



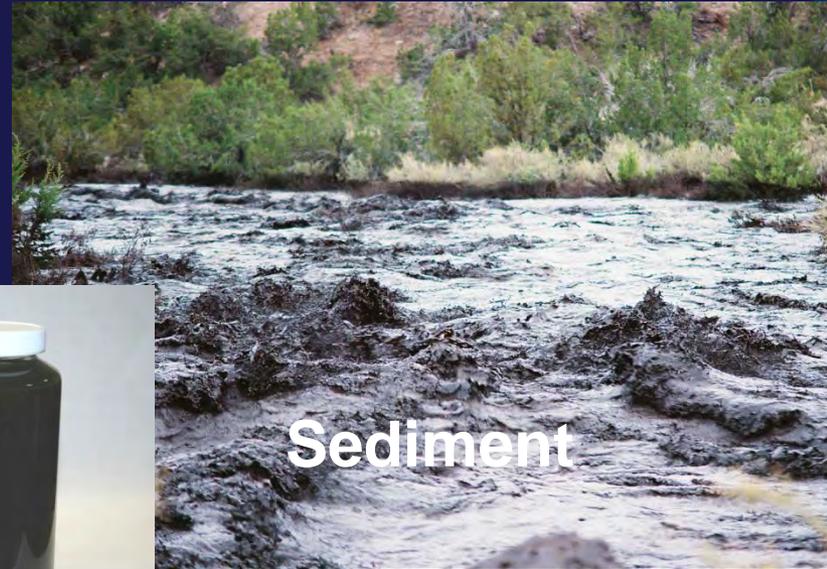
Water Security in New Mexico: Vision for the Middle Rio Grande and Forested Watersheds

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The Threat of Severe Fires



Water Quality





Cochiti Lake after the Fire

- Tons of debris
- Recreation closure
- Poor water quality

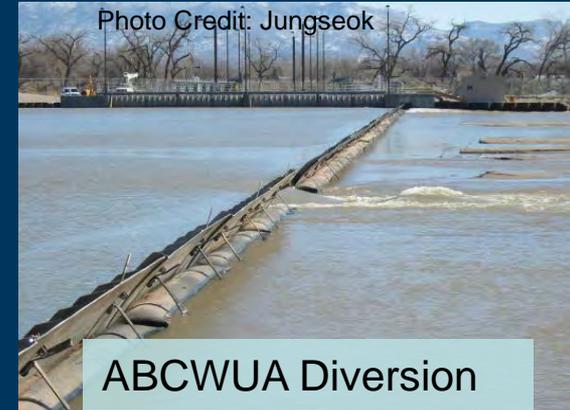
**ABCWUA stopped using
San Juan-Chama water for 40 days;
BDD stopped diversions for over 20 days.**

Rio Grande and San Juan-Chama – Important Community Water Supplies

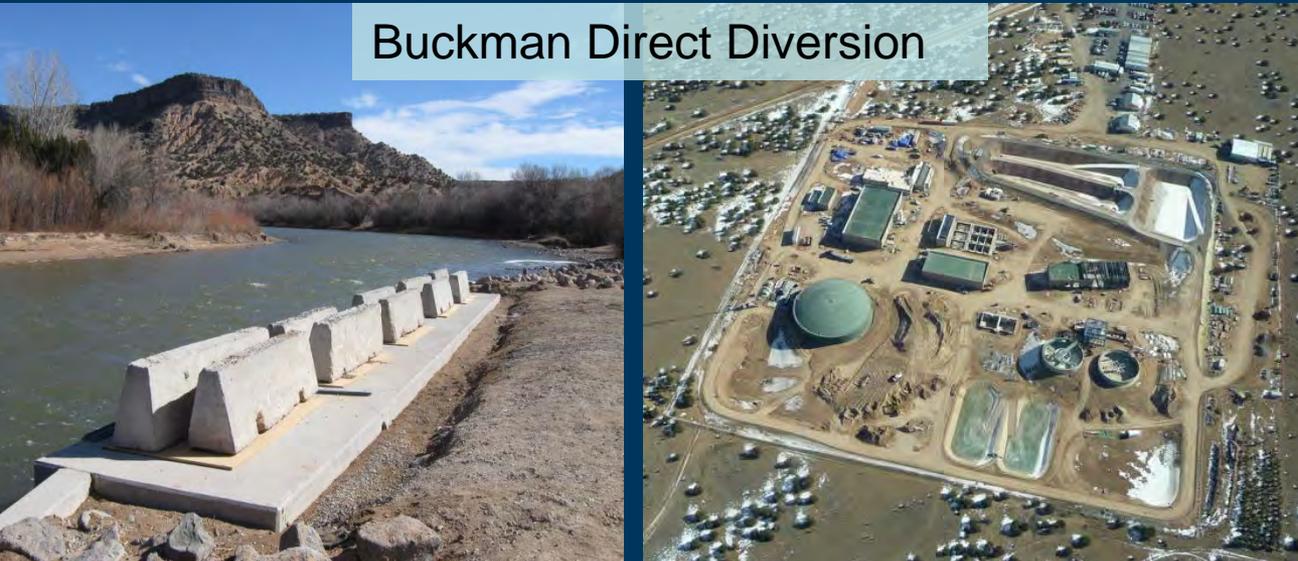
Photo Credit: Rip Trangle



Photo Credit: Jungseok



Buckman Direct Diversion



Proactive strategies



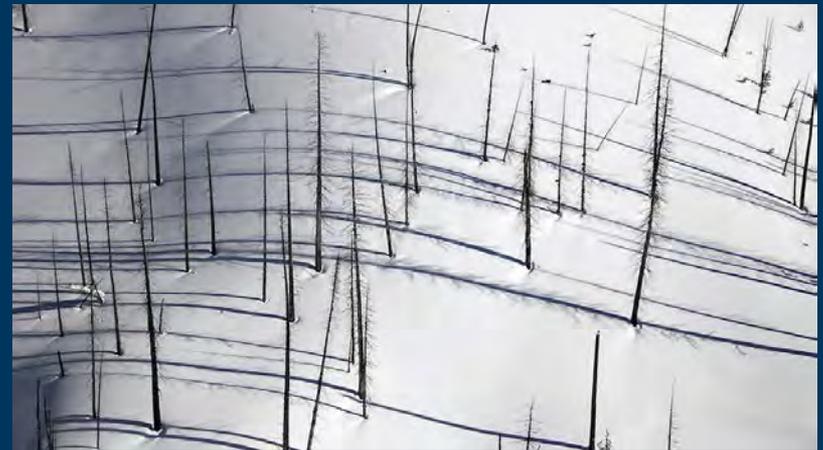
1. Forest treatments (thinning and RX burn)
2. Stream restoration
3. Flood mitigation



Forest Treatments Can Enhance Snowpack



- **Thinning can reduce snow sublimation by up to 50% (Veatch et al. 2009)**
- **Winter ablation in burned areas reduces snowpack by 50% (Harpold et al. 2013)**



BUT how can we get the needed forest work done in a time of limited budgets?

There are Solutions

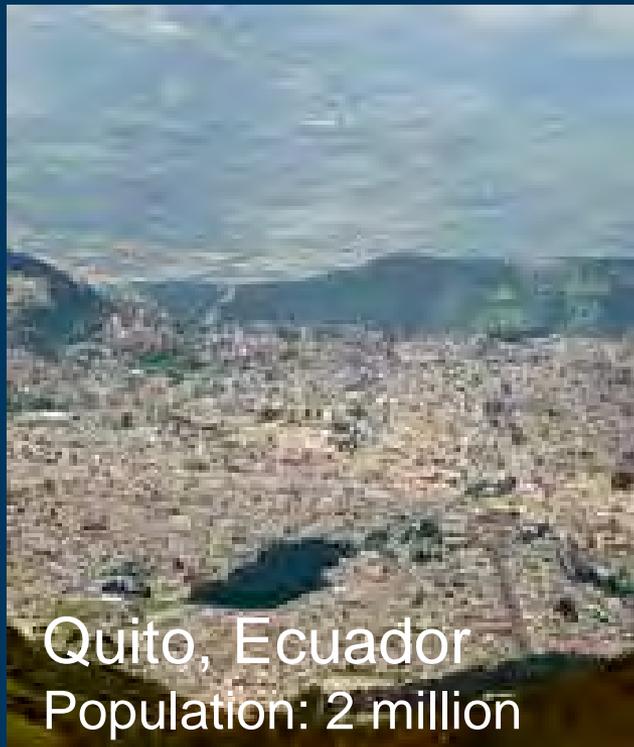


Latin America Water Funds



Innovation in Quito, Ecuador

Users



Providers



Water Fund

Board

Financial
Fund

\$

\$

CLEAN
WATER



Water Funds as September 2012

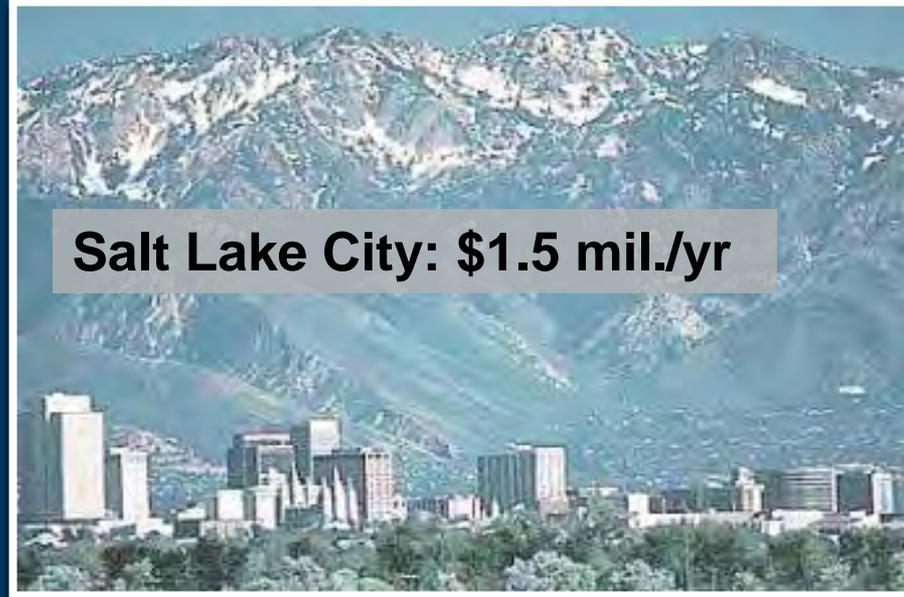
WF by stage



- 1. Evaluate potential
- 2. In Design
- 3. Created & Operating
- 4. Mature

Stage	WF Name	Country
1. Evaluate potential	MINAS GERAIS PES STATE PROGRAM	BRAZIL
1. Evaluate potential	SAO PAULO STATE PES PROGRAM	BRAZIL
1. Evaluate potential	RIO DE JANEIRO PES STATE PROGRAM	BRAZIL
1. Evaluate potential	LA PAZ WATER FUND	BOLIVIA
1. Evaluate potential	SANTIAGO VALPARAISO WATER FUND	CHILE
1. Evaluate potential	SAO LOURENCO WATERSHED PANTANAL	BRAZIL
1. Evaluate potential	AREQUIPA WATER FUND	PERU
1. Evaluate potential	TRUJILLO WATER FUND	PERU
1. Evaluate potential	SIERRA NEVADA WATERFUND	COLOMBIA
1. Evaluate potential	TEGUICOGALPA WATER FUND	HONDURAS
1. Evaluate potential	BARRAQUILLA WATER FUND	COLOMBIA
1. Evaluate potential	MERIDA WATER FUND	VENEZUELA
1. Evaluate potential	CALI WATER FUND	COLOMBIA
1. Evaluate potential	SANTA CATARINA STATE PES PROGRAM	BRAZIL
1. Evaluate potential	CANAL DE PANAMA WATER FUND	PANAMA
2. In design	PARAIBA DO SUL WATERSHED	BRAZIL
2. In design	TAQUARUSU WATERSHED PALMAS	BRAZIL
2. In design	CAMBORIU WATERSHED	BRAZIL
2. In design	CARTAGENA WATER FUND	COLOMBIA
2. In design	MEDELLIN WATER FUND	COLOMBIA
2. In design	MONTERREY WATER FUND	MEXICO
2. In design	AYAMPE PUERTO LOPEZ	ECUADOR
2. In design	UPPER TIETE WATERSHED SAO PAULO	BRAZIL
2. In design	CANCUN, QUINTANA ROO WATER FUND	MEXICO
2. In design	SIXAOLA WATER FUND	PANAMA
2. In design	FONCAGUA GUATEMALA CITY	GUATEMALA
2. In design	PIURA WATER FUND	PERU
2. In design	GUAYAS GUAY AQUIL	ECUADOR
2. In design	TERRABA WATER FUND	COSTA RICA
2. In design	SANTO DOMINGO WATER FUND	DOMINICAN REPUBLIC
2. In design	RIO Y AQUE DEL NORTE WATER FUND	DOMINICAN REPUBLIC
3. Created and operating	ESPIRITO SANTO PES STATE PROGRAM	BRAZIL
3. Created and operating	PROCUENCAS ZAMORA	ECUADOR
3. Created and operating	TUNGURAHUA AMBATO	ECUADOR
3. Created and operating	AGUA SOMOS	COLOMBIA
3. Created and operating	FONAPA CUENCA AZOGUES	ECUADOR
3. Created and operating	AGUA POR LA VIDA Y LA SOSTENIBILIDAD	COLOMBIA
3. Created and operating	AQUAFONDO	PERU
3. Created and operating	GUANDU WATERSHED RIO DE JANEIRO	BRAZIL
3. Created and operating	PCJ WATERSHED CANTAREIRA SYSTEM SAO PAULO	BRAZIL
3. Created and operating	PIRIPAU WATERSHED BRASILIA	BRAZIL
3. Created and operating	SEMILLA DE AGUA	MEXICO
4. Mature	FONAG QUITO	ECUADOR

Existing Watershed Investments



Water Fund Vision and Goal

Vision: Reliable supply of high-quality Rio Grande water and healthy forests for the benefit of New Mexico's communities.

Goal: To protect storage, delivery and quality of Rio Grande water through landscape-scale forest restoration treatments in tributary forested watersheds, including headwaters of the San Juan Chama Project.

Objectives

1. Reduce forest fuels in areas identified as high-risk for wildfire and debris flow.
2. Maintain the reduced wildfire hazard in treated areas.
3. Mitigate the downstream effects of wildfires.
4. Secure sustainable financing from water users, government, investors and donors, and facilitate payments to upstream land managers to help them reduce wildfire and debris flow risk in high priority areas and maintain those areas long-term.

Large Scale Needed

6,000  30,000
acres/year

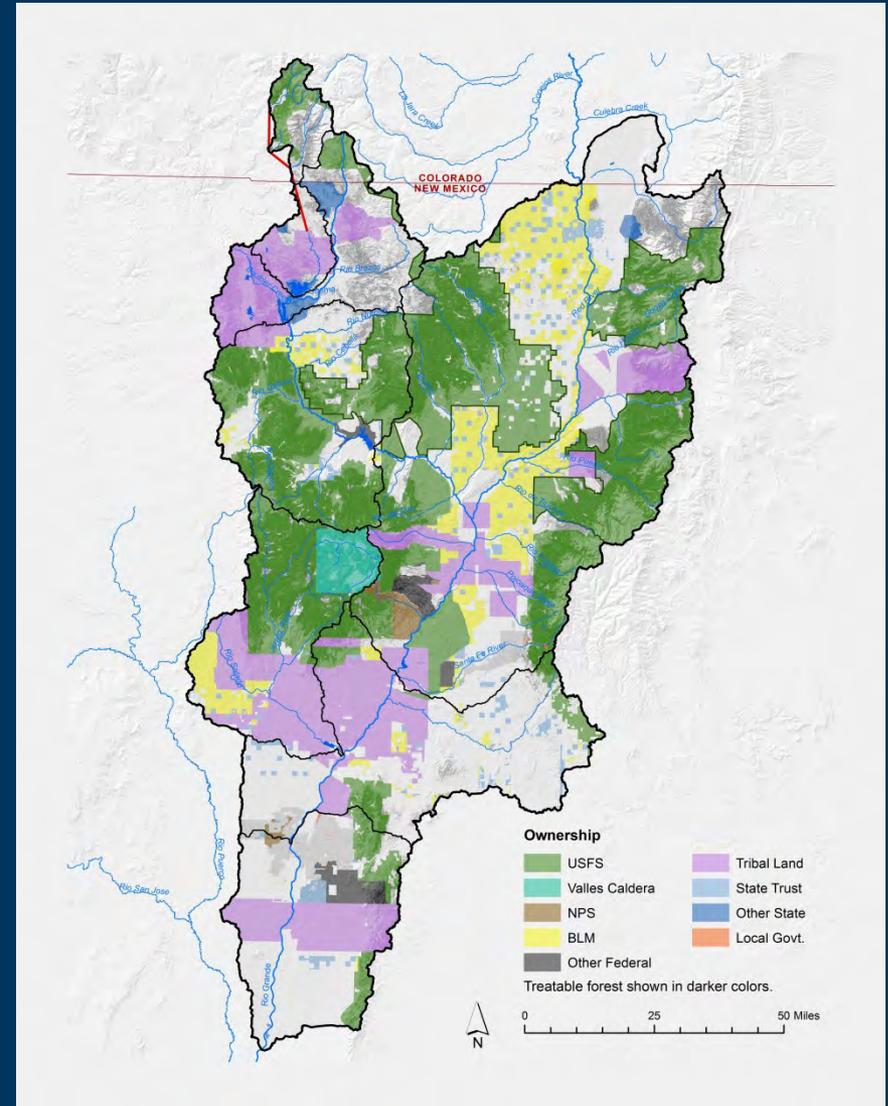
Tentative Goals:

1.7 million acres of
resilient forest/streams

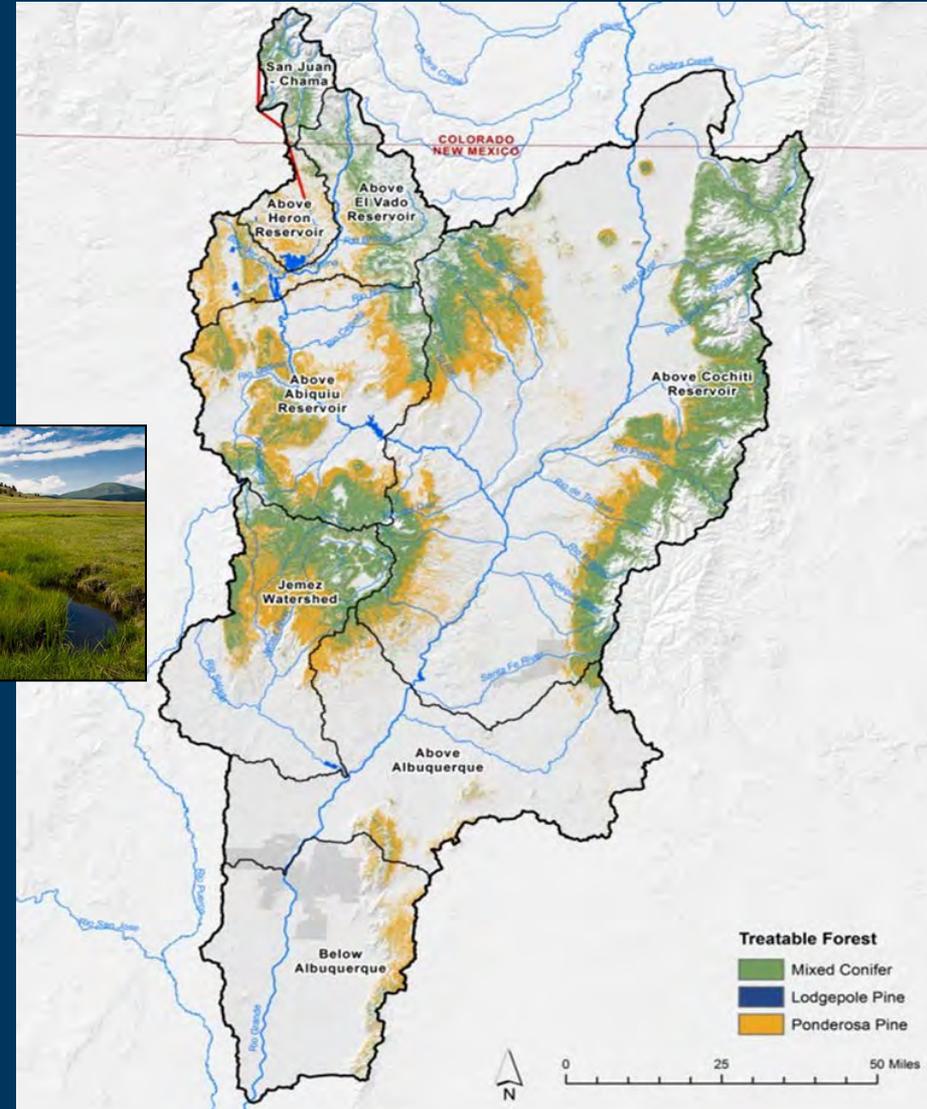
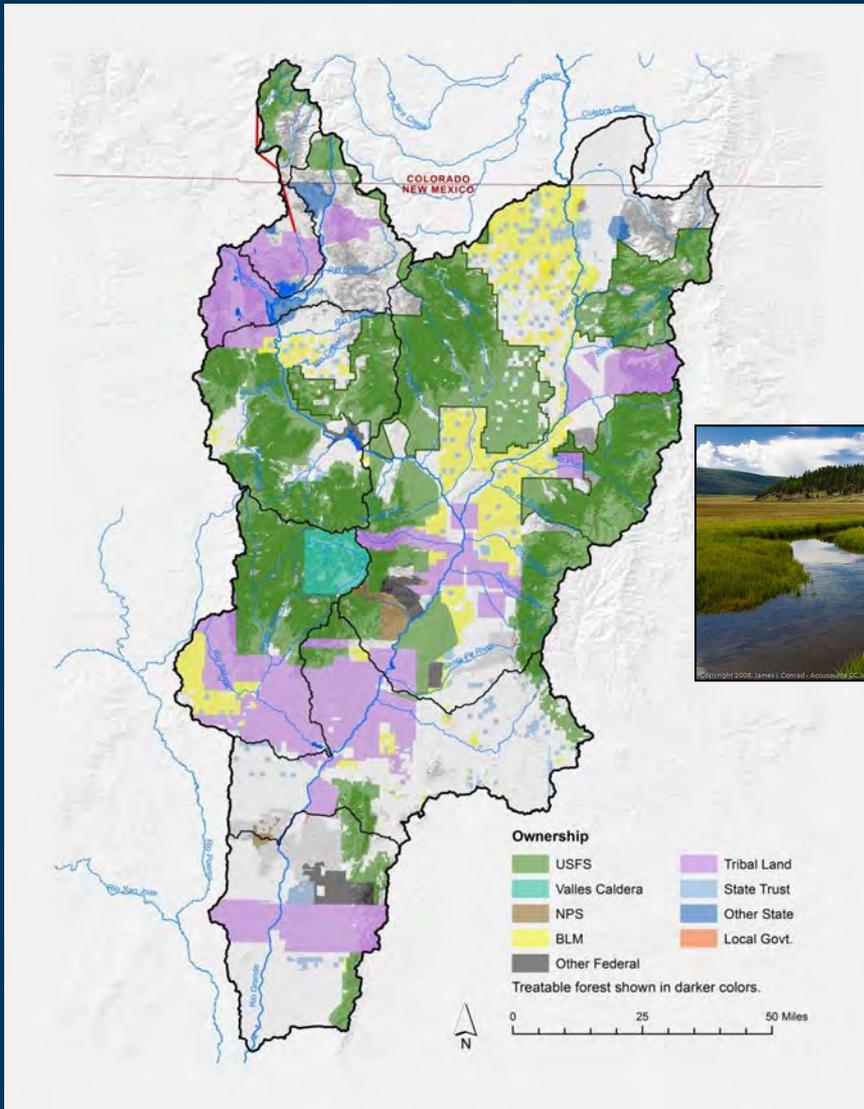
700,000 acres treated

30 years

\$7-15 million year



Forests Needing Restoration



New Alliances for Water Security

Albuquerque
Bernalillo County
Water Utility Authority
& Buckman Direct
Diversion Project

Federal
agencies
USFS
USACE
USGS
BOR
VCNP

State water
agencies ISC,
OSE, NMED

NM Dept. of
Insurance

State forest/watershed
agencies, NMAD
EMNRD/Forestry

NM:
WNR
LFC
PRC

City Councils, County
Commissioners, NM
Association of Counties

NM Acequia Association

Middle Rio
Grande
Conservancy
and agricultural
users

Pueblos

Business:
GACOC,
ACI,
NMWBTF,
SFCOC,
NAIOP

Conservation Groups
Recreation Users

Sandia & LANL

Corporations with
Sustainability Programs
Lowe's, Intel, General
Mills etc.

UNM
EPSCoR
NMSU
NMHU

NM
Forest
Industry
Association

Water Fund Development

1. Advisory Board for guiding program development;
2. Working Groups conducting studies to inform treatment priorities and understand economics:
 - Debris-Flow
 - Water Yield
 - Flood Mitigation
 - Monitoring
 - Wood Supply and Investment
 - Forest Operations
 - Structure and Governance
 - Business Council
 - Education and Outreach
3. Comprehensive Plan for forests and streams
4. Implementation

Coordinated, Leveraged, Multi-source Funding Solution

1. Federal appropriations
2. Water Fund
3. Local/municipal/tribal matching
4. Investment in wood-processing infrastructure



Water Fund Financial Supporters



**WELLS
FARGO**



**NM Watershed and
Dam Owners Coalition**

**Hancock
Family
Foundation**

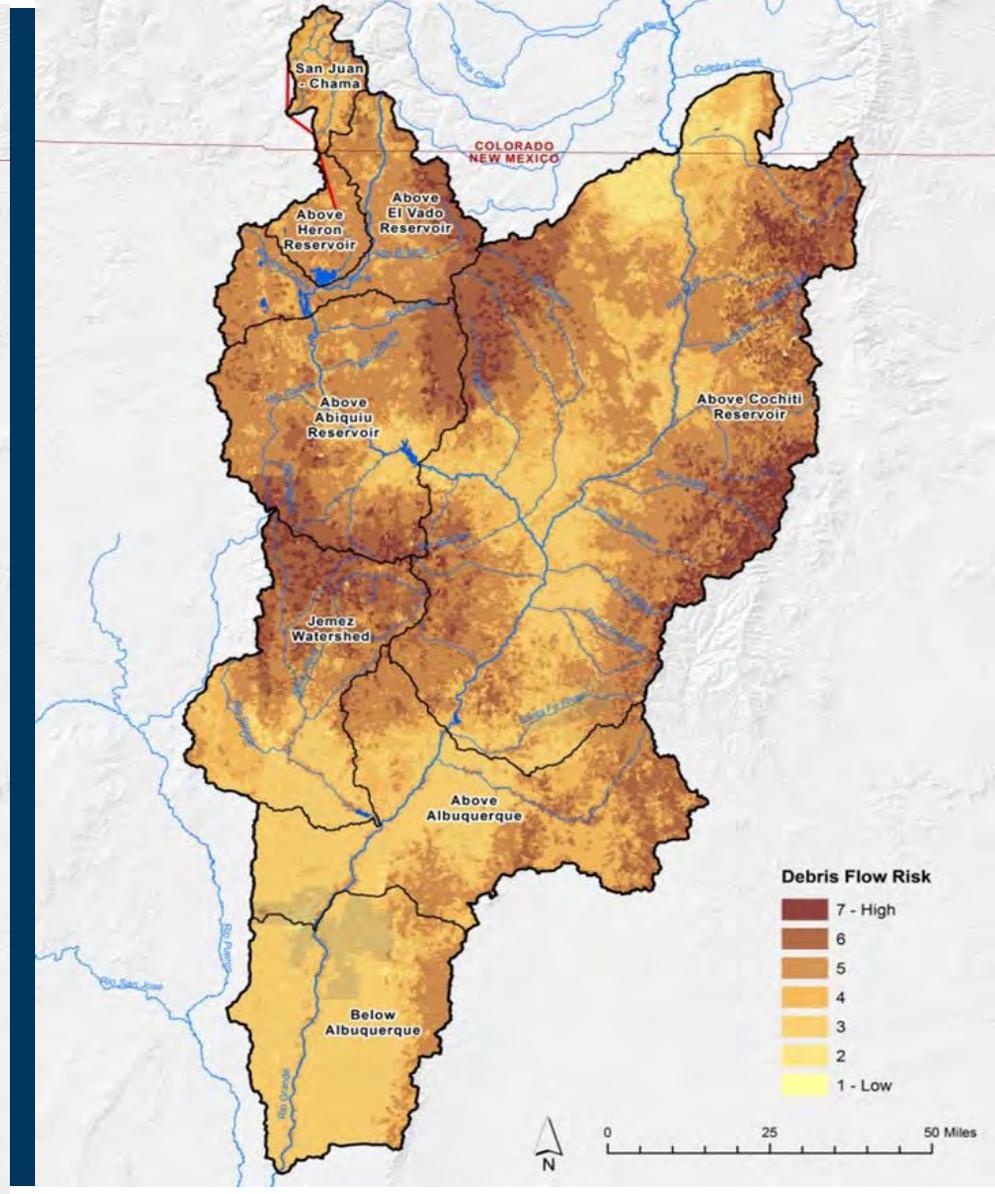
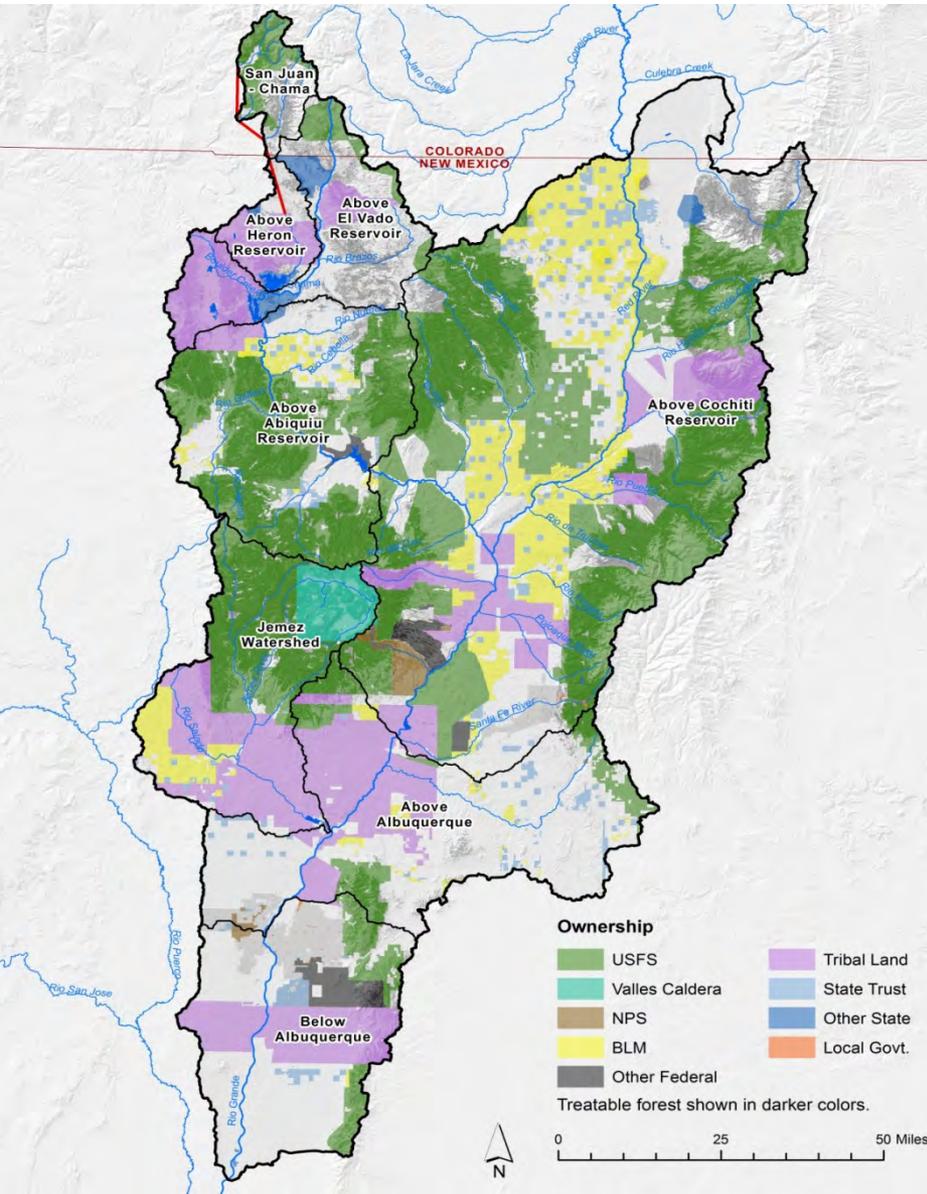
Thank you!

Watershed Studies

- Identify highest risk forests and streams
- Determine extent of treatment needs
- Model the effects on water
- Estimate avoided costs



Ownership and Probability of Fire and Debris Flow



STUDY FUNDERS

Interstate Stream Commission

Bureau of Reclamation through the Southern Rockies
Landscape Conservation Cooperative

Santa Fe National Forest

Cibola National Forest

Santa Fe County

Buckman Direct Diversion Project

NM Dept Game and Fish

Albuquerque Bernalillo County Water Utility Authority

U.S. Geological Survey

Bernalillo County

NM EPSCoR and University of New Mexico

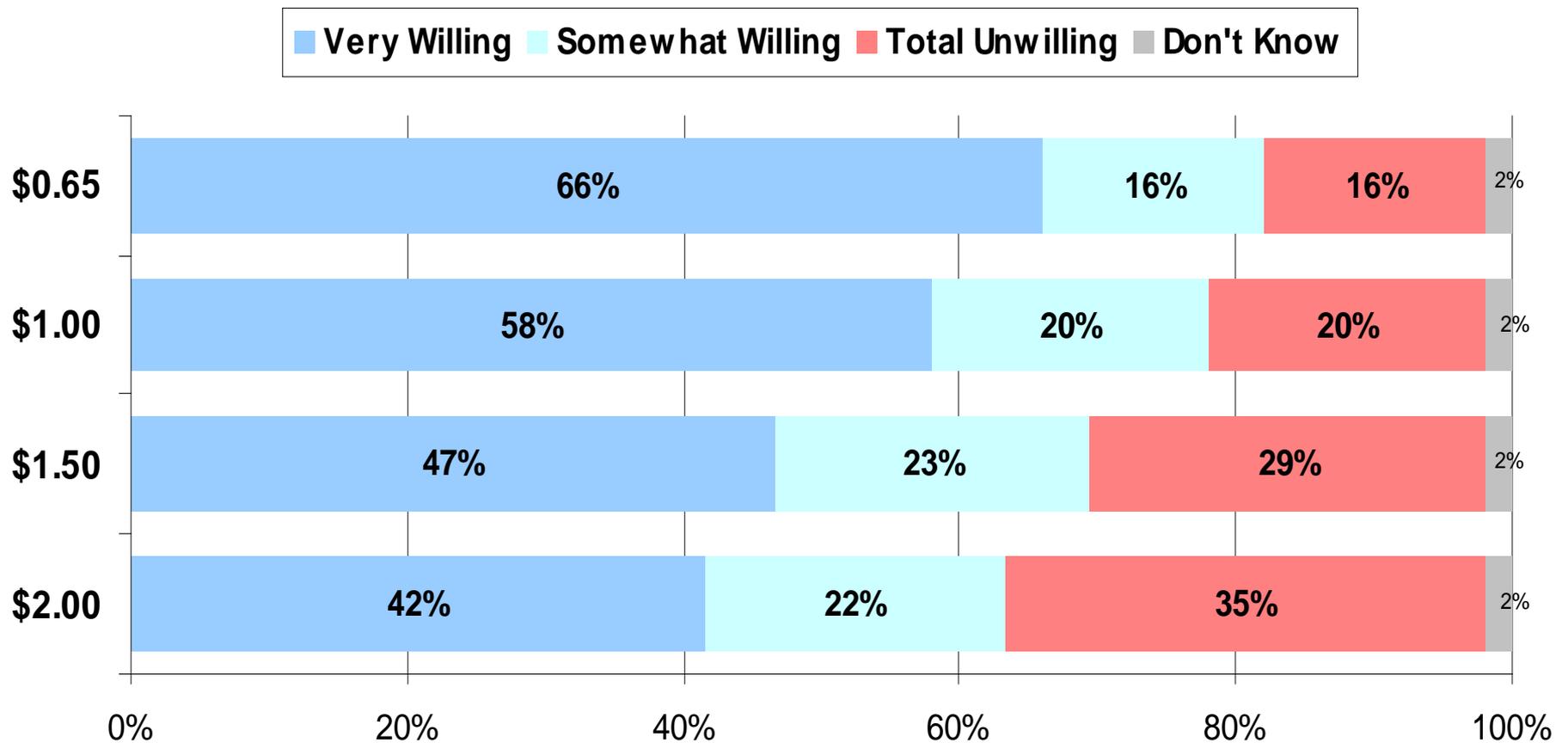
Thank you!

A man wearing a camouflage cap, sunglasses, a blue t-shirt, and jeans is sitting in a black folding chair on a sandy bank. He is fishing with two rods. A large log lies on the ground next to him. In the background, a river flows through a dam structure, with mountains under a blue sky with light clouds.

Thanks!

Public Opinion Research, Santa Fe in 2011

Willingness to pay a monthly fee



Scale up to
30,000 ac/yr
for 10-30 years
in Rio Grande
and Rio Chama
forested
watersheds

