



WORLD
RESOURCES
INSTITUTE

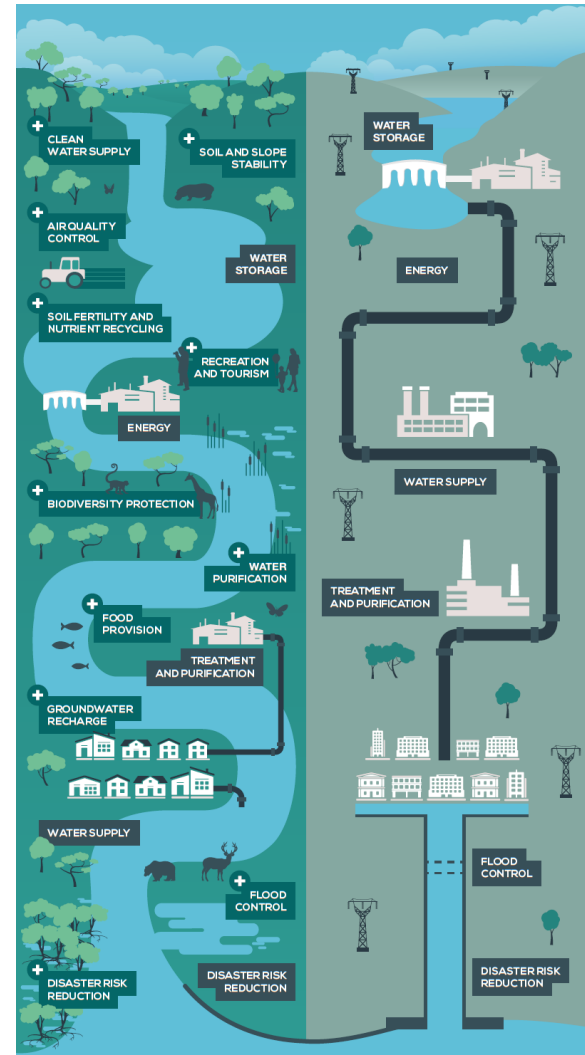
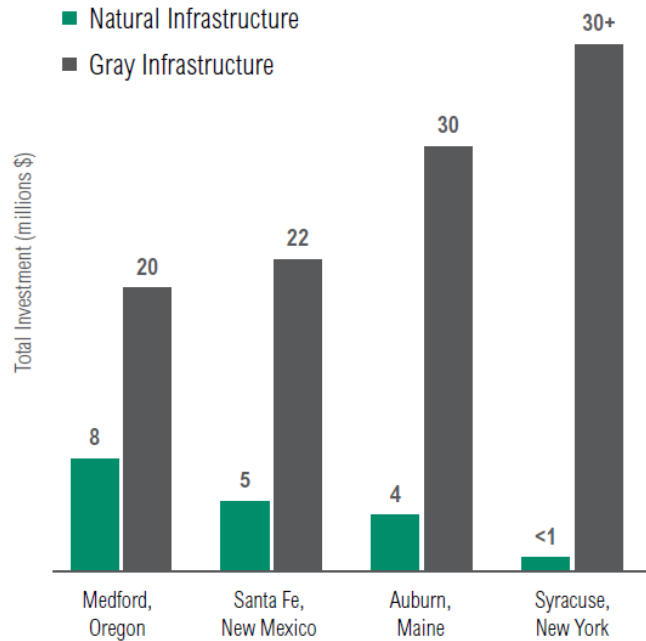
Natural Infrastructure Investments: Financing Smart Solutions to Meet Water & SDG Priorities

Todd Gartner | Senior Associate, WRI

WWW, Stockholm | August 29, 2017

WHY GREEN + GRAY?

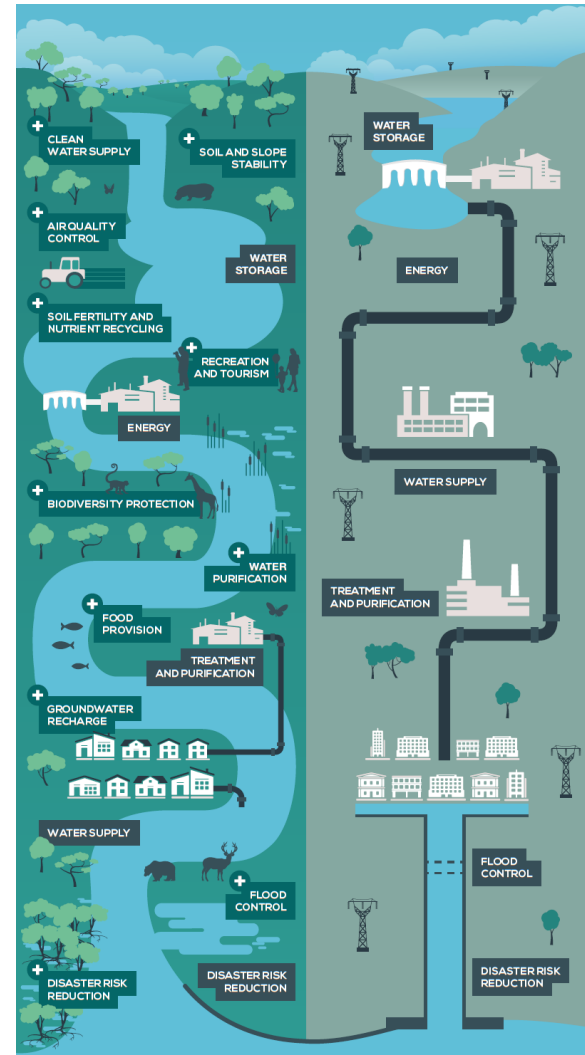
Reduce capital expenses and treatment costs



Source: IUCN 2015

WHY GREEN + GRAY?

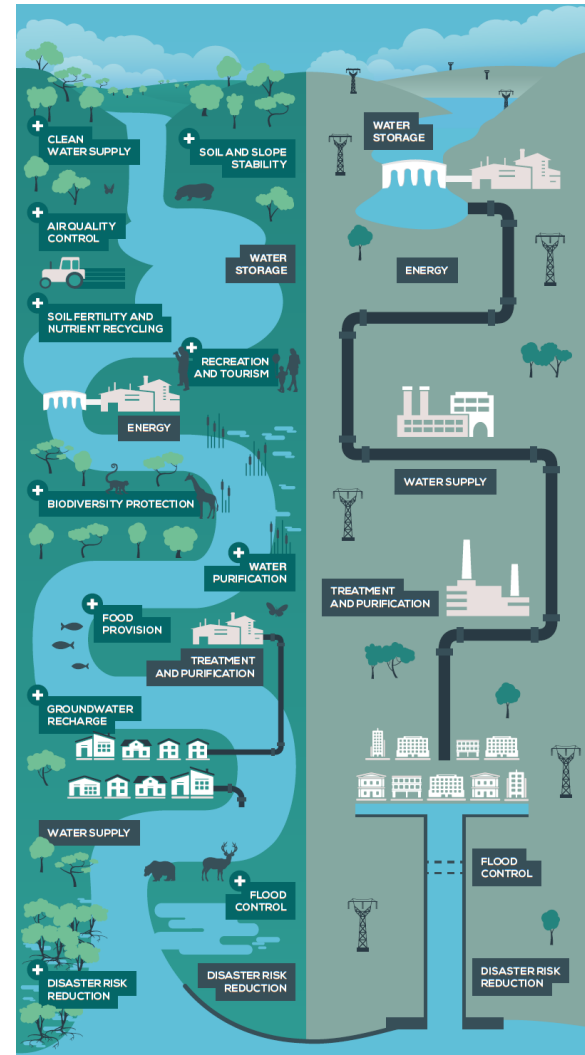
Improve climate resilience & business flexibility



Source: IUCN 2015, App Developer

WHY GREEN + GRAY?

Meet SDG, urban-rural development and water stewardship goals



Source: IUCN 2015

Catastrophic Events Pipeline of Investable Projects



KNOW YOUR WATERSHED (1)

- Wetlands and Waterbodies
- Tree cover
(year 2000, 30m global, Hansen/UMD/Google/USGS/NASA)
- Land cover
- Major dams
- Urban water intakes
 - River
 - Lake
 - Reservoir
 - Groundwater

IDENTIFY WATERSHED RISKS (2)

- Tree cover loss
(annual, 30m, global, Hansen/UMD/Google/USGS/NASA)
2001 to 2014
Displaying > 30% canopy density.
- Tree cover gain
(12 years, 30m, global, Hansen/UMD/Google/USGS/NASA)
- Potential forest coverage
- Active fires
(daily, 1km, global, NASA)
- Erosion
- Arid
- Baseline water stress

PLAN FOR ACTION (0)

- Case Studies
- Beyond the Numbers

Know Your Watershed

visualize critical watershed related information

Identify Watershed Risks

understand type and severity of threats to watershed health

Plan for Action

obtain recommendation on natural infrastructure solutions and applicable guidelines and decision-support tools

Search by river, watershed, or city

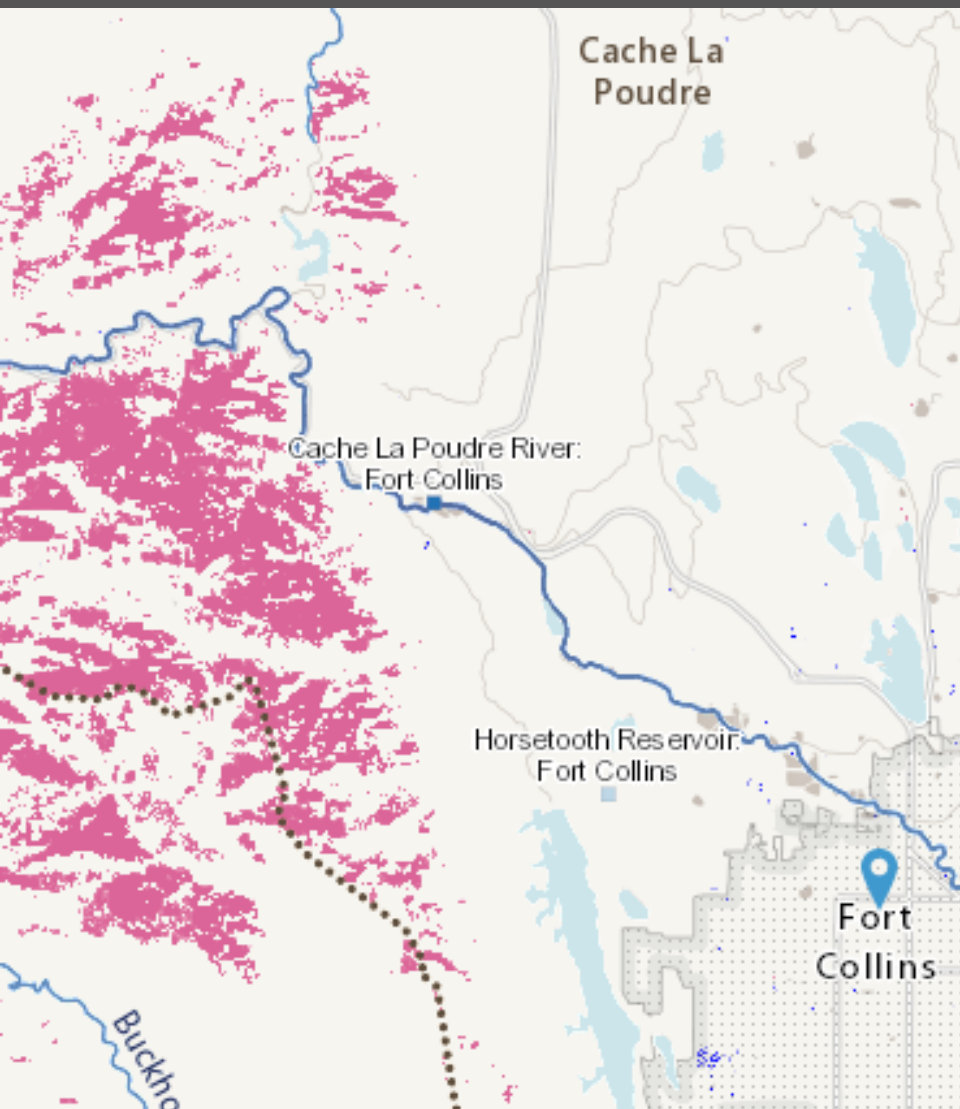
Analyze Watershed

Current Watershed Custom Analysis

To analyze, use the search bar to find your watershed or click on your watershed via the map.

FEEDBACK





▼ Search by river, watershed, or city 🔍

[Analyze Watershed ?](#)

Current Watershed

Custom Analysis

Create sub-watershed from a point ⓘ

Add point

or
Enter latitude & longitude

38.32

-77.89

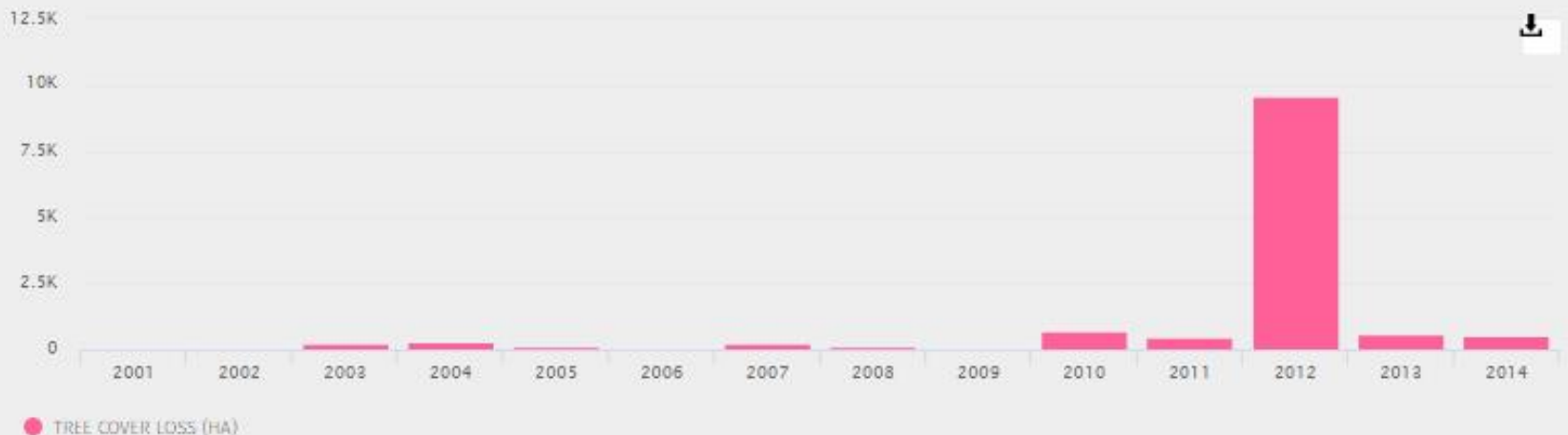
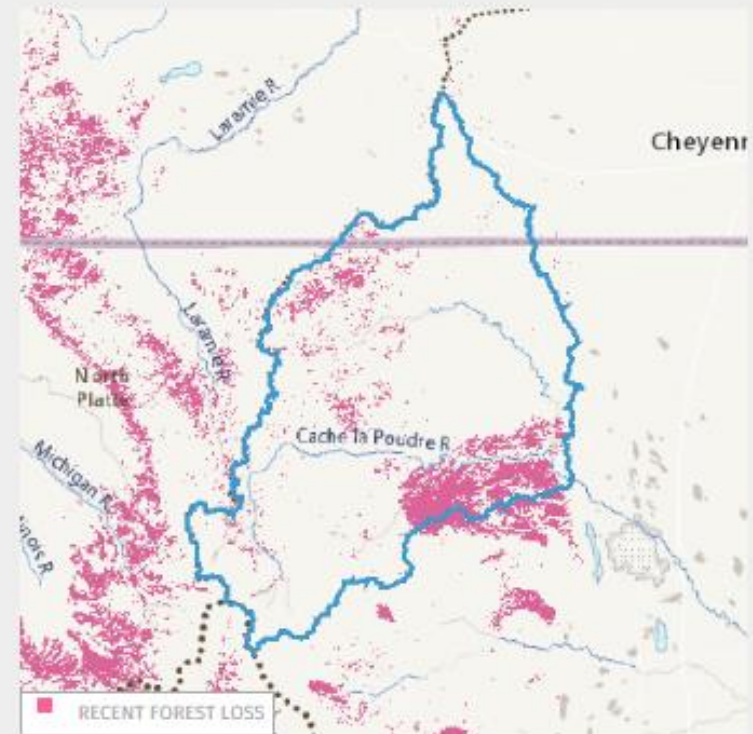
Go

RECENT FOREST LOSS RISK SCORE: 5/5

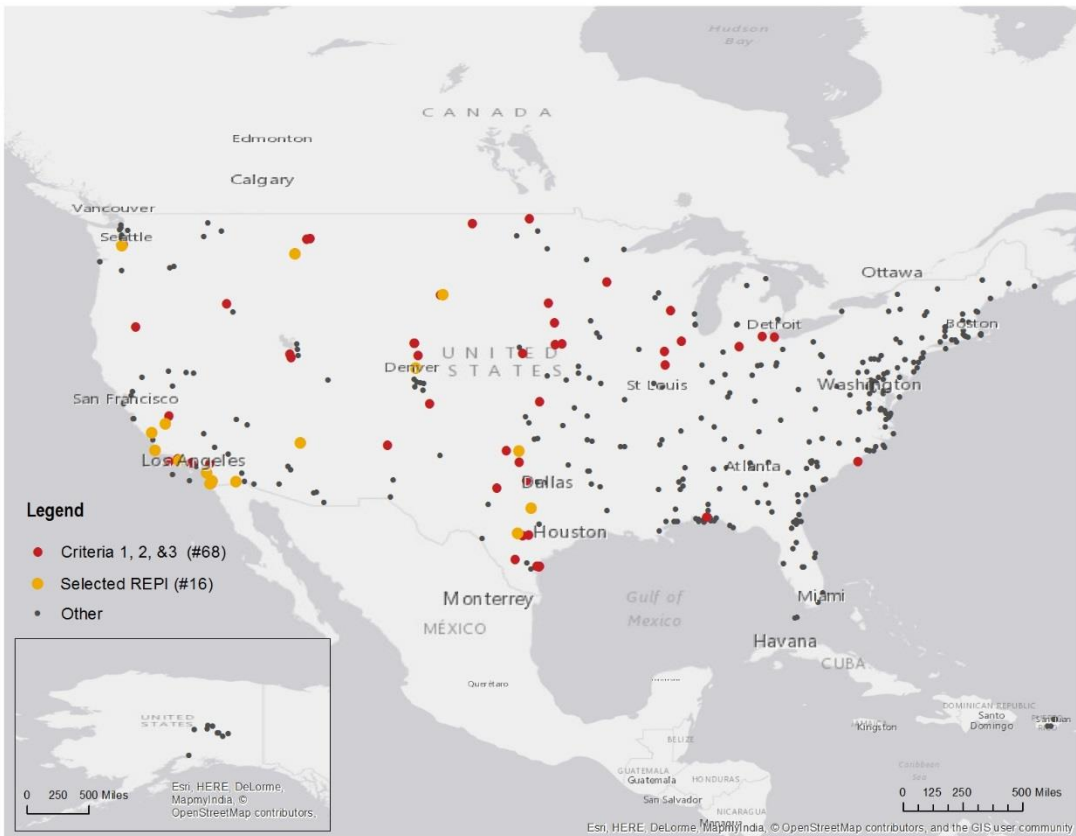
This watershed experienced 12,902 Ha of tree cover loss from 2001 to 2014, accounting for 10.73% of total tree cover (2000), presenting a **positive** trend.

Recent forest loss risk was measured by the area of total forest loss from 2001 to 2014 as a share of total forest extent (year 2000). The threshold of canopy density for identifying forest and forest loss is set to **> 30** across the globe, which may include natural forest, plantations and other forms of vegetation depending on the region. This risk score is not applicable to arid areas and areas where total forest extent (year 2000) is less than 10% of watershed.

Recent forest loss estimates the potential of damaging impact from recent changes (2001 – 2014) in the extent of forest cover in a watershed. As forests are converted to other land uses or are unnaturally disturbed, their ability to regulate flow and purify water diminishes, putting communities at risk of flood, drought, higher cost of treatment, and greater incidence of drinking water contamination. In addition to the area of forest removed, the duration and magnitude of a watershed's response depends on various factors, including age and type of forest removed, climate, topography, and size of the watershed.



U.S. DOD Installation Water/Watershed Risk Prioritization



THE
SCHERMAN
FOUNDATION

**GLOBAL
FOREST
WATCH
WATER**

BETA

U.S. DOD Installation Multi-Benefit Approach

**Mission
Readiness**



**Water
Security**



**Habitat
Protection**



**Compatible
Land Use**



2017 on Pace for Worst US Fire Season on Record



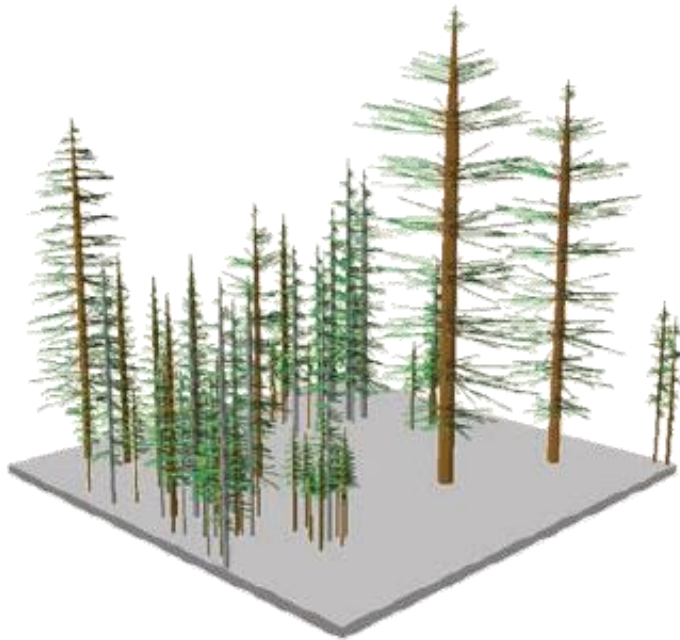
Source: US Forest Service Photo Credit: Jim; The Oil Drum

Western Forests in Crisis

PROBLEM: OVERGROWN FORESTS

- Overgrowth intensifies drought and wildfire
- Water quality threatened
- Hydropower generation severely affected
- US Forest Service facing rising suppression costs

1929



Today

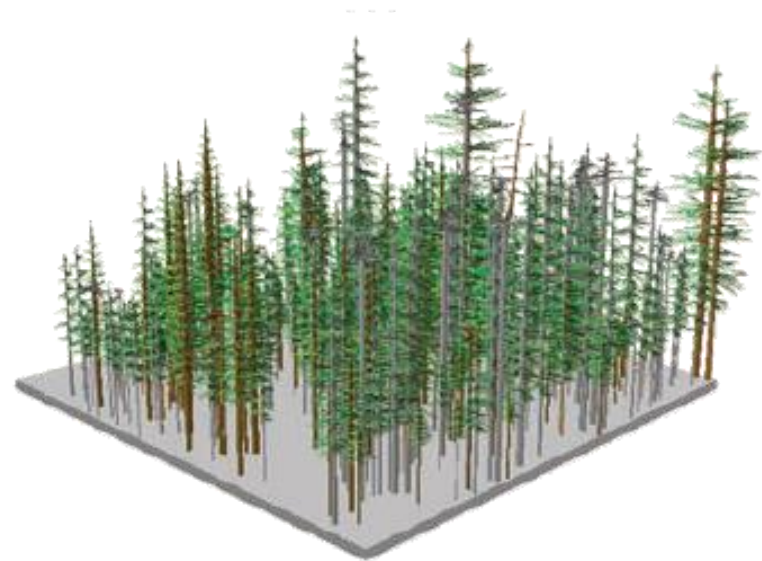
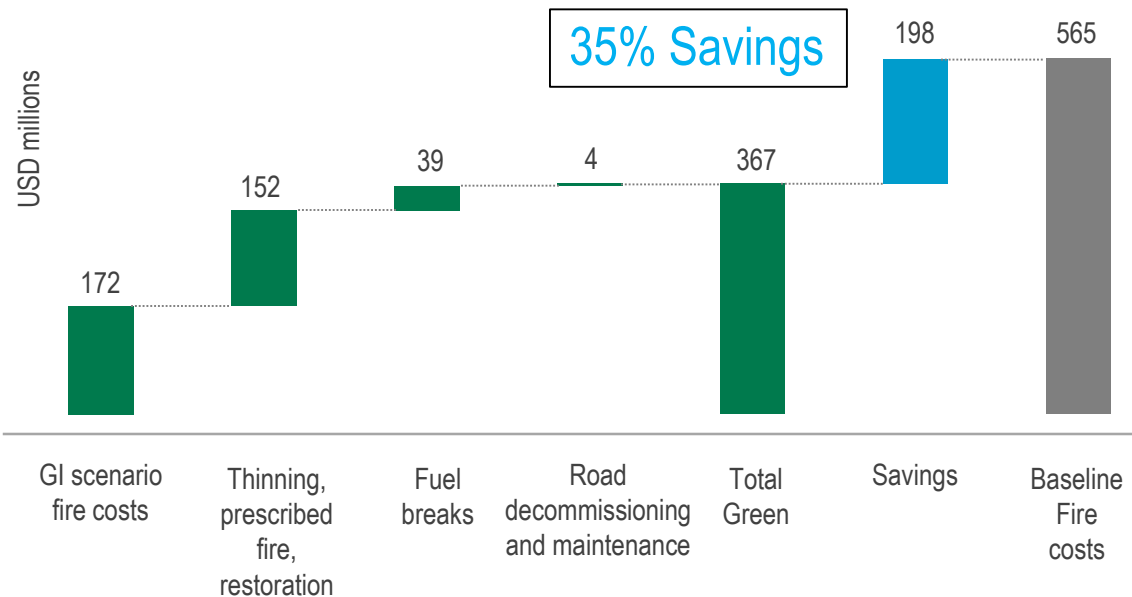


Photo Credit: US Forest Service, Viewing Forests Through a Historical Lens, Fall 2009

The Business Case: Northern Front Range, CO

Preliminary summary financials for natural infrastructure Approaches for managing fire risks in Northern Front Range, CO

Present value of investments over 20 years, Base Case Scenario

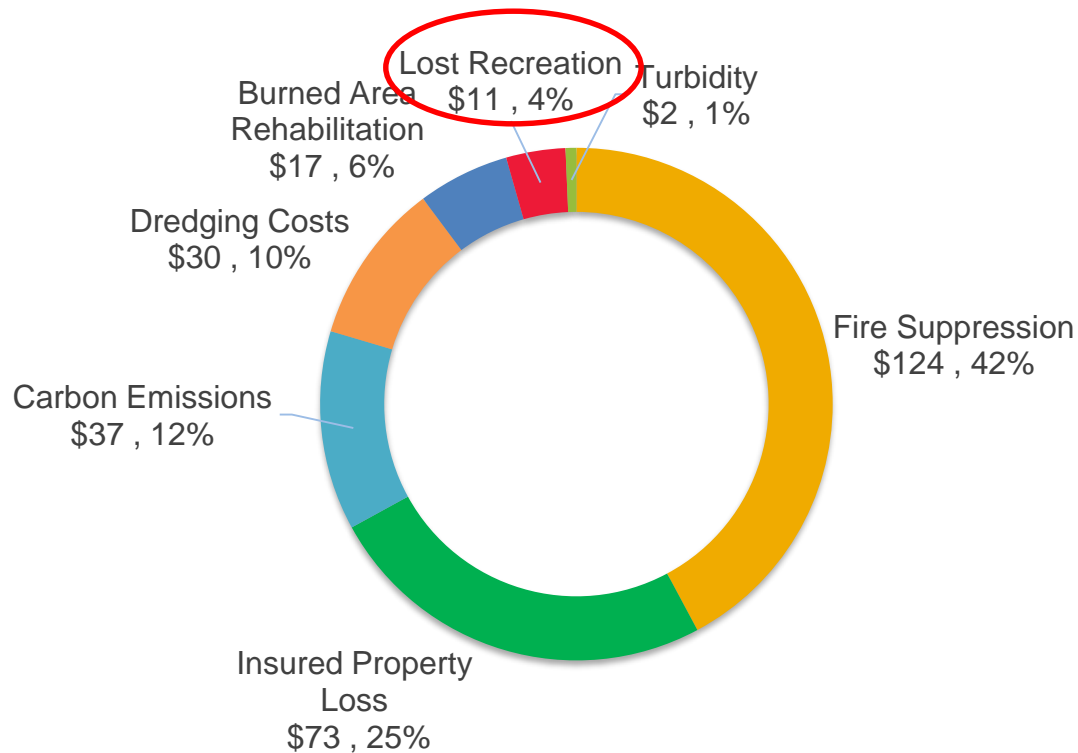


Source: Talberth, J. et al. 2014. Analysis of the Cache la Poudre and Big Thompson Watersheds of Colorado's Front Range – Preliminary Report: WRI and CSE

The Business Case: Northern Front Range, CO

Preliminary summary financials for Northern Front Range, CO Distribution of (real-time) Savings, USD millions

Base Case Scenario



Source: Talberth, J. et al. 2014. Analysis of the Cache la Poudre and Big Thompson Watersheds of Colorado's Front Range – Preliminary Report: WRI and CSE

Recreational Values and Connection to Place



Source: Vail Resorts

Restoration Solution = Jobs in the Forest



1,000 acres (405 ha) = 15 new forest positions & another 30 spin-off jobs

Goal to decrease local unemployment rate 2% over 10 years (450 jobs)

Source: , Community Stewardship Project, 2011; Economic Development Authority Director for Tuolumne County,

Moving from Pilot to Policy - AB 2480



PACIFIC FOREST TRUST

Why Forests Matter What We Do

POLICY

PROMOTING WATER SECURITY, NATURALLY

California's population is projected to hit 50 million by 2050, increasing demand for an already scarce resource—cool, clean water. This increased demand in a warmer and drier state dramatically highlights the critical need to improve the reliability of our primary water supply. To help address this, Pacific Forest Trust is working closely with California

Assemblymember Richard Bloom on his pioneering legislation, AB 2480, which recognizes source watersheds as infrastructure and a critical component of the state's water system. AB 2480 also calls for a prioritized and comprehensive investment plan to restore and conserve key



Green Bonds Are a New Source of Financing for Water Security

Logan Yonavjak June 22, 2016

Topics: [Water](#)

San Francisco Public Utility
Commission - \$350M



In this interview, Todd Gartner, senior associate and natural infrastructure for water manager at World Resources Institute (WRI), provided a high-level perspective on how green bonds can support natural infrastructure for water security.

CFN: Whom do you see as the major players in the space right now with regard to green bonds for natural infrastructure?

Gartner: There have been a lot of enthusiasm and conversation increasingly over the last couple of years with actual issuance in the green-bonds space.

Within the last month, San Francisco issued a bond related to water security. Also, DC has clearly been receiving a lot of attention for its green century bond, even though that bond was primarily focused on built infrastructure. Connecticut and





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