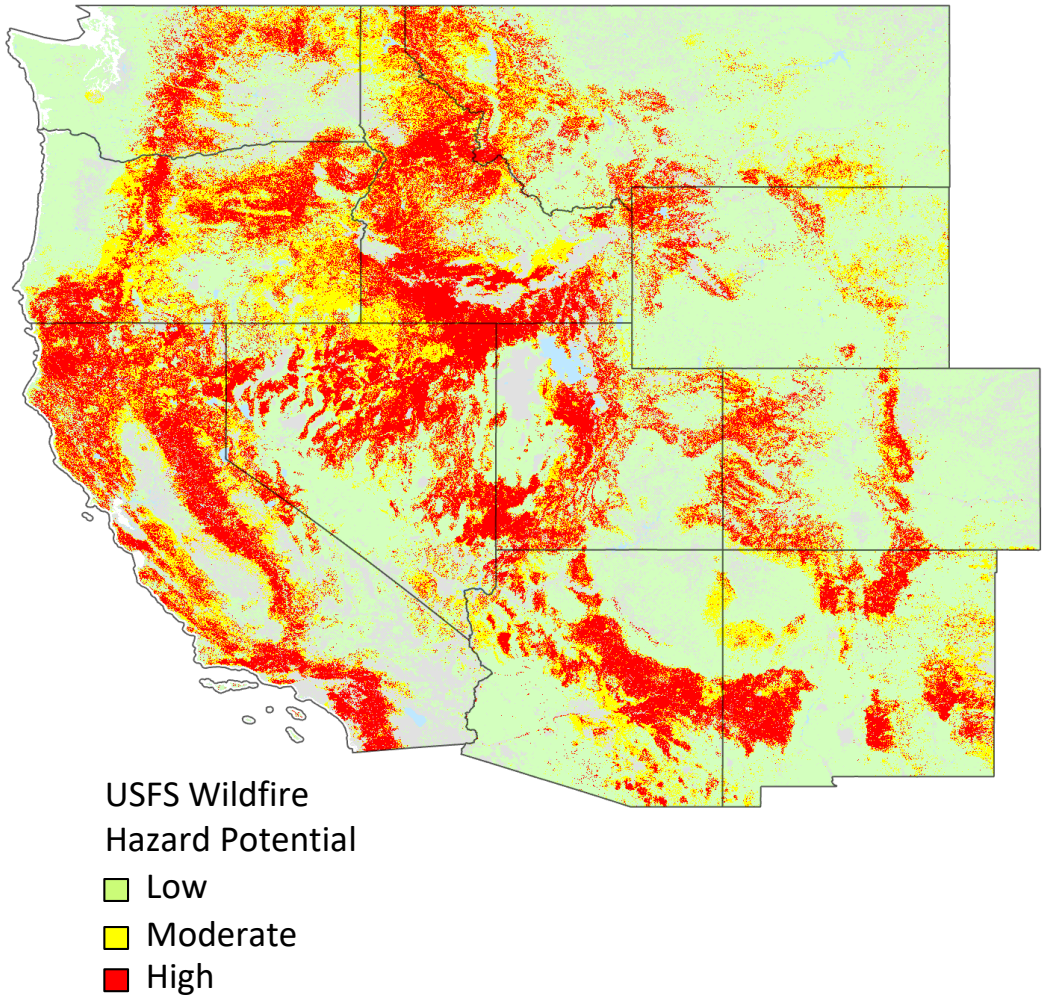
Western US Forests & Communities at Risk



- 58mm acres at moderate to high wildfire risk
- Over $220B property at extreme risk
- $76B-130B long term annual health risk
- 65% of CA water supply originates in forested watersheds
- CA forests becoming net carbon emitters

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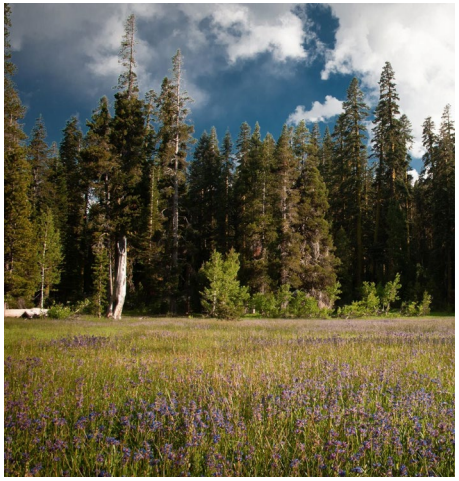
Proven Solution: Forest Restoration



- Mechanical and hand thinning
- Prescribed fire
- Meadow restoration
- Invasive plant removal
- Native aspen regeneration
- Road decommissioning

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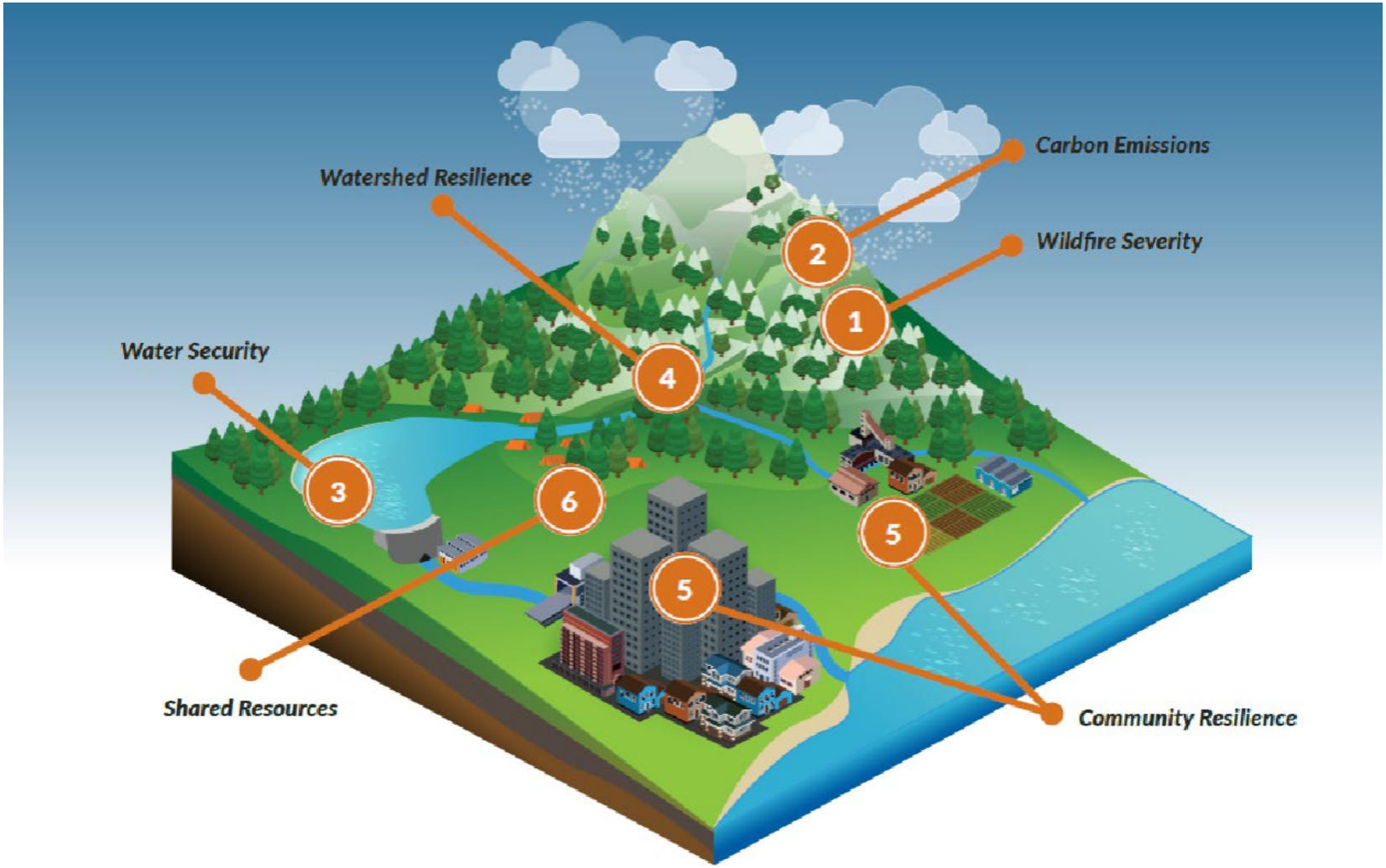
Multiple Benefits of Forest Restoration



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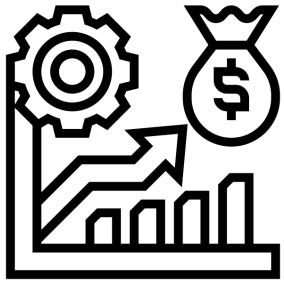
What Motivates Beneficiaries to Participate?

Revenue enhancement



- Increased water supply, hydropower, carbon
- Tax revenue from recreation-based tourism
- Meeting corporate water targets

Cost avoidance or risk mitigation

- Decreased risk of severe wildfire
- Protected water quality, infrastructure
- Avoided liability

Regulatory efficiencies

- Aquatic habitat obligations
- TMDL requirements

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Connecting Investor Capital to Conservation

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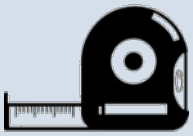
Ecosystem Services

Fire, water, and hydro benefits valuable to stakeholders

Evaluation of Benefits



Quantifies benefits accruing to multiple stakeholders

Innovative Contracts

Monetizes multi-faceted benefits as payments

Financial Vehicle

Converts contractual payments into investor returns

Investor Capital

Immense, untapped resource to finance conservation

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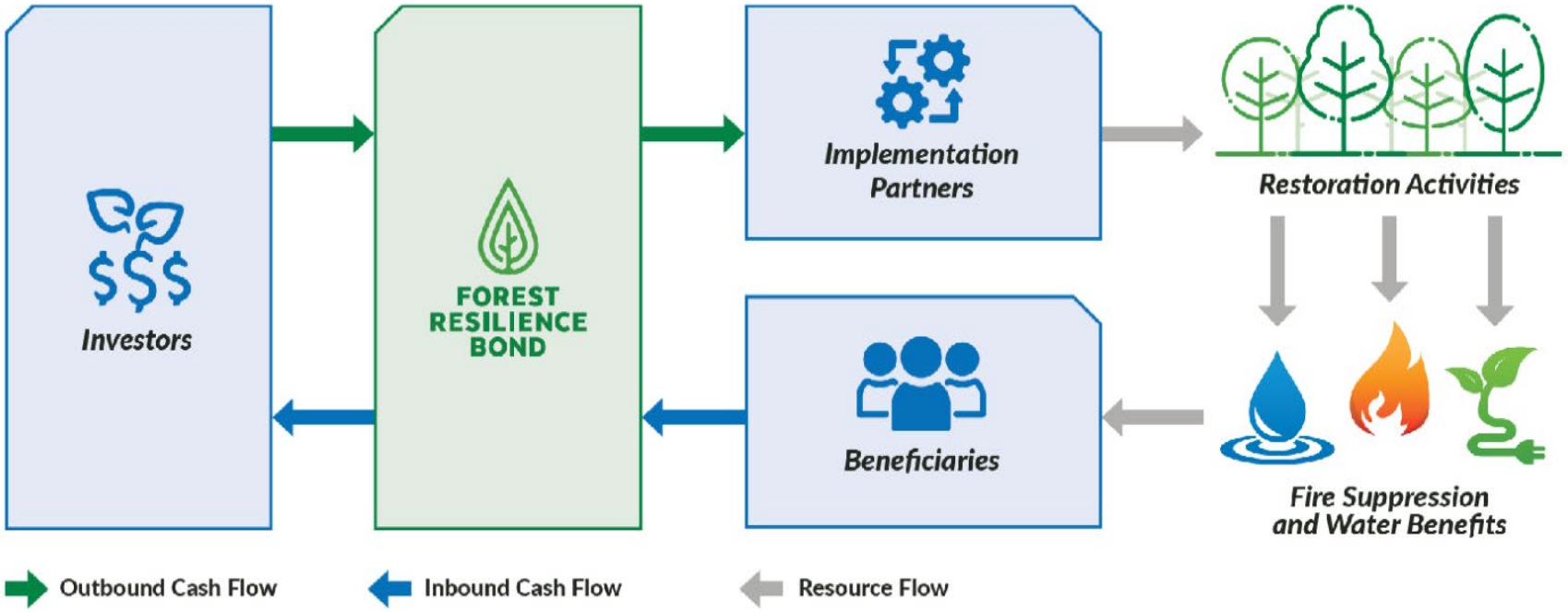
The Forest Resilience Bond



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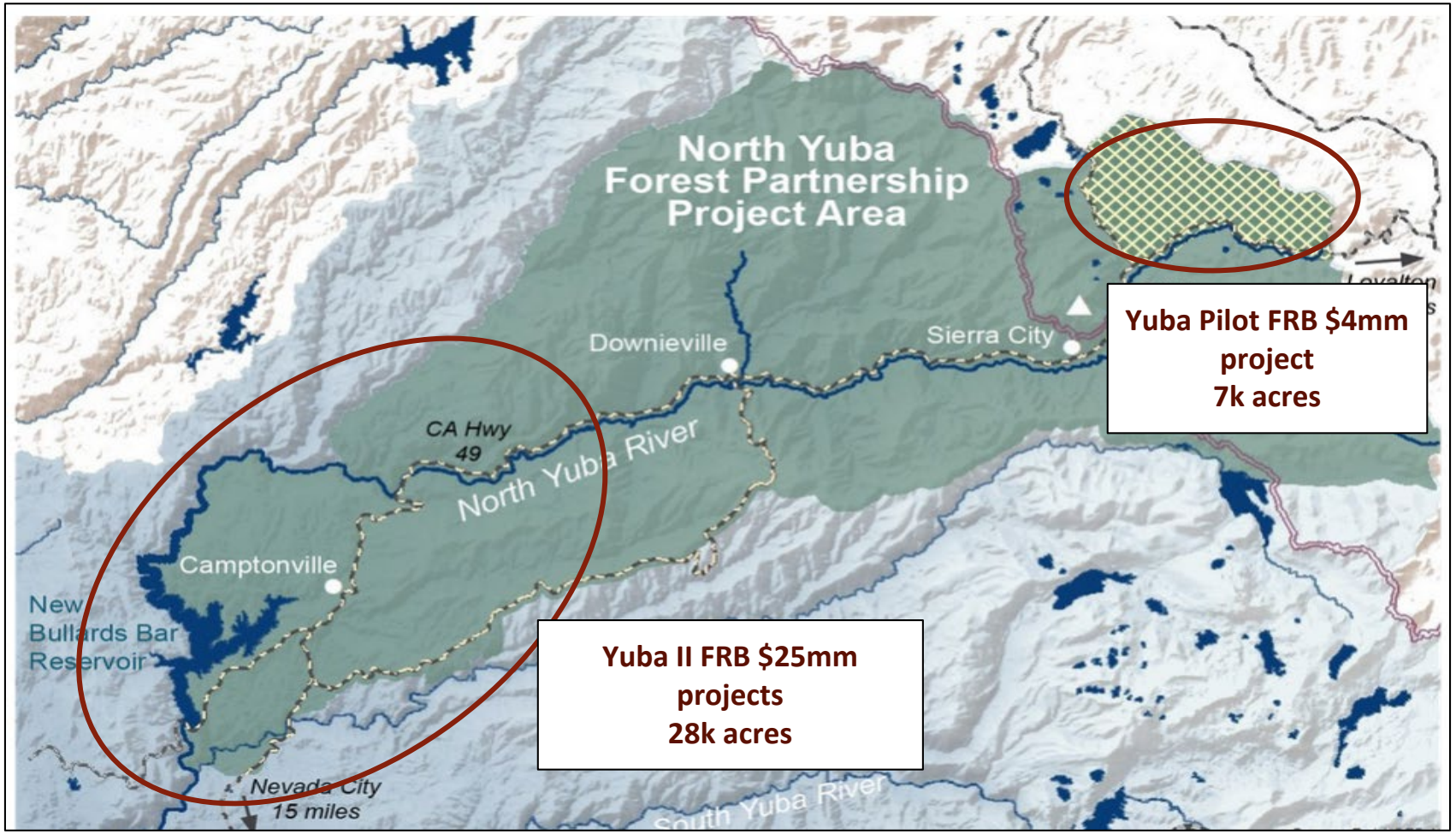
The FRB: From Pilot to Scale



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USFS Testimonial

"Typically, a large restoration project such as Yuba would take over ten years, if ever fully implemented. Instead, **we will complete it within three years.** This means a healthier, more resilient forest before insects, disease or wildfire negate our planning and before our communities are adversely impacted."

- Alonzo "Lon" Henderson, District Ranger, Tahoe National Forest

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FRB Project Pipeline

Level of Engagement	National Forest or Project
Explore	*National Forest:* San Bernardino, Stanislaus, Sierra, Montana/ R1 *Other:* Bear River (UT), Natural Areas Conservancy (NY), Nearshore and Salmon Health (WA)
Design	Eldorado, Lake Tahoe Basin, Klamath, Rogue River-Siskiyou, Mt. Baker-Snoqualmie, Okanogan-Wenatchee
Active Project	Tahoe (Yuba I), Tahoe (Yuba II)

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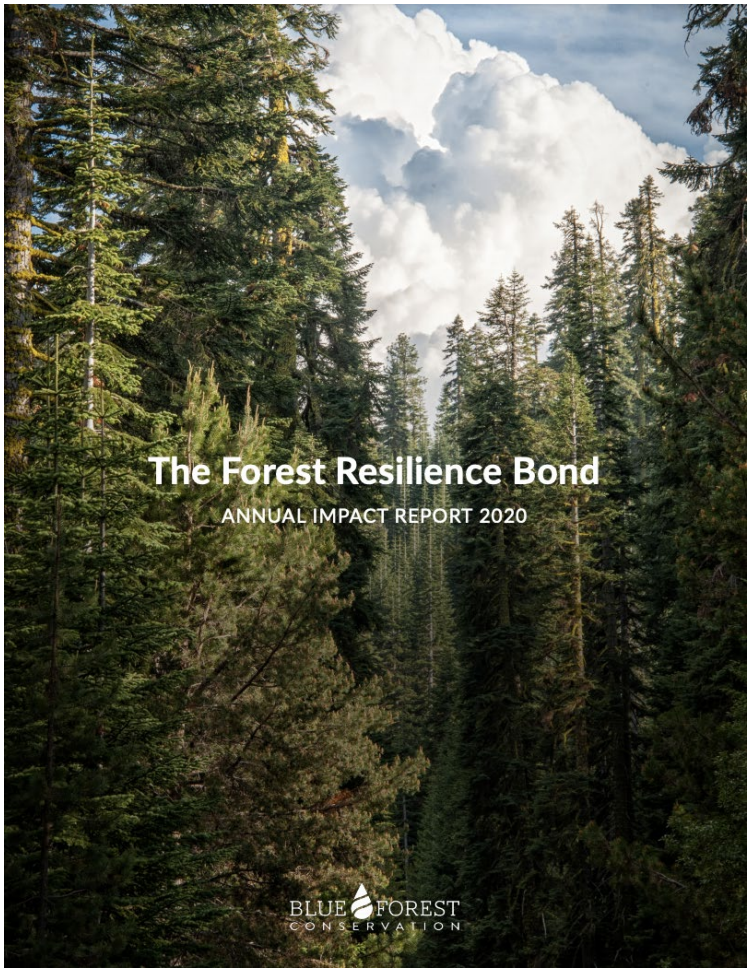
Impact Reporting Aligned with SDGs



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Opportunities for Better Carbon Outcomes

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Biomass Utilization

- 1-2 Million Tons in California
- 6-8 Million Tons in West
- Up to 10x increase

- 2-3 Green Hydrogen plants
- 10-15 25 MW Biopower plants
- 40-60 Biochar Facilities

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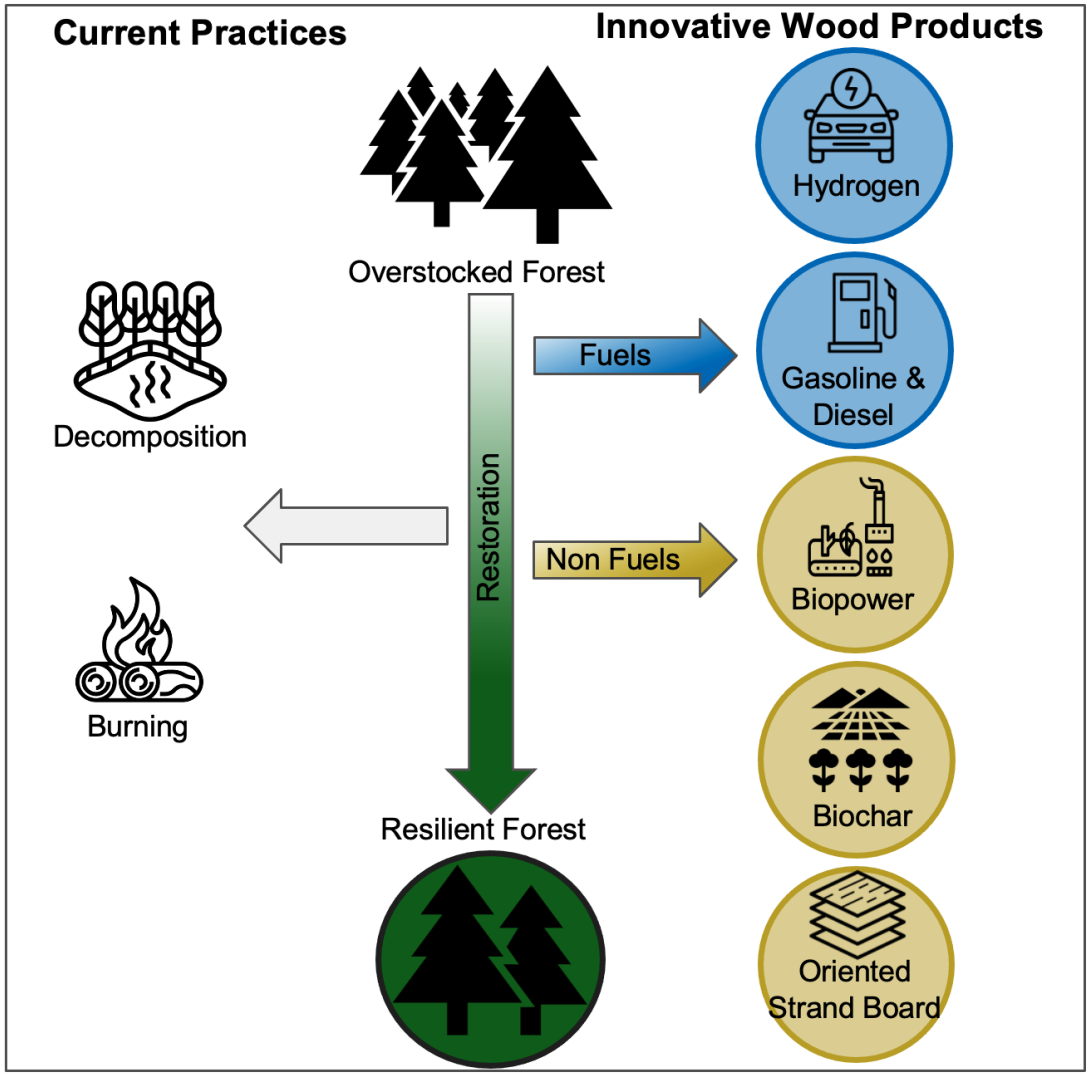
Business Opportunities



Product	CO_2 Benefit/ ton biomass
Biopower	~ 0.2
Biochar	0.4 - 0.7
Gas/ Diesel	0.4 - 0.7
Hydrogen	~1.5
OSB	~2

Carbon Capture and Storage (CCS) can double carbon benefit

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Carbon Income Opportunities

- **Voluntary Carbon Market**

  ~$100 per ton for biochar credits

- **Federal Renewable Fuel Standard**

  ~1 per gallon gas equivalent

- **California Low Carbon Fuel Standard**

  ~$225 per ton CO_2

Leveraging carbon benefits through policy or market mechanisms are necessary for timely scalability

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Thank You

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