



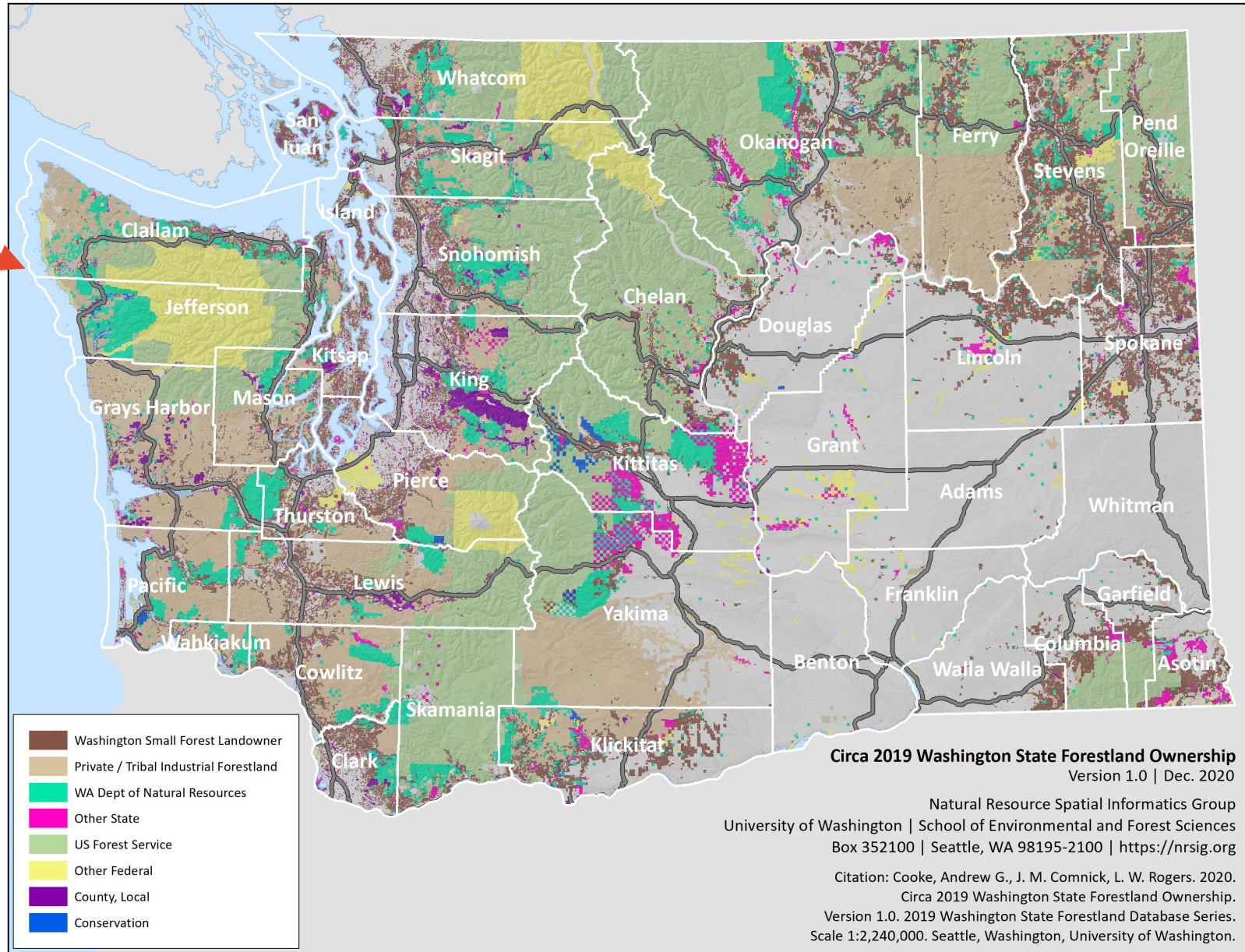
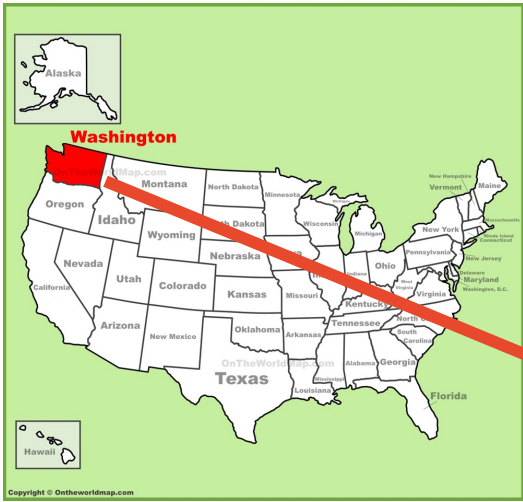
# Small Woodland Owners & the Value of Place-Based Biochar

---

Elaine Oneil, PhD

Executive Director

Washington Farm Forest Association



**Circa 2019 Washington State Forestland Ownership**  
Version 1.0 | Dec. 2020

Natural Resource Spatial Informatics Group  
University of Washington | School of Environmental and Forest Sciences  
Box 352100 | Seattle, WA 98195-2100 | <https://nrsig.org>

Citation: Cooke, Andrew G., J. M. Cornick, L. W. Rogers. 2020.  
Circa 2019 Washington State Forestland Ownership.  
Version 1.0. 2019 Washington State Forestland Database Series.  
Scale 1:2,240,000. Seattle, Washington, University of Washington.



# Small Forest Landowner Statistics (2019)

Half-State	Acreage Class	Parcel Acres (2019)	Forested Acres (2019)	Number of Owners*
East	2-20	233,277	145,682	26,176
East	20-100	638,459	432,082	17,617
East	100-1000	1,131,649	608,948	5,187
East	1000-5000	689,963	233,611	618
East	5000+	109,242	39,409	32
East	All Classes	2,802,589	1,459,732	49,375
West	2-20	739,354	492,574	126,937
West	20-100	638,156	446,825	23,060
West	100-1000	541,794	402,282	4,167
West	1000-5000	102,936	82,705	124
West	All Classes	2,022,240	1,424,386	154,014

[s://nrsig.org/projects/small-forest-landowner-regulatory-impacts/files/Small-Forestland-Owners-ESSB-5330-Report-2021011.pdf](https://nrsig.org/projects/small-forest-landowner-regulatory-impacts/files/Small-Forestland-Owners-ESSB-5330-Report-2021011.pdf)



# Many reasons to own forest land

Page 92 of

<https://nrsig.org/projects/small-forest-landowner-regulatory-impacts/files/Small-Forestland-SSB-5330-Report-2021011.pdf>

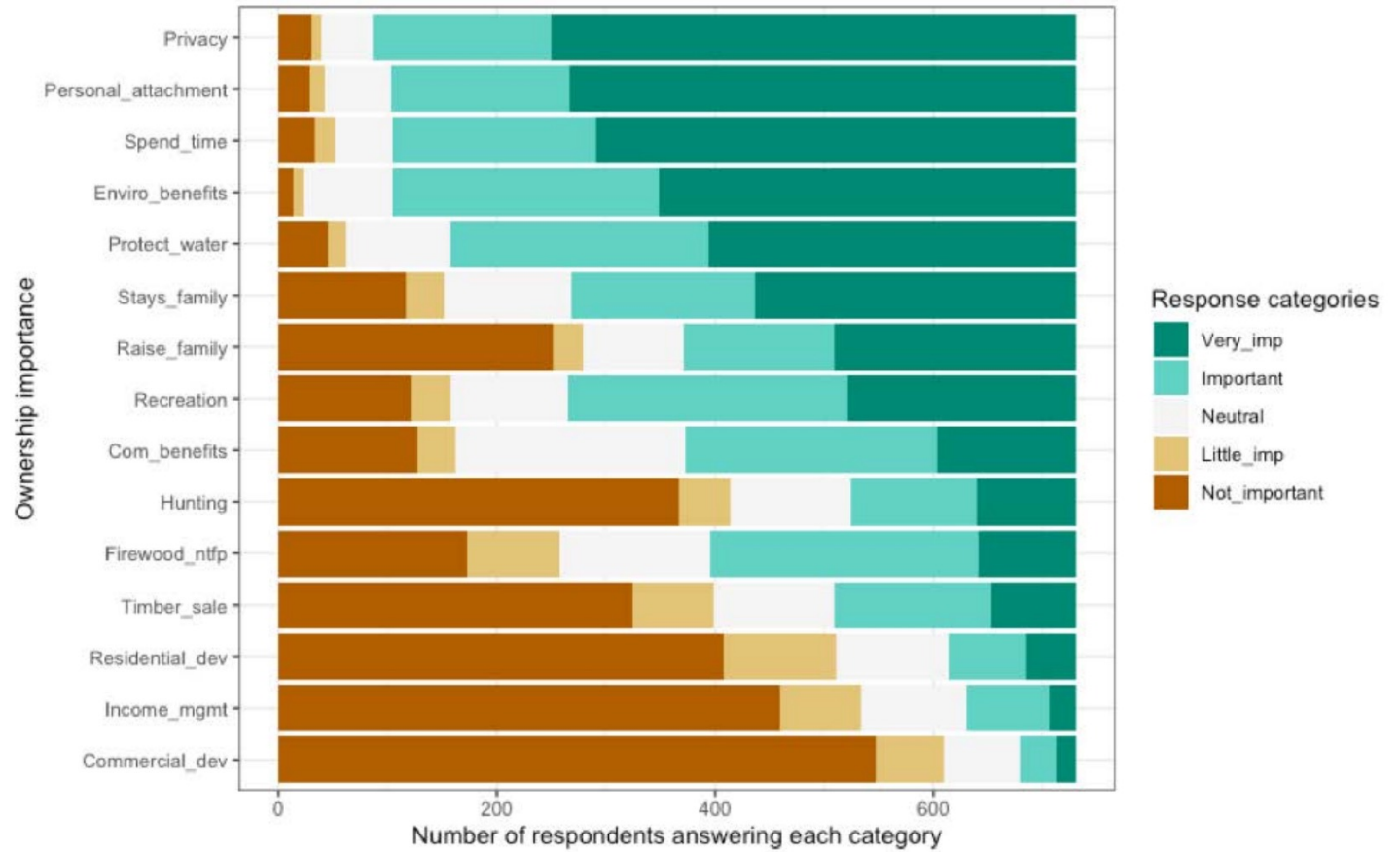


Figure 13. The distribution of answers to the importance of 15 aspects of forest ownership objectives from the 2020 GP survey. Objectives are presented in descending order of frequency of the “very important” response category.

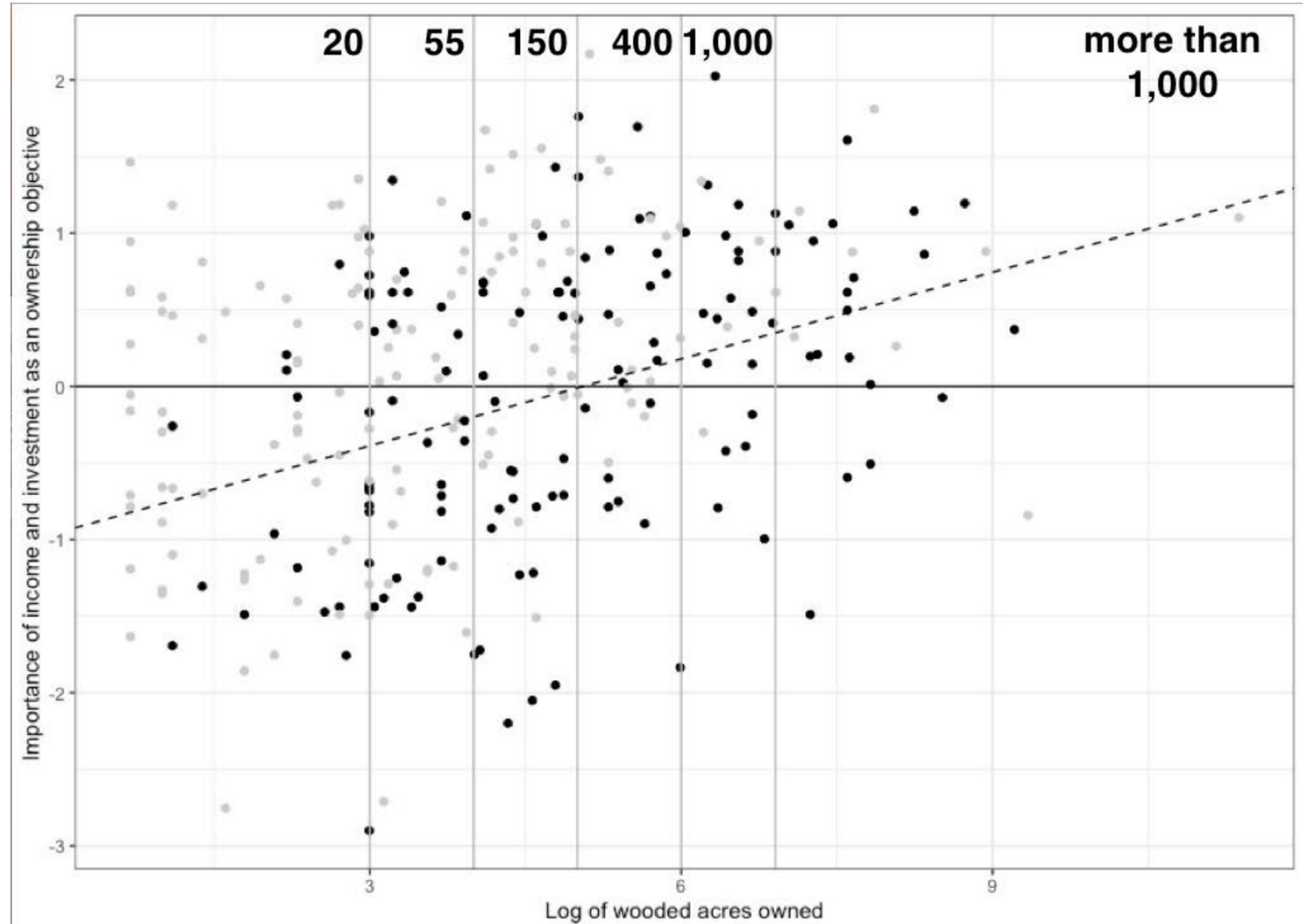


# Income Matters

- High variability
- More importance on larger acreages

- Grey dots are westside owners
- black dots are eastside owners

Page 96 of <https://nrsig.org/projects/small-forest-landowner-regulatory-impacts/files/Small-Forestland-Owners-ESSB-5330-Report-2021011.pdf>



# Survey Q: What will help small forest landowners dealing with economic losses due to regulation?

Carbon #1

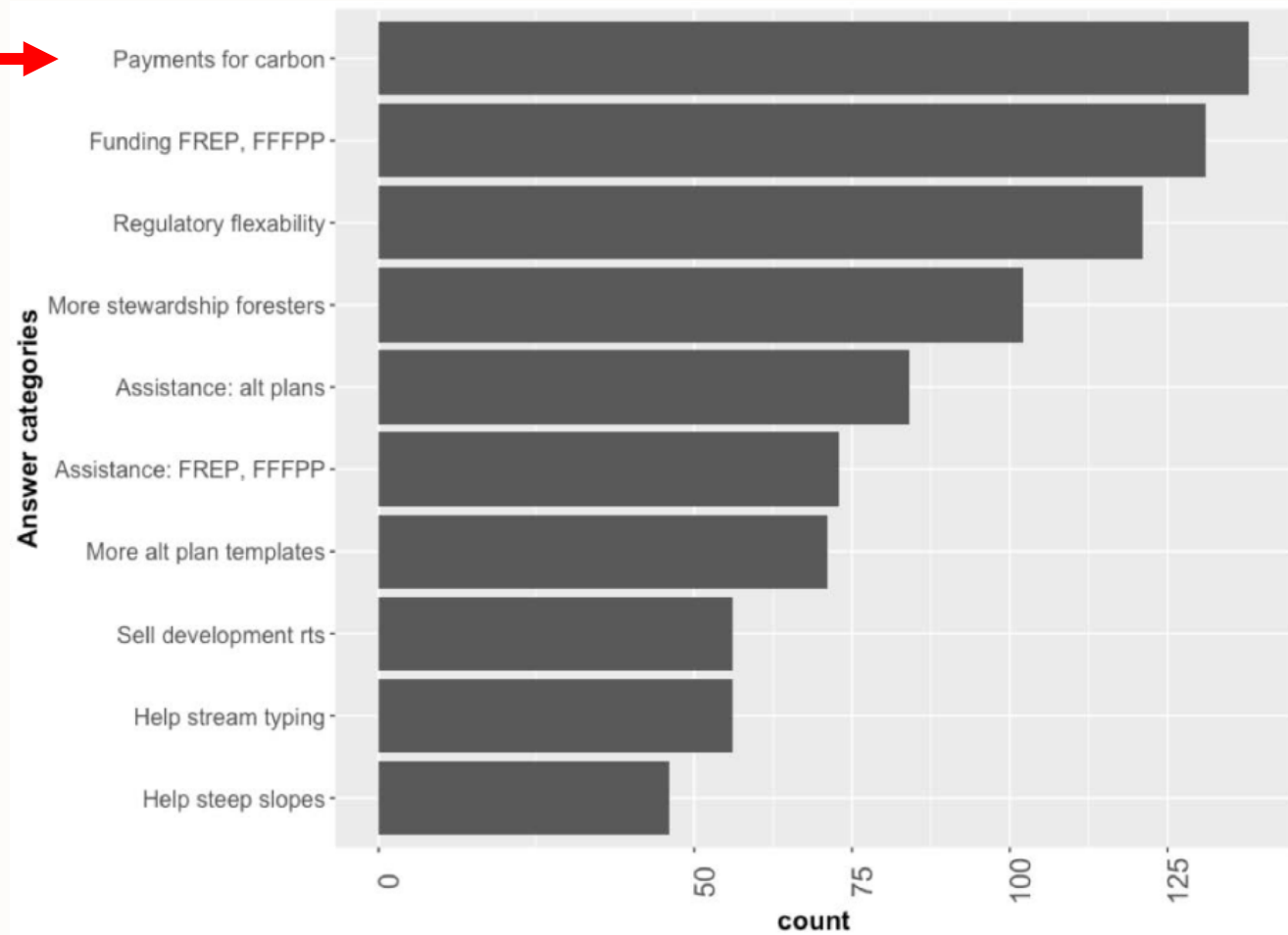
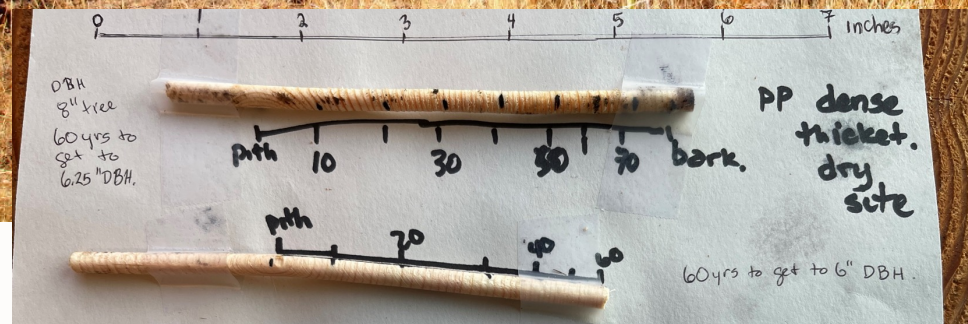


Figure 96 from

<https://nrsig.org/projects/small-forest-landowner-regulatory-impacts/files/Small-Forestland-Owners-ESSB-5330-Report-2021011.pdf>



# West vs East Two Completely Different Ecosystems





# Biochar as a solution on tough sites?

Photo Credits:  
Ken Miller





# Fire Risk Reduction is a MUST in eastern Washington



Photo Credits: Tony Craven



# Options include mastication and/or piling and burning



Photo Credits:  
Tony Craven



# Or logging and thinning

Photo Monitoring Point 13 South

Photo Monitoring Point 13 South



February 2011

Pre-logging and thinning



February 2011

Post logging and thinning

Photo Credit:  
Dale Swedberg



# Then broadcast burning

Photo Monitoring Point 13 South



May 2013

Post prescribed burn

Photo Monitoring Point 13 South



June 2015

Post prescribed burn

Photo Credit:  
Dale Swedberg



# Traditional Methods Require Skill, Finances, Time, (and Luck in the weather)

- Often not well suited to small acreages
- Skill sets are uncommon in SFLO community
- Often financially out of reach
- High risk
- Limited windows of (weather) opportunity
- Difficult to verify carbon benefit



# Another Option: Small Scale Biochar Technologies



Micro scale: e.g. Ring of Fire Biochar Kiln

Photo Credit:  
Kelpie Wilson

Just one problem: In order to create biochar in small scale technologies we needed a law change in Washington State



Mini scale - e.g. BurnBoss T24

<https://airburners.com/products/boss-series/burnboss/>



# We proposed a biochar bill

[Reports Home](#) | [Bill History](#) | [Bill Tracking](#) | [Docs](#) | [Bills By Citation](#) | [Bill Sponsors](#) | [Bills In/O](#)

**Bill Information** > SB 6121

Search for another bill or initiative:

## SB 6121 - 2023-24

Concerning biochar production from agricultural and forestry biomass.

**Revised for 1st Substitute:** Concerning agricultural and forestry biomass.

Sponsors: **Van De Wege, Nobles, Randall**

Companion Bill: **HB 2483**

### Bill Status-at-a-Glance ⓘ

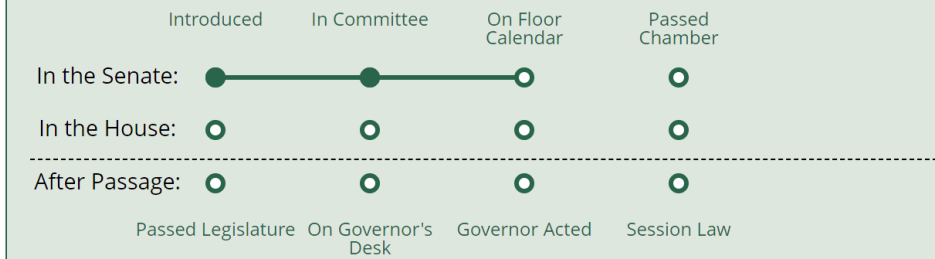
See **Bill History** for complete details on the bill

As of Saturday, February 10, 2024 11:59 PM

**Current Version:**  
SB 6121

**Current Status:**  
S2nd Reading

#### Where is it in the process?



# Which then became the Flame Capped Kiln bill



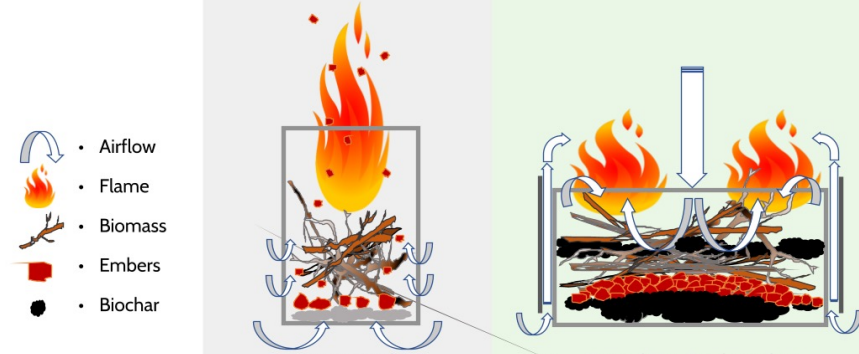


# Educational Materials are a MUST

Are Flame-cap Kilns the same as Burn Barrels? **NO.**

A quick explainer in support of SSB 6121

Six key differences to know about:	Burn Barrels	Flame-cap Kilns
#1 - What is the <b>intent</b> of use?	Get rid of <b>trash</b> and convert it to ash.	Create as much high quality <b>biochar</b> as possible. Biochar, in addition to sequestering carbon, is a high-value soil amendment.
#2 - What <b>inputs</b> are put into the vessel?	Typically <b>trash</b> - which could include anything, including plastics. This is a big part of why they're illegal.	<b>Clean biomass</b> from forestry or agricultural activity, such as wood, brush, and crop residue - the same materials that are regulated as part of legal open pile burning. There's a big incentive to use clean material that will positively impact the quality of the biochar.
#3 - What are typical <b>designs</b> of these vessels?	Tall & narrow, typically using a 55 gallon drum. Air holes around bottom and base.	Wider than tall, <b>purpose-built</b> for biochar production. <b>Completely sealed around the bottom</b> by soil or metal.
#4, 5 - What impacts do <b>air flow</b> and <b>flame caps</b> have on carbon sequestration, air quality, and emissions?	With <b>co-current</b> air flow, sparks and embers from incinerating trash rapidly move from the bottom, up and out of the burn barrel, thanks to the constant supply of fresh air through the bottom. Oxygen & carbon meet, join as CO <sub>2</sub> and escape with other <b>greenhouse gasses</b> like methane.	With <b>counter-current</b> air flow, the fire burns at the <b>top</b> of the kiln creating a <b>vortex</b> ; little oxygen makes its way inside. Low oxygen + high temperatures enable <b>pyrolysis</b> , where <b>durable biogenic carbon</b> manifests in <b>biochar</b> and collects at the bottom of the kiln. The <b>flame cap burns off combustibles</b> like methane, plus most smoke & embers resulting in a cleaner burn and lower emissions.
#6 - How does the <b>process end</b> ?	When the people doing the burn believe that the burn barrel is safe to leave. Spoiler alert: it's often still burning.	When the flames have subsided and hot coals remain, the biochar is <b>quenched with water to stop the burn</b> and then raked out to cool it quickly, <b>ensure there are no hot spots</b> , prevent the transition to ash, and maximize the volume of valuable biochar from the batch.



- Airflow
- Flame
- Biomass
- Embers
- Biochar

Illustrations courtesy of [wilsonbiochar.com](http://wilsonbiochar.com)

**Burn Barrel**  
Airflow and Flames – air from the bottom transports embers out of the barrel

**Ring of Fire Biochar Kiln®**  
Airflow and Flames – Counter-flow air from the top keeps embers contained and flame lengths low.

Let's get SSB 6121 to the Governor's desk!



# Democracy is NOT a spectator Sport

- Engage early and often
- Persevere
- Coalitions work!
  
- Next Steps
  - Try again for Charboss/Burnboss Technologies
  - EPA Rule Change on Air Curtain Incinerators?
  - Figure out the carbon credit opportunity



# Hay Burners and Hugel Beds are Better with Biochar ☺

## Thank you!



Elaine Oneil, PhD

Executive Director, Washington Farm Forestry Association

[eoneil@wafarmforestry.com](mailto:eoneil@wafarmforestry.com) 360-388-8033

