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# Biochar Protocol v1.0

*Feedstock Eligibility*

Workgroup Meeting 2  
November 17, 2022

# Housekeeping

- Workgroup members have the opportunity to actively participate throughout the meeting
  - Ask that you keep yourselves muted unless / until you would like to speak
- We will ask and take questions throughout the session
- All other attendees/observers are in listen-only mode
- Observers are free to submit questions in the Zoom Q&A dialog
- We will follow up via email to answer any questions not addressed during the meeting
- The slides and a recording of the presentation will be posted online

# Purpose

- Solicit feedback on proposed approach and initial details concerning feedstock eligibility and related environmental safeguards



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# AGENDA

- Re-Introductions
- Context for Discussion
- Eligible Feedstocks
- Environmental Standards for Eligible Feedstocks
- Next steps

## Reserve Staff:

- Jon Remucal, Associate Director of Nature-Based Solutions
  - Protocol development lead
- Holly Davison, Associate Director of Programs & Marissa Spence, Forestry Manager
  - Protocol development support

## External drafting support:

- John Nickerson, Dogwood Springs Forestry

# Workgroup Members

Name (alphabetical)	Organization
Akio Enders	International Biochar Initiative
Allison Flynn	Arq
Bruce Springsteen	Placer County Air Pollution Control District
Daniel Sanchez	University of California - Berkeley
David Morell	Sonoma Ecology Center
Hannes Etter	South Pole Carbon Asset
Jeff Cole	Royal Dutch Shell
Johannes Lehmann	Cornell University
Jonah Levine	Biochar Solutions
Xiaomei Li	Viresco Solutions

# Workgroup Members

Name (alphabetical)	Organization
Josiah Hunt	Pacific Biochar
Kevin Fingerman	Humboldt State University
Matt Ramlow	World Resources Institute
Melissa Leung	GECA Environment
Micah Elias	Blue Forest Conservation / University of California - Berkeley
Nate Anderson	US Forest Service
Patricio Ortiz	ACT Commodities
Phil Saska	Blue Forest Conservation
Rachel Rubin	Woodwell Climate Research Center*
Shawn McMahon	Aster Global
Tristan Brown	SUNY College of Environmental Science & Forestry

# Funding support



## U.S. Forest Service Wood Innovations Program



## CAL FIRE Forest Health Grant

Funding also supporting:

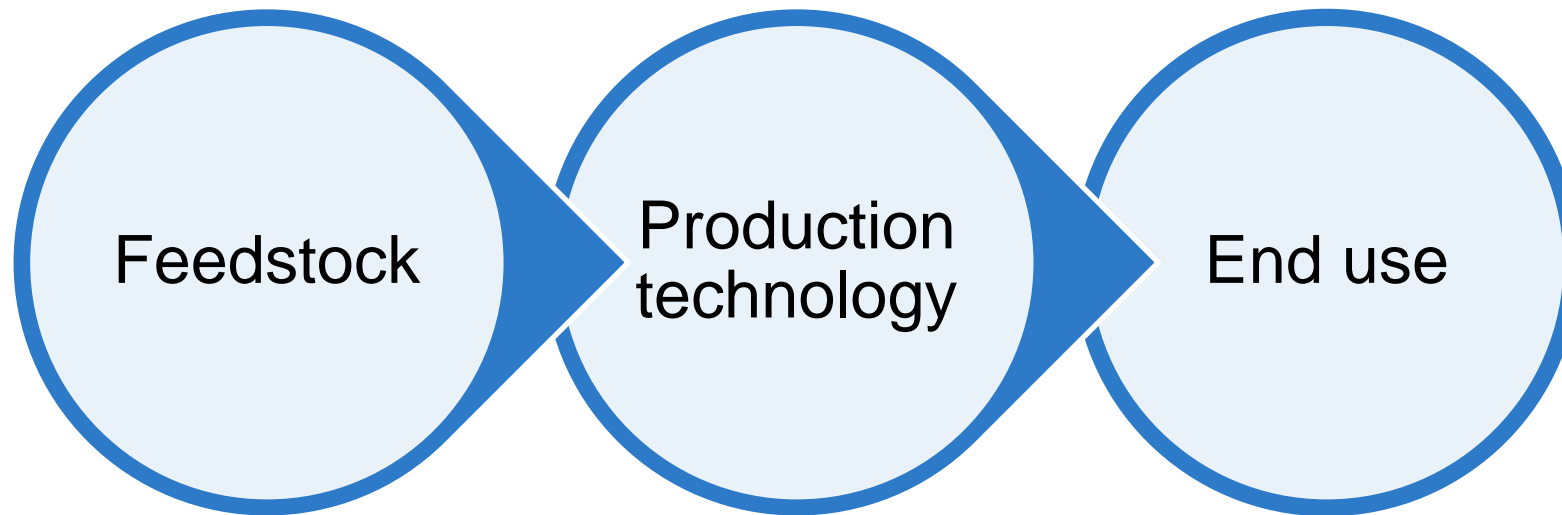
- Companion market analysis by Blue Forest Conservation (with additional funding support from the Doris Duke Charitable Foundation), **now available on the Biochar Protocol webpage**
- Pilot projects to test protocol and demonstrate its viability and versatility





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# FEEDSTOCK ELIGIBILITY AND ENVIRONMENTAL SAFEGUARDS



The conversion of waste or by-product biomass material into biochar, which can be used in soil and non-soil applications to facilitate the long-term sequestration of carbon.

General protocol focus on standardization and project efficiency – not trying to capture every possible configuration. ***But owing to environmental concerns, we do need to be more specific about feedstocks that are eligible.***

## Chain of custody documentation

- Transfers of biomass from feedstock source to biochar producer to end user
- Feedstock characterization
- End use description

## Data collection

- Amount of biochar produced
- Estimate of recalcitrance
  - Lab testing of biochar samples

## Verification

- Documentation and data review
- Site visit



# Feedstock Categories and Sources

Waste or by-product biomass sources (i.e., typically have no economic use) to be converted into biochar.

Positive list with categories and specifically approved sources within each category.

- External document
- Update as needed to add new sources, considering appropriate sustainability and baseline requirements
- Review annually to ensure included sources should remain listed

Feedback on existing list

Remove any listed categories and/or sources?

Add any other categories and/or sources?

# Feedstock Categories and Sources

Category	Specifically Approved Sources
Agricultural waste	<ul style="list-style-type: none"><li>• Harvest residues</li><li>• Orchard/vineyard/woody biomass prunings</li><li>• Orchard/vineyard renewal clearings</li><li>• Fruit and vegetable residues, including nut shells</li></ul>
Forestry waste	<ul style="list-style-type: none"><li>• Harvest and forest management residues</li><li>• Fuel reduction/forest health activity waste/residues</li><li>• Agroforestry and rangeland woody biomass management</li><li>• Non-merchantable post-disturbance (e.g., fire, windthrow) woody biomass</li></ul>
Animal husbandry waste	Manure
Aquaculture by-products	Plants/organisms growing as by-product of aquaculture operations (e.g., seaweed, waste algae)

# Feedstock Categories and Sources

Category	Specifically Approved Sources
Bio-digester waste	Fermentation residues
Food processing residues	<ul style="list-style-type: none"><li>• By-products/residues from food processing operations</li><li>• Expired food</li><li>• Food service (e.g., restaurants/kitchens) organic waste/residues</li></ul>
Wood processing	By-products/residues from wood processing facilities
Urban waste	<ul style="list-style-type: none"><li>• Urban/rural green waste (e.g., prunings/cuttings, landscaping waste, construction/lumber waste)</li><li>• Waste paper and cardboard</li><li>• <b>Biomass component of industrial/municipal solid waste</b></li></ul>
Sewage sludge	Biosolids

# Feedstock Environmental Safeguards

Goal: Prevent unintended adverse environmental impacts (e.g., land use change, degradation) driven by the project activity—the diversion of waste/by-product biomass from a business-as-usual fate to produce biochar

The action of harvesting or producing biomass does not have a principal purpose of biochar production

- e.g., main purpose of logging is to harvest timber to produce harvested wood products, with residual/waste material being harvested for biochar
- Biomass is a waste or by-product
- **Purpose-grown feedstocks not eligible**

# Feedstock Environmental Safeguards

Current economics surrounding biochar may provide adequate assurances around environmental concerns with respect to feedstocks being waste or by-products from other activities.

Concern is if the economics of biochar are favorable in a way that leads to harvesting/producing biochar being a driving factor for management/biomass use decisions.

→ Comes back to demonstrating the feedstock source is the waste/by-product of other activities

Avoidance of unintended adverse environmental impacts is also supported by:

- Regulatory compliance requirements
- Chain-of-custody tracking
- Materials standards testing

Are the environmental safeguards specified sufficient, especially in the context of existing environmental laws regulations? Can compliance be readily documented and verified?



# Feedstock Environmental Safeguards

Category	Specified Source	Environmental Safeguard
Agricultural waste	Harvest residues	Documentation that residues of sufficient amount retained to maintain soil organic C and productivity of the site
	<ul style="list-style-type: none"><li>• Orchard/vineyard/woody biomass prunings</li><li>• Orchard/vineyard renewal clearings</li><li>• Fruit and vegetable residues, including nut shells</li></ul>	Demonstrate activity is part of normal management operations

# Feedstock Environmental Safeguards

Category	Specified Source	Environmental Safeguard
Forestry waste	<ul style="list-style-type: none"><li>• Harvest and forest management residues</li><li>• Fuel reduction/forest health activity waste/residues</li><li>• Non-merchantable post-disturbance (e.g., fire, windthrow) woody biomass</li></ul>	Demonstration that feedstock is waste or by-product of operations*
	Agroforestry and rangeland woody biomass management	Activity is part of typical management cycle/operations
Animal husbandry waste	Manure	None*

\*Subject to all relevant legal requirements at feedstock sourcing, biochar production, and end use phases, and to materials standards requirements

# Feedstock Environmental Safeguards

Category	Specified Source	Environmental Safeguard
Aquaculture by-products	Plants/organisms growing as a by-product to aquaculture operations, such as seaweed, waste algae, invasive plant species	Demonstrate that invasive plant species were not purposely introduced to qualify as feedstock for biochar production
Bio-digester waste	Fermentation residues	None*
Food processing residues	By-products/residues from food processing operations	Rate of residue per unit of food processed must not increase to provide biochar feedstock
	<ul style="list-style-type: none"> <li>Expired food</li> <li>Food service (e.g., restaurants/kitchens) organic waste/residues</li> </ul>	None*

\*Subject to all relevant legal requirements at feedstock sourcing, biochar production, and end use phases, and to materials standards requirements

# Feedstock Environmental Safeguards

Category	Specified Source	Environmental Safeguard
Wood processing	By-products/residues from wood processing facilities	None*
Urban waste	<ul style="list-style-type: none"><li>• Urban/rural green waste (e.g., prunings/cuttings, landscaping waste, construction/lumber waste)</li><li>• Waste paper and cardboard</li><li>• Biomass component of industrial/municipal solid waste</li></ul>	None*
Sewage sludge	Biosolids	None*

\*Subject to all relevant legal requirements at feedstock sourcing, biochar production, and end use phases, and to materials standards requirements



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# NEXT STEPS

# Next Steps

- Reserve staff will provide draft positive list with environmental safeguards to workgroup
- **Email comments/feedback on feedstocks by December 5**
- Reach out any time to discuss protocol topics or process
- Protocol drafting by Reserve staff – *ongoing*
- ***Scheduling email to be sent out later today:***
  - *Workgroup Meeting 3 – Baseline setting – Week of December 5*
  - *Workgroup Meeting 4 – End use eligibility and permanence – Week of December 12*

# Key contacts



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## **Protocol development lead:**

Jon Remucal, Associate Director of Nature-Based Solutions

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## **General inquiries:**

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