Natural Climate Solutions to Protect and Restore Pacific Salmon (and Build a Resilient Shared Future for All!)

Washington State Salmon Recovery Conference
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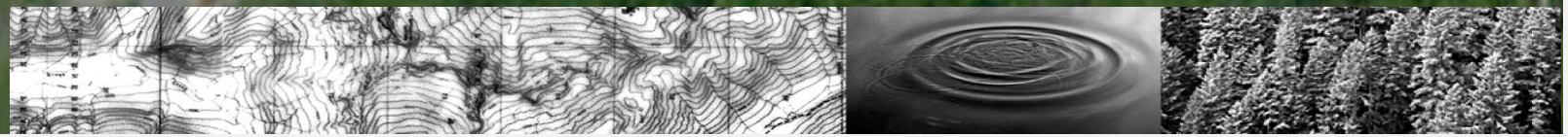
Jill Silver, Executive Director
10,000 Years Institute



About 10KYI

We evaluate the effects of human activities on natural environments – the forests, rivers, wetlands and estuaries that sustain our communities and ecosystems.

Through development of innovative, science-based approaches to restore ecological integrity, we promote sustainable practices in landscapes across the region.

Disturbances = Glacial retreat, extreme rain events, sediment flux and channel migration…

…disturbance encourages **invasive** species…

…and they move from mines to roads to harvest units and river bars, affecting forest growth.

Trees are the answer … to slow climate change …and provide ecosystem services

Clean air and water

Carbon sequestration

Timber and Jobs

Standing dead & down wood

Shade and humidity

Habitats

Soil development

Food and critters

Mycorrhizal fungi

Slope stability

Rivers need resilient forests, too…

Riparian services

Bank stability

Bank protection

Large fallen trees create deep pools and stable log jams

Island development

Food for aquatic bugs

Litterfall

Insect prey

LWD sorts bed materials

Passive restoration tool

Carbon sequestration

Today's presentation:

- Goal: Natural Climate Solutions implemented by a Coastal Conservation Corps (CCC)
- NCS 1: Forest thinning to promote resilience
- NCS 2: Biochar pyrolysis and production
- NCS 3: Scotch broom prevention and control, and soil remediation with biochar
- Funding: 10% of <u>every</u> restoration and construction project to the CCC...plus...

Opportunities and Solutions

Climate Conservation Corps

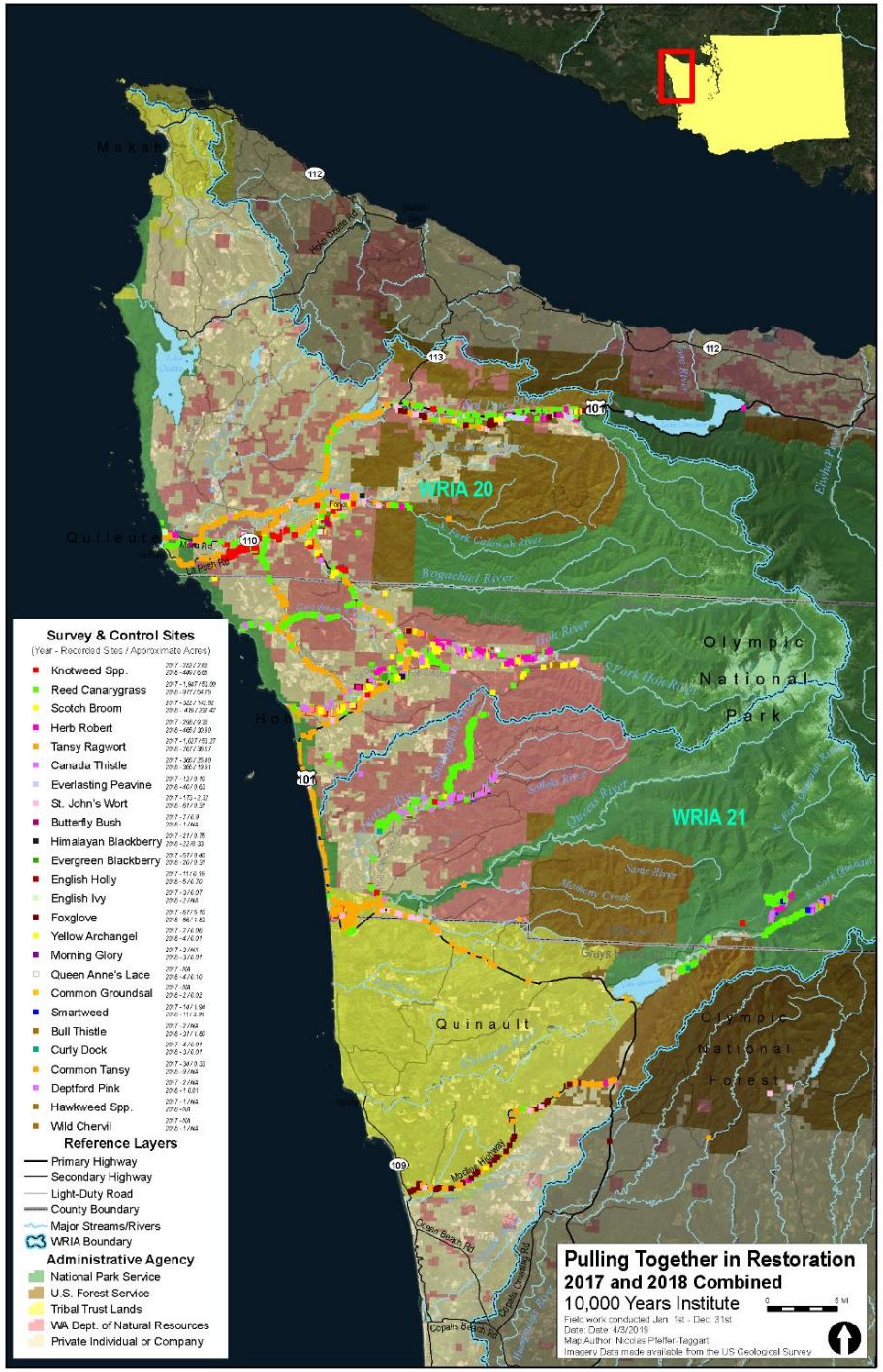
Provides permanent year-round place-based jobs and training

Biomass To Biochar

Coastal/Carbon/Climate Conservation Corps

Permanent place-based conservation corps

Matching local skilled experience with local youth-in-training in work that supports coastal economies.



Pulling Together in Restoration:

Watershed scale, regional approach, & local crews
Pilot for a Place-based Conservation Corps

Funded by the Washington Coast Restoration and Resiliency Initiative

- Focus on Sources, Vectors, and Pathways
- Extensive partnerships, building regional capacity
- Repeated cross-boundary surveys and rapid response to each plant found – roads and streams, forestland, pastures, municipal, residential, restoration project sites
- Developing and demonstrating best management practices, tracking and reporting costs and benefits
- Catching each new species before they spread
- Training local eyes, hands, and spreading the word through communities.

Climate Conservation Corps Provisional Budget – Per Year

Staff		Equipment		Vehicles		Housing
Crew *120 @ $35/hour*	$8,400,000	Forest	$15,000	Trucks *30 @ $28K*	$840,000	?
Supervisors *10 @ $45/hour*	$900,000	Invasives	$10,000	Boats	?	
Trainers *10 @ $60/hour*	$300,000	Roads/Trails	$ 5,000			
Subtotal	$9,600,000		$30,000		$840,000	

Total: $10,470,000

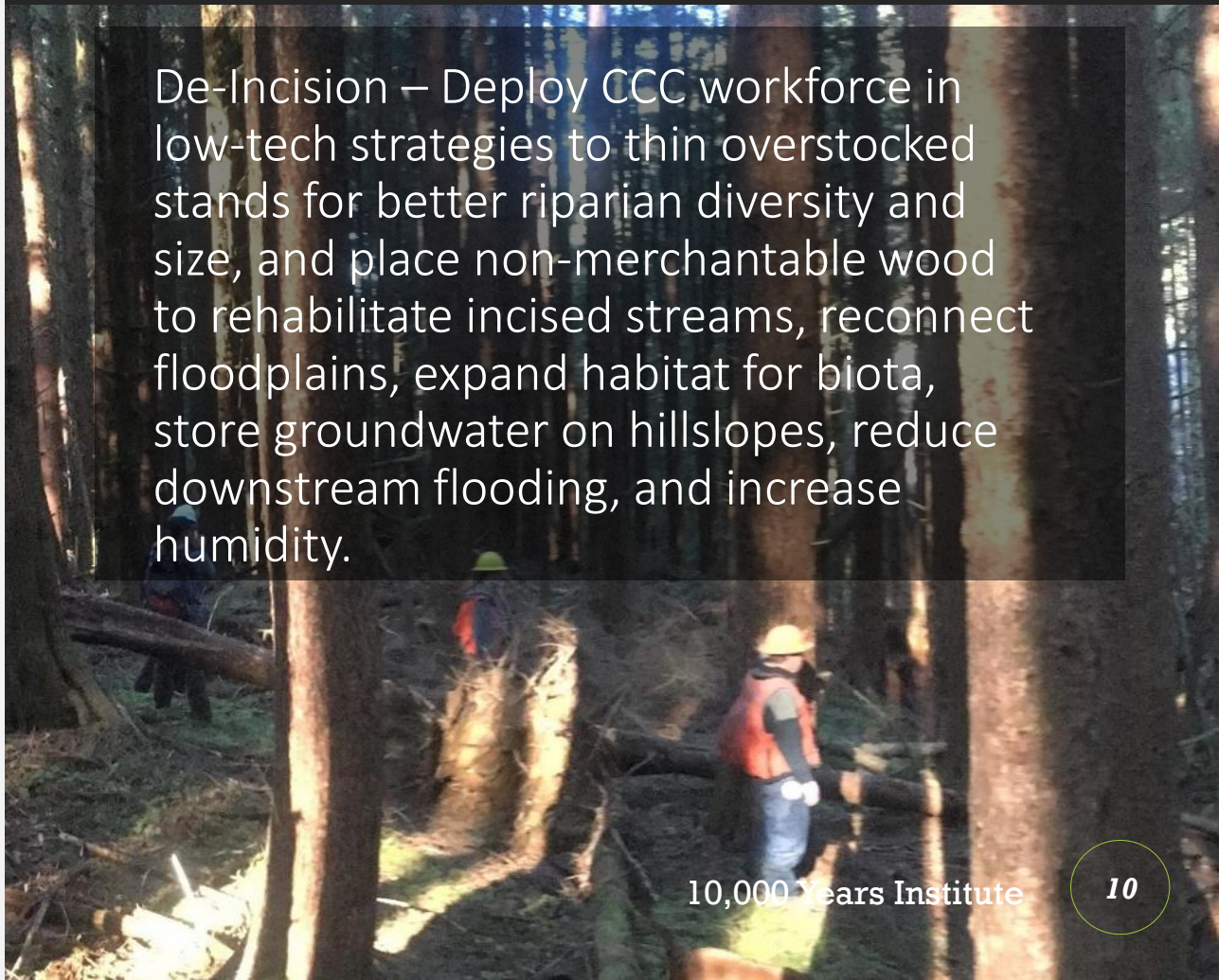
NCS: Goal 1a:

Forest Thinning for Improved Resilience

Non-merchantable and young stand thinning - riparian and stand treatments for forest growth, habitat, carbon storage, and biochar – need to manage our forests so there's value in all we take out and a reduced risk of wildfire

NCS Goal 1b:

Forestry-Focused Aquatic & Riparian Habitat Restoration



De-Incision – Deploy CCC workforce in low-tech strategies to thin overstocked stands for better riparian diversity and size, and place non-merchantable wood to rehabilitate incised streams, reconnect floodplains, expand habitat for biota, store groundwater on hillslopes, reduce downstream flooding, and increase humidity.

Challenges

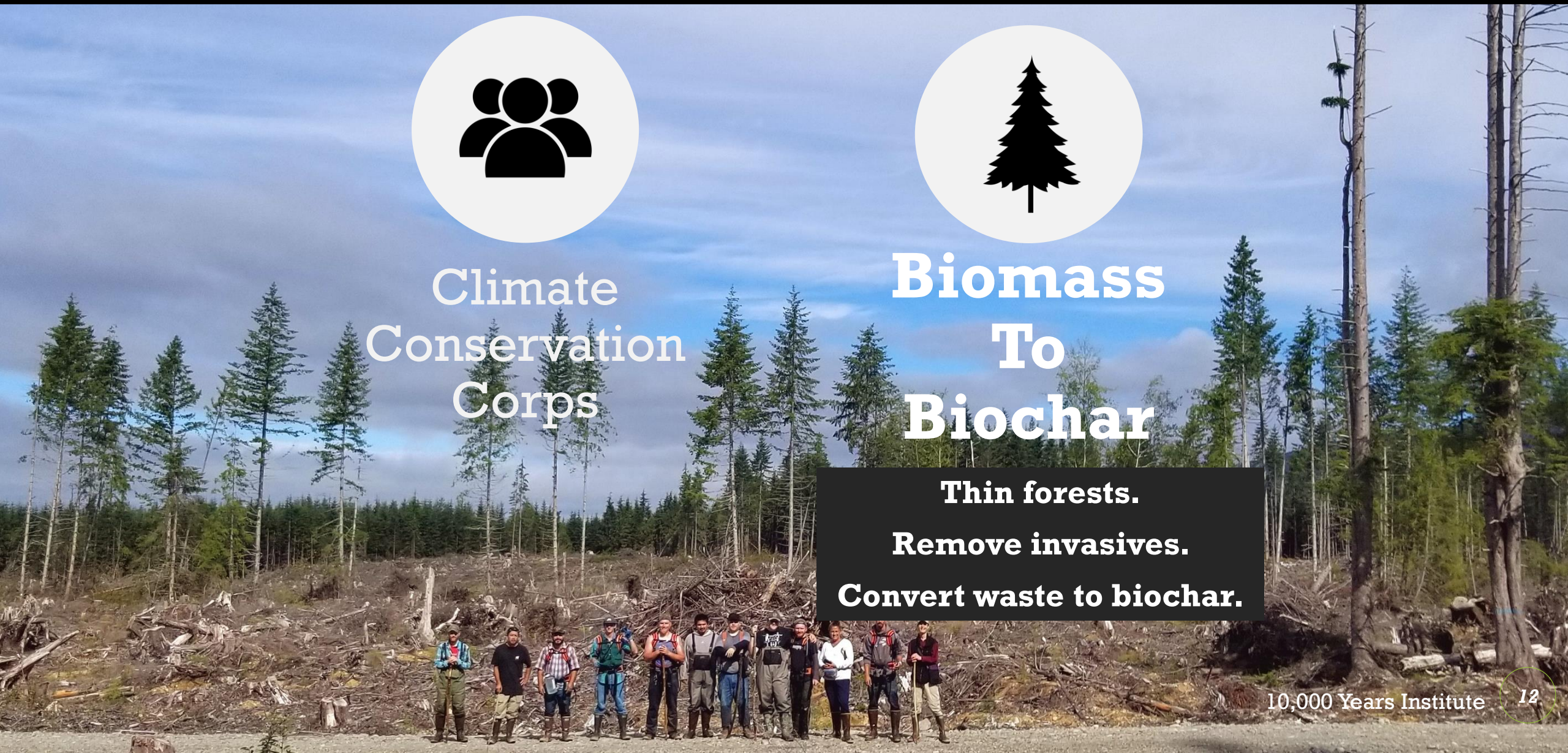
Wildfire Risk

Invasive Scotch broom and overly dense stands increase wildfire intensity and severity. Fire scarifies Scotch broom seeds, promotes germination.

Carbon, Methane, & PM Emissions

Slash pile burning emits carbon dioxide and methane, contributing to climate change, ocean acidification, sea level rise – and impacts human health.

Opportunities and Solutions



Climate Conservation Corps

Biomass To Biochar

Thin forests.

Remove invasives.

Convert waste to biochar.

Biochar

Solid carbon produced by pyrolysis of biomass in the absence of oxygen

Stores carbon for millennia, holds water in soils, and increases beneficial soil microbes for better plant growth

Carbon sequestration and carbon credits

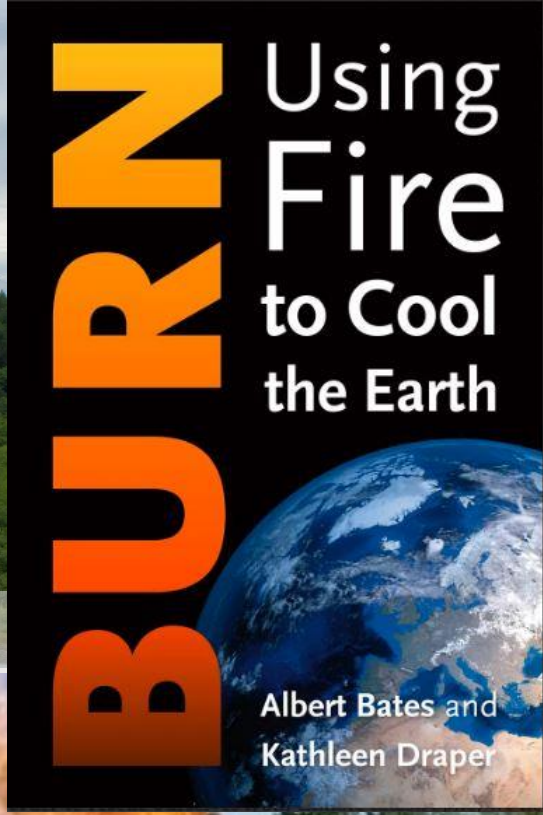
Water storage, filtration & purification

Binding agent for asphalt & concrete

Soil amendment

BIOCHAR – Using Fire to Cool the Earth
Rationale and Resources

https://biochar-us.org/presentations-biochar-woods-webinar-and-field-days-jan-feb-2022



Carbon Conservation Corps

Conduct mobile biochar production from waste biomass

Kelpie Wilson
Wilson Biochar Associates

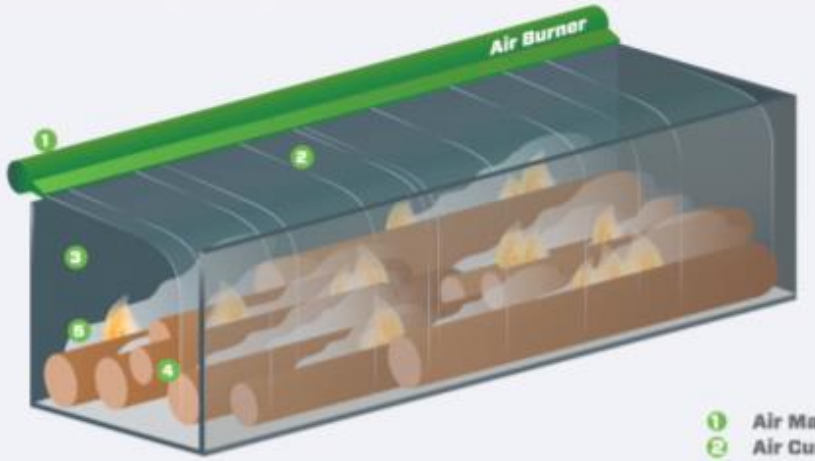
www.slideshare.net/kelpiew/a-carbon-conservation-corps-for-mobile-biochar-production

We already employ large hand crews in the dangerous work of firefighting.
We could use this labor to reduce fire danger by thinning overcrowded plantations, and improve forest soils by adding biochar, while sequestering carbon from the atmosphere.

Biochar Permit Challenges (Requires a $20K EPA permit for each site where one of these operates)

Char Boss: Curtain of air burns gases. Biochar withdrawn continuously through a grate.

1-2 tons (10-20 CY) per hour **IN**



1. Air Manifold
2. Air Curtain (left to right)
3. Firebox Refractory Wall
4. Wood Waste or Wood Fuel
5. Smoke (PM or Black Carbon)

1-2 tons (14CY)/day **OUT**

Air Burners Inc.- USFS Cooperative Research and Development Agreement

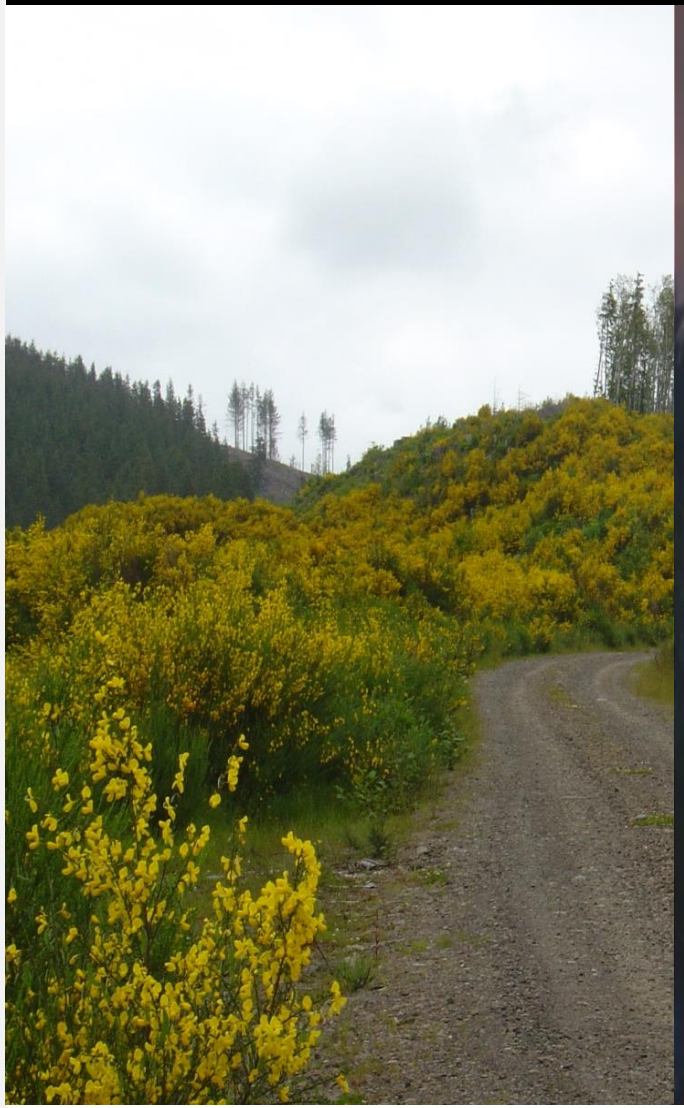
Applications to Support Investments in CCC and Forest Health

Carbon, Methane, & PM Emissions

Research – Carbon, Seedbank, Red Alder, Nutrients, Water, Mycorrhizae...

Remote Sensing - Aerial photography in May and more...

Scotch Broom Costs in the Washington State Economic Impact Analysis



- Cost to Oregon State Forests per year: $40,000,000/year
  2016 OR DOA Report:
  http://www.oregon.gov/oda/shared/documents/publications/weeds/ornoxiousweedeconomicimpact.pdf
- Cost to Washington State if not controlled: $142,800,000/year
  2017 WISC Report:
  http://www.invasivespecies.wa.gov/council_projects/economic_impact.shtml
- **Highly flammable - costs of wildfire hazard not yet internalized in analysis**
- Need to quantify costs to salmon recovery
- Need to quantify the cost to clean mines and certify clean gravel vs. the costs to control post-invasion
- $200/road mile to $3,000/acre (PTIR)

10,000 Years Institute Crews at Work

Partners, Collaborators, and Funders…

Quileute Nation

Washington State Recreation and Conservation Office

WSDA

WSDOT

FGS Fruit Growers Supply

Quinault Indian Tribe

Pacific Coast Salmon Coalition
Volunteers making a difference.

Wild Salmon Center

North Pacific Coast Lead Entity for Salmon Restoration

Coast Salmon Partnership

The Nature Conservancy

Trout Unlimited

Quinault Indian Nation

National Park Service

Forest Service U.S. Department of Agriculture

Clallam County 1854

Jefferson County Washington

Grays Harbor County 1854

Washington Department of Natural Resources

City of Forks
forkswashington.org

Thank YOU!

Want a CREW?

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