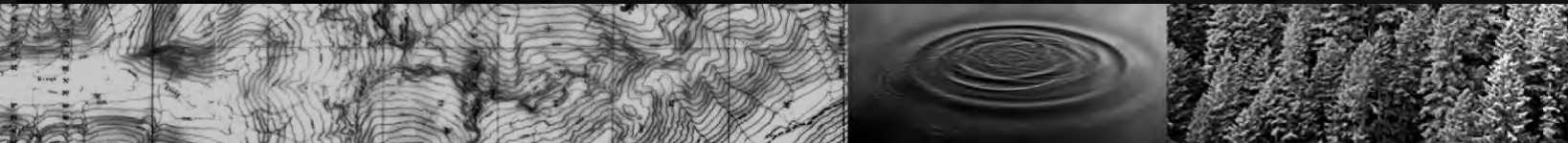


An aerial photograph showing a large, cleared area in a dense forest. A building with a white roof and a red section is visible in the middle ground. The surrounding area is covered in lush green trees. A dark semi-transparent box is overlaid on the left side of the image, containing white text.

Coastal Conservation Corps & Biomass Optimization Center Program Development

Jill Silver, Executive Director
10,000 Years Institute



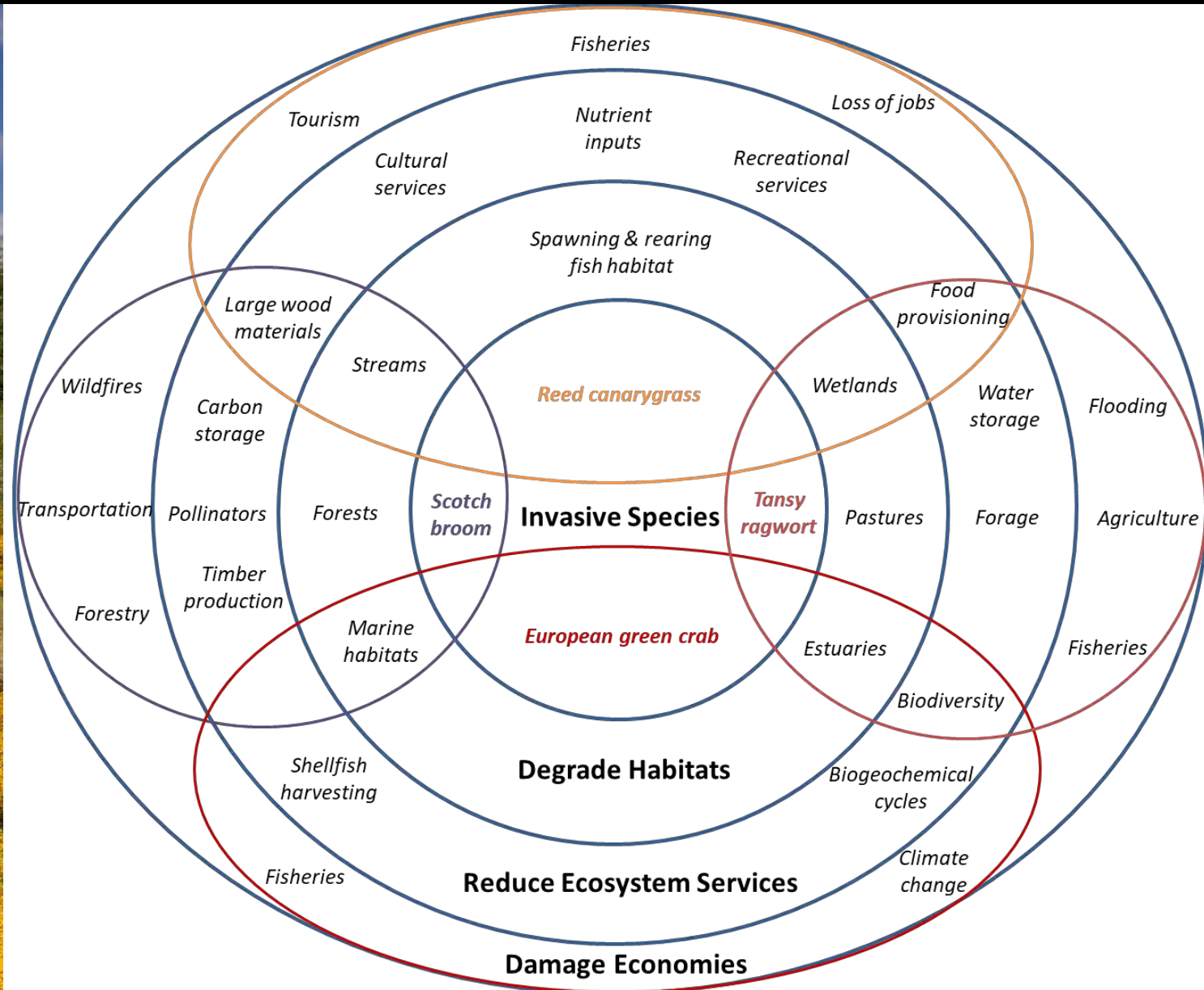
An aerial photograph of a river system flowing through a dense, green forest. The river has multiple channels and sandy banks with scattered driftwood. In the background, there are rolling hills and mountains under a blue sky with light clouds.

About Us

At 10KYI, we evaluate the effects of human activities on natural environments – the forests, rivers, wetlands and estuaries that sustain our communities and ecosystems.

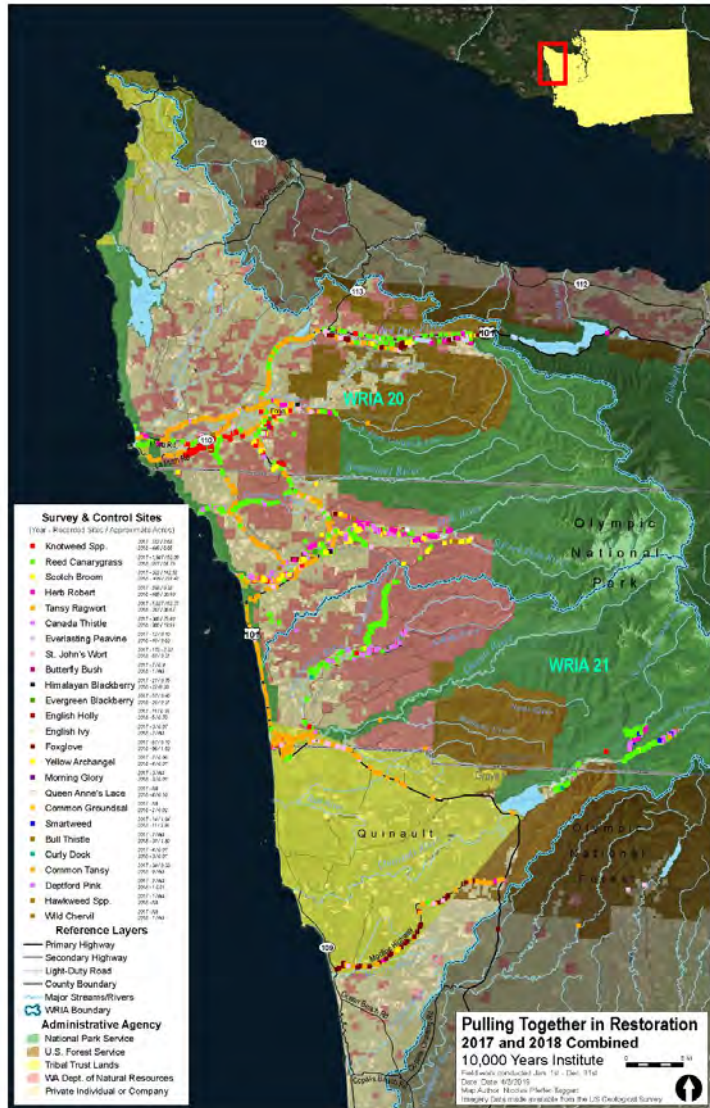
Through development of innovative, science-based approaches to restore ecological integrity, we promote sustainable practices in landscapes across the region.

Invasive Species do not provide Ecosystem Services... *...and cost \$billions\$ to control...*

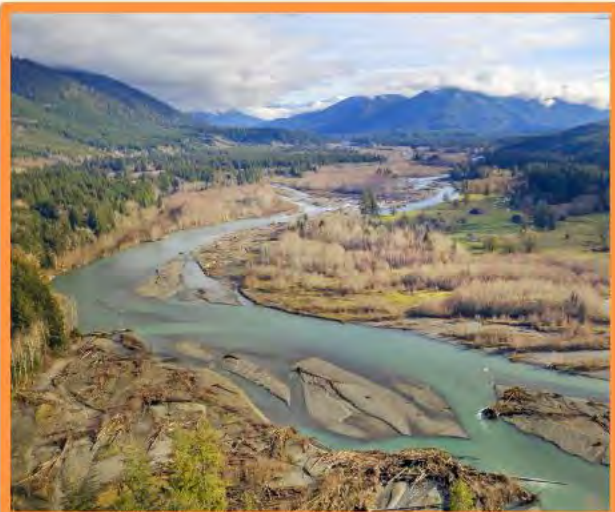


WCRRI: 10KYI's *Pulling Together* in Restoration Project

Preventing the spread of invasive species in coastal watersheds, providing training and local jobs for local work



10,000 Years Institute



Increased glacial sediment to channels results in channel scour and deposition



Loss of big mature riparian forests



Resulting in the loss of...



...cold water, shade, food for all native species, downed wood, deep pools, and side channel and off-channel habitats.



Replacing early successional riparian species (willow & alder)



Accidental introduction of Scotch Broom

Challenges



Rural Communities Need Jobs, Training, & Housing



The COVID pandemic, lack of training opportunities, and the loss of forestry and fisheries jobs in rural coastal communities has led to increased unemployment, under-employment, and migration from rural areas to cities.

Challenges



Declining Forest Health



Forests need thinning and invasive plant management to increase understory plant growth, grow trees faster, and improve habitat quality.

Challenges

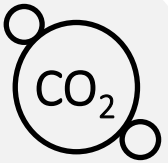


**Wildfire
Risk**



Invasive Scotch broom and overly dense stands increase wildfire intensity and severity.

Challenges

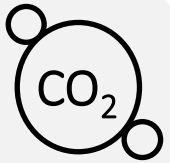


Waste & Energy Management



Rural communities on the coast face high costs for transportation of goods and services, and many challenges for waste management.

Challenges



**Carbon,
Methane,
& PM
Emissions**



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

Opportunities and Solutions



Coastal Conservation Corps

Provide permanent place-based jobs



Biomass Optimization Center

Convert waste to products, energy and biochar



Coastal Conservation Corps

A permanent place-based Conservation Corps is the next logical step...

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



Coastal Conservation Corps

A Coastal Conservation Corps will focus on critical and under-funded resource management tasks



Photo by: CSIRO



Photo by: Wild Salmon Center/Trout Unlimited



Forestry

- Forest thinning
- Young stand thinning
- Biomass for biochar
- Wildfire fuels reduction
- Invasive species:
 - Scotch broom
 - Reed canarygrass
 - Herb Robert

Marine

- Marine debris collection
- Invasive species:
 - European green crab
 - Spartina
 - Scotch broom
 - Gorse

Restoration

- Road maintenance
- Restoration project support
- Native plant revegetation
- Invasive species:
 - Scotch broom
 - Reed canarygrass
 - Herb Robert

Recreation

- Trails
- Facilities maintenance
- Bunkhouse construction for crews
- Invasive species:
 - Herb Robert

Coastal Conservation Corps

Invasive plant management supports clean gravel, forests, roads, and property values

Gravel mines



Coastal Conservation Corps

Invasive plant management on roads - roads act as pathways for 'propagules'...



Gravel mines



Roadsides

Coastal Conservation Corps

Invasive plant management in forest harvest units – as sources that travel to rivers

Gravel mines



Roadsides



**Forests and
Rivers**



Coastal Conservation Corps

Invasive plant management in river corridors and floodplains to protect salmon and water



Gravel mines



Roadsides



**Forests and
Rivers**



Impacting forest succession

Scotch Broom Costs in the 2017 Washington State Economic Impact Analysis of Invasive Species

- 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 the cost to clean mines and certify clean gravel vs. the costs to control post-invasion
- Need to quantify costs to **Salmon Recovery**
- \$200/road mile to \$3,000/acre (10KYI/PTIR calculation)

Opportunities and Solutions



Coastal Conservation Corps

Provide permanent place-based jobs



Biomass Optimization Center

Convert waste to wood products, energy and biochar



Coastal Conservation Corps

Forestry Support – Our forests need thinning!

Non-merchantable and young stand thinning, and riparian treatments to enhance forest growth, improve habitat for multiple species, increase carbon storage, and make biochar



Coastal Conservation Corps

Forest, Riparian, and Stream Channel Restoration

De-Incision – Deploy the CCC workforce and thinned non-merchantable biomass to rehabilitate incised streams, reconnecting floodplains to store groundwater, reducing downstream flooding, and increasing humidity to reduce wildfire risk



Coastal Conservation Corps

Forest, Riparian, and Stream Channel Restoration

Recover the diversity, the age classes, and the homes and food for forest species with thinning and biochar, and store tons of carbon in soil, live and dead biomass to protect our coastal ecosystems – and produce trees and materials for mills and homes!



Opportunities and Solutions



Coastal Conservation Corps

Provide permanent place-based jobs



Biomass Optimization Center

Convert waste to wood products, energy and biochar



Carbon Conservation Corps

For mobile biochar production



We already employ large hand crews in the dangerous work of fire fighting. 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.



Kelpie Wilson
Wilson Biochar Associates



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

Biomass Optimization Center



Sorting & Operations Center



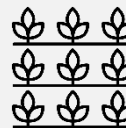
Training & Demonstration Center



Bunk Housing for CCC



Greenhouse

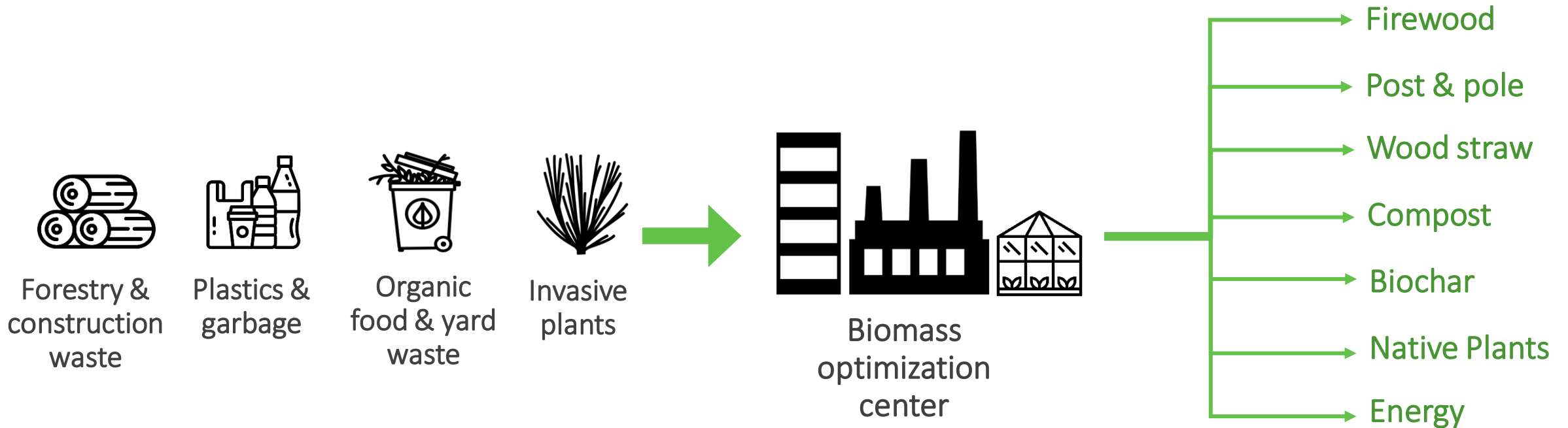


Native Plant Nursery



Biomass Optimization Center

Sorting & Operations Center



Direct Jobs

Coastal Conservation Corps
Feedstock procurement
Biomass transporters

BOC engineers
Process & general managers
Material handlers
Equipment maintenance

Product sellers
Transportation of finished goods

Biomass Optimization Center

Conceptual Metrics - Developed by The Devonshire Group LLC

Sort Yard Conversion Operators Annual Metrics for Hood River BUC

	Feedstock Bone Dry Ton	Revenues (\$ millions)	Direct Jobs	Indirect Jobs	Forest Acres Remediated
Firewood and Beauty Bark	5,000	?	6	?	?
Post & Pole	--	--	--	--	--
Wood Straw & Crumbles	3,700	\$1.5	5	?	?
Cross Laminated Timber	--	--	--	--	?
Biochar	40,000	\$20.0	15	?	?
Combined Heat & Power*	12,000	?	15	?	?
TOTAL	60,000	~\$30	40	200	6,000**

*The combined heat and power greenhouse operation in Carson, WA Wind River Renewable Energy is included

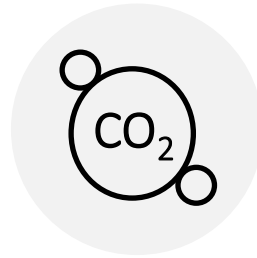
**Based on 10 tons of non-merchandisable biomass in each acre of forest to be treated for fuels reduction



Biochar

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

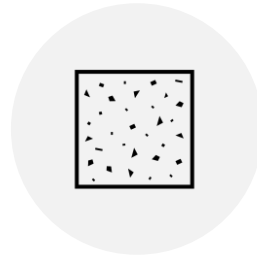
Stores carbon for millennia, stores water



Carbon sequestration



Water filtration & purification



Binding agent for asphalt & concrete



Soil amendment

Biochar Permit Challenges

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



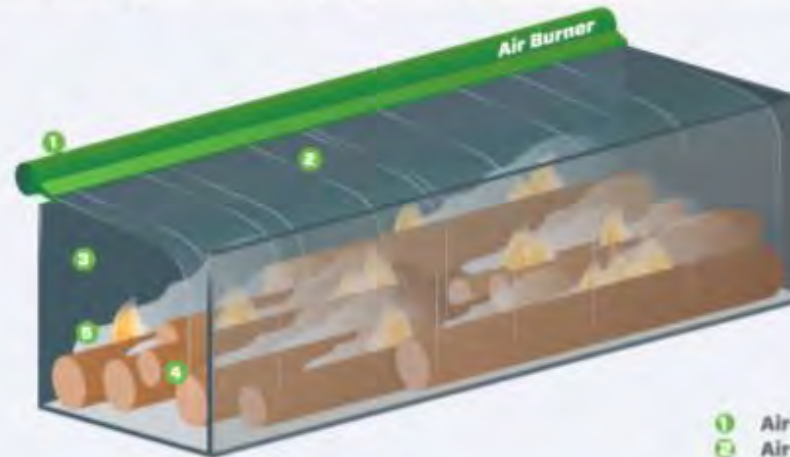
Airburners.com

Air Burners Inc.- USFS Cooperative
Research and Development Agreement



USFS Monthly Biochar Webinar Series 2020: Production

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

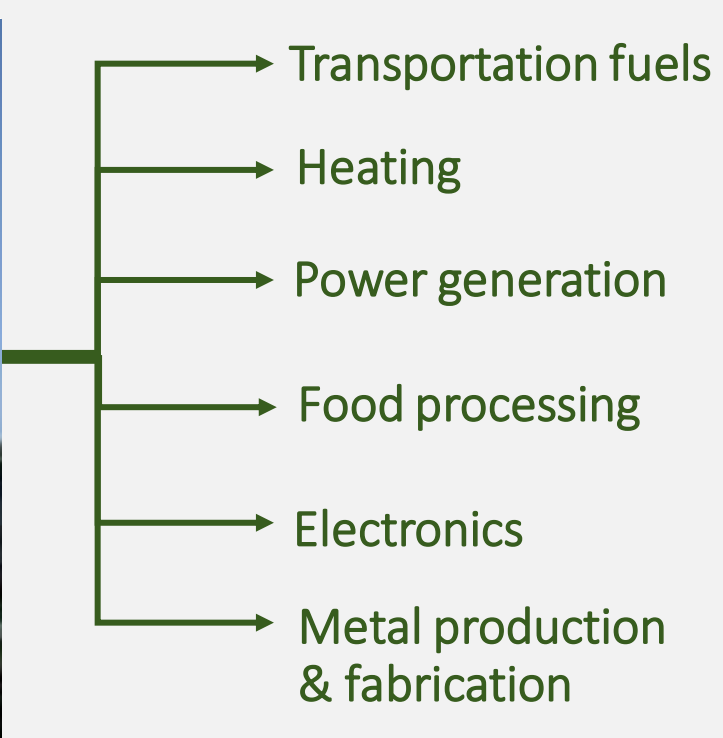


- 1 Air Manifold
- 2 Air Curtain (left to right)
- 3 Firebox Refractory Wall
- 4 Wood Waste or Wood Fuel
- 5 Smoke (PM or Black Carbon)



1-2 tons
(14CY)/day OUT





Why use hydrogen as an anchor tenant?

- 15-year operational history
- Recover CapEx in 6 years
- Ultra low emissions. Scrub other systems' particulates & unwanted gasses
- Has an immediate commodity market. No "selling" required.
- Process is managed from network operations center.
- Supplier is fully supported, including Washington lobbyist & PR firm.
- Provides funding access to DoE and others.
- Demand for product is sure to increase with no effort required by forest sector.
- Garbage is the 'Bridge Over the Valley of Death'.

Hydrogen & Power

Regionally-distributed, to be made locally and made available to local users from local waste that would otherwise be landfilled or burned in slash piles and burn barrels...

Source: The Devonshire Group LLC

NODC - SWOT Analysis 2016-2020 - SWOTS in Forestry

Strengths	Weakness	Opportunities for a CCC	Threats
Forests	Declines in forest health	Restoration thinning	Climate change, Scotch broom
	Lack of skilled workforce	Thinning, biochar production and distribution	Stagnating forests, wildfire risk
	Loss of mills	Healthy forests growing big trees	Loss of income to communities
	Costs of transportation	Road maintenance and fish passage/slope stability	Road failures, and habitat impacts
	Costs of energy	Opportunities for BOCs	
		Development of value-added products	
		Waste biomass to ENERGY	
		Green hydrogen, biodiesel, syngas, electricity	
		Green policies to promote green infrastructure	
		Ecosystem Services Valuation - Fees for services	

Coastal Conservation Corps Provisional Budget – Per Year

Staff		Equipment		Vehicles		Housing
Crew <i>120 @ \$35/hour</i>	\$8,400,000	Forest	\$20,000	Trucks <i>30 @ \$28K</i>	\$840,000	???
Supervisors <i>10 @ \$45/hour</i>	\$900,000	Invasives	\$10,000	Boats	?	
Trainers <i>10 @ \$60/hour</i>	\$300,000	Roads/Trails	?			
Subtotal	\$9,600,000		\$30,000		\$840,000	

Total: \$10,470,000

Let's Build a Coastal Conservation Corps!

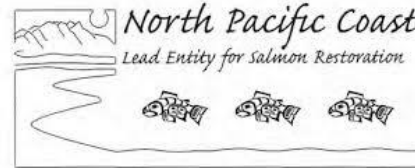
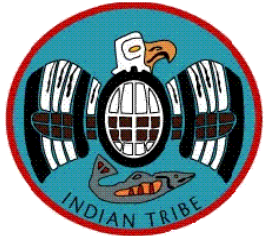
- Budget: \$20-30 million per biennium
- 130 fulltime, year 'round satisfying jobs
- Partnerships with federal, state, local, tribal, private and non-profits
- Save \$30 billion in impacts and provide community stability


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www.10000yearsinstitute.org 🌐




Partners, Collaborators, and Funders






Team up? Thank YOU!

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