



**FOREST INDUSTRY
RESEARCH PROGRAM**
UNIVERSITY OF MONTANA

Timber Processing Capacity and Capability: Northeast Washington Collaborative Forest Landscape Restoration Project

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Introduction

The Northeast Washington Collaborative Forest Landscape Restoration Project (CFLRP) covers 916,283 acres dominated by lodgepole pine in the higher elevations and ponderosa pine in the urban interface (Colville National Forest, 2011). The CFLRP is primarily made up of national forest lands, including portions of the Colville and Okanogan national forests. Other land ownerships within the CFLRP boundary include private lands, Confederated Tribes of the Colville Reservation lands, and other public lands.

According to the Northeast Washington CFLRP 2021 Project Extension Proposal:

The overarching goals for the Vision 2020 project are to restore forests and habitats, reduce hazardous fuels, use woody biomass and small-diameter trees, and reduce the costs of treatments and wildfire management (Colville National Forest, 2021).

By the end of fiscal year 2020, the Northeast Washington CFLRP had awarded 415,783 hundred cubic feet (CCF) of timber. During the nine-year extension, the Northeast Washington CFLRP plans to harvest an additional 337,000 CCF of timber.

The Northeast Washington CFLRP contains portions of Ferry, Okanogan, and Stevens counties (figure 1). Those three Washington counties make up the “Study Area” in this report. The Study Area covers over 6.4 million acres. Analysis of timber flow indicates that timber harvested in the Northeast Washington Study Area is processed by facilities located inside and outside its boundaries. All counties that contain one or more facility that processes timber harvested in the Study Area constitute the “Timber Processing Area” or TPA. The TPA for the Northeast Washington CFLRP includes the three counties within the Study Area, as well as Pend Oreille, Skagit, and Snohomish counties in Washington and Benewah, Bonner, Boundary, Kootenai, and Latah counties in Idaho.

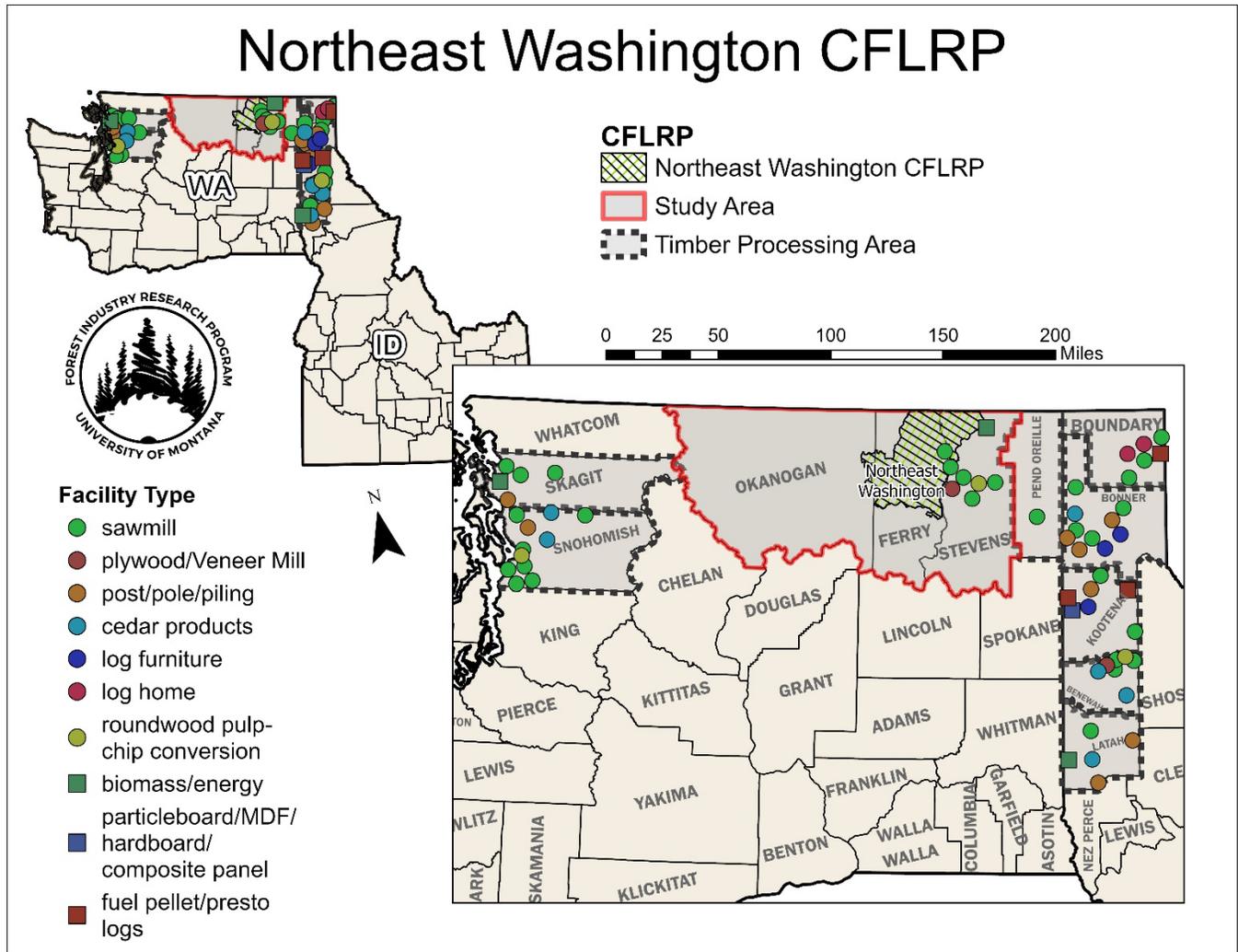
The data used to develop the information presented in this report were collected from timber-processing facilities by the University of Montana’s Forest Industry Research Program (FIRP) within the Bureau of Business and Economic Research. FIRP would like to thank the timber-processing facilities for their participation, without which, analyses such as this one would not be possible.

Previous reports on Washington’s timber harvests and timber-processing industry were done by the Washington State Department of Natural Resources and the data in this report from 2018 were collected by that agency. The 2020 data were collected and processed by FIRP under joint venture agreements with the USDA Forest Service’s Pacific Northwest Research Station as part of a periodic census of timber-processing facilities in Washington. Capacity and capability data for Idaho are from the 2023 census in that state.

FIRP makes every effort to identify and collect data from all commercial timber-processing facilities that buy logs and sell output products across the West. Hobbyists and timber processors that supply their own logs or saw for hire may not be included in FIRP’s database. If the reader identifies facilities in the TPA counties that are missing from this analysis, please let FIRP know.

Additional information from FIRP is available upon request; however, mill- or company-level data are confidential and will not be released.

Figure 1. The Northeast Washington CFLRP, Study Area, Timber Processing Area, and facilities.



There are 60 timber processing facilities in the Northeast Washington TPA, including 27 sawmills, 8 post/pole/piling facilities, 7 cedar products facilities, 3 roundwood pulp-chip conversion facilities, 3 fuel pellet/presto logs and briquette facilities, 3 biomass energy facilities, 3 log furniture facilities, 2 plywood mills, 2 log home facilities, 1 particleboard/MDF/hardboard facility, and 1 tone wood facility (table 1).

Table 1. Northeast Washington TPA timber-processing facilities.^a

Facility name	Facility type	State	County	Current Facility Status	Included in log-processing capacity analysis
Columbia Cedar, Inc.	Sawmill	WA	Ferry	Active	Yes
Vaagen Brothers Lumber--Usk sawmill	Sawmill	WA	Pend Oreille	Active	Yes
SPI - Mt Vernon Cogen	Biomass/energy	WA	Skagit	Active	No
Pacific Rim Tonewoods	Other primary manufacturer	WA	Skagit	Active	No
Bell Lumber and Pole - Longview	Post/pole/piling	WA	Skagit	Active	No
Iron Mountain Sawmill	Sawmill	WA	Skagit	Active	No
SPI - Mt Vernon	Sawmill	WA	Skagit	Active	Yes
Deer Creek Cedar Products	Cedar products	WA	Snohomish	Active	Yes
Miller Shingle Co.	Cedar products	WA	Snohomish	Active	No
Stella-Jones - Arlington	Post/pole/piling	WA	Snohomish	Active	Yes
Willis Enterprises - Everett	Roundwood pulp-chip conversion	WA	Snohomish	Active	Yes
AJ's Custom Portable Saw Mill	Sawmill	WA	Snohomish	Active	No
Beck Mill Company, Inc.	Sawmill	WA	Snohomish	Active	Yes
Buse Timber Sales, Inc.	Sawmill	WA	Snohomish	Active	Yes
Canyon Lumber Company	Sawmill	WA	Snohomish	Active	Yes
Fritch Forest Products	Sawmill	WA	Snohomish	Active	Yes
Hampton Lumber Mills - Darrington Division	Sawmill	WA	Snohomish	Active	Yes
Smith Street Mill	Sawmill	WA	Snohomish	Active	No
Kettle Falls Generating Station	Biomass/energy	WA	Stevens	Active	No
Boise Cascade - Kettle Falls Plywood	Plywood	WA	Stevens	Active	Yes
Vaagen Brothers Lumber - Colville Chipping	Roundwood pulp-chip conversion	WA	Stevens	Active	Yes
Boise Cascade - Arden Lumber Mill	Sawmill	WA	Stevens	Active	Yes
Boise Cascade - Kettle Falls lumber	Sawmill	WA	Stevens	Active	Yes
Vaagen Bros Lumber, Inc.	Sawmill	WA	Stevens	Active	Yes
Webley Lumber Co.	Sawmill	WA	Stevens	Active	No
American Cedar	Cedar products	ID	Benewah	Active	Yes
DLM Shake	Cedar products	ID	Benewah	Active	Yes
PotlatchDeltic--St. Maries (plywood)	Plywood	ID	Benewah	Active	Yes
Swan Lake Fiber	Roundwood pulp-chip conversion	ID	Benewah	Active	Yes
PotlatchDeltic--St Maries (lumber)	Sawmill	ID	Benewah	Active	Yes
Roland Timber Company	Sawmill	ID	Benewah	Active	Yes
Stimson Lumber Company (St. Maries)	Sawmill	ID	Benewah	Active	Yes
Barretts Busy B	Cedar products	ID	Bonner	Active	Yes
Johns Rough Cut	Log furniture	ID	Bonner	Inactive	Yes
Misty Mountain Furniture	Log furniture	ID	Bonner	Active	Yes
Bell Lumber and Pole	Post/pole/piling	ID	Bonner	Active	Yes
Panhandle Forest Products	Post/pole/piling	ID	Bonner	Active	Yes
Stella Jones - McFarland Cascade Sandpoint	Post/pole/piling	ID	Bonner	Active	Yes
Idaho Forest Group - Laclede	Sawmill	ID	Bonner	Active	Yes
Priest Lake Lumber Company, Inc.	Sawmill	ID	Bonner	Inactive	Yes
Specialty Beams	Sawmill	ID	Bonner	Active	Yes
Stimson Lumber Company (Priest River)	Sawmill	ID	Bonner	Active	Yes
Alta Forest Products LLC	Cedar products	ID	Boundary	Active	Yes
North Idaho Energy Logs, Inc.	Fuel pellet/presto log briquettes	ID	Boundary	Active	No
Caribou Creek Log & Timber	Log home	ID	Boundary	Active	Yes
Structures Unlimited, Inc.	Log home	ID	Boundary	Inactive	Yes
Idaho Forest Group - Moyie Springs	Sawmill	ID	Boundary	Active	Yes
Thick 'N' Thin Beams and Lumber	Sawmill	ID	Boundary	Active	Yes
Lignetics, Inc.	Fuel pellet/presto log briquettes	ID	Kootenai	Active	No
North Idaho Energy Logs, Inc	Fuel pellet/presto log briquettes	ID	Kootenai	Active	No
North Idaho Log Furniture Co.	Log furniture	ID	Kootenai	Active	Yes
Plummer Forest Products	Particleboard/MDF/hardboard	ID	Kootenai	Active	No
North Idaho Post and Pole	Post/pole/piling	ID	Kootenai	Active	Yes
Idaho Forest Group - Chilco	Sawmill	ID	Kootenai	Active	Yes
Whiteman Lumber Company, Inc.	Sawmill	ID	Kootenai	Active	Yes
University of Idaho Steam Plant	Biomass/energy	ID	Latah	Active	No
Idaho Cedar Sales LLC	Cedar products	ID	Latah	Active	Yes
Stella Jones	Post/pole/piling	ID	Latah	Active	Yes
Timber Works, Inc.	Post/pole/piling	ID	Latah	Active	Yes
Bennett Lumber Products - Princeton ID	Sawmill	ID	Latah	Active	Yes

^aThe highlighted facilities are not included in capacity calculations as BBER does not have the necessary capacity data for them.

Timber harvest within the Northeast Washington CFLRP Study Area

The total volume of timber harvested from the Northeast Washington Study Area and processed into commercial products in 2020 was estimated at 908,165 CCF or 381,424 thousand board feet (MBF), Scribner with 55 percent of the harvest coming from Stevens County, 34 percent coming from Ferry County, and 12 percent coming from Okanogan County (table 2). In 2018, 59 percent of the 587,992 CCF or 261,759 MBF, Scribner harvest was from Okanogan County.

Table 2. Timber harvested in the Northeast Washington Study Area, in thousand board feet, Scribner (MBF) and hundred cubic feet (CCF), 2018 and 2020.

Study Area	2018			2020		
	MBF	CCF	Percent	MBF	CCF	Percent
Ferry County	72,578	165,103	28%	130,829	308,434	34%
Okanogan County	34,836	77,509	13%	45,678	104,551	12%
Stevens County	154,345	345,379	59%	204,916	495,180	55%
Total	261,759	587,992	100%	381,424	908,165	100%

The majority of timber harvested in the Northeast Washington Study Area in 2018 and 2020 were saw logs, at 65 percent and 70 percent of the total harvest, respectively (table 3). Veneer logs made up 23 percent and 21 percent of the harvest in those years. Pulpwood made up 13 percent of the harvest in 2018 and 9 percent in 2020.

Table 3. Timber harvested by timber product type in the Northeast Washington Study Area, in thousand board feet, Scribner (MBF) and hundred cubic feet (CCF), 2018 and 2020.

Product	2018			2020		
	MBF	CCF	Percent	MBF	CCF	Percent
Saw log	166,490	380,462	65%	278,571	637,300	70%
Veneer log	72,539	132,588	23%	83,623	187,496	21%
Pulpwood log	22,730	74,942	13%	17,730	78,451	9%
Cedar log	-	-	0%	1,500	4,918	1%
Total	261,759	587,992	100%	381,424	908,165	100%

Douglas-fir constituted the majority of timber harvested within the Northeast Washington Study Area in 2018 and 2020, at 55 and 58 percent of the total harvest, respectively (table 4). In 2018, ponderosa pine made up 21 percent of the harvest and in 2020 made up 18 percent. Grand fir made up 8 percent of the harvest in 2018 and 10 percent in 2020.

Table 4. Timber harvest by species in the Northeast Washington Study Area, in thousand board feet, Scribner (MBF) and hundred cubic feet (CCF), 2018 and 2020.

Species	2018			2020		
	MBF	CCF	Percent	MBF	CCF	Percent
Grand fir	18,388	45,607	8%	37,547	90,595	10%
Subalpine fir	-	-	0%	63	135	0%
Western larch	9,430	17,236	3%	13,148	29,234	3%
Englemann spruce	3,300	8,186	1%	5,559	13,826	2%
Lodgepole pine	13,943	34,346	6%	17,755	44,580	5%
Western white pine	-	-	0%	312	666	0%
Ponderosa pine	53,172	122,037	21%	69,300	160,513	18%
Douglas-fir	148,296	325,660	55%	218,921	524,036	58%
Western redcedar	9,355	21,494	4%	11,728	28,587	3%
Western hemlock	5,875	13,425	2%	7,090	15,992	2%
Total	261,759	587,992	100%	381,424	908,165	100%

A majority of the timber harvested in the Northeast Washington Study Area in 2018 and 2020 was harvested on private and Tribal lands, at 66 and 67 percent of the total harvest, respectively (table 5). Harvests on national forest lands made up 26 percent in 2018 and 23 percent in 2020.

Table 5. Timber harvest by ownership in the Northeast Washington Study Area, in thousand board feet, Scribner (MBF) and hundred cubic feet (CCF), 2018 and 2020.

Ownership	2018			2020		
	MBF	CCF	Percent	MBF	CCF	Percent
Private and Tribal timberland	175,224	386,770	66%	256,260	606,299	67%
National forest	64,283	150,998	26%	86,623	207,147	23%
Other public	22,252	50,224	9%	38,541	94,719	10%
Total	261,759	587,992	100%	381,424	908,165	100%

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One hundred percent of timber harvested in the Northeast Washington Study Area in 2018 was harvested live (table 6). In 2020, 4 percent of the saw timber was harvested dead.

Table 6. Percentage of timber harvested live and dead in the Northeast Washington Study Area, 2018 and 2020.

Study Area	2018		2020	
	Live percent	Dead percent	Live percent	Dead percent
Sawlogs	100%	0%	96%	4%
Veneer log	100%	0%	100%	0%
Pulpwood log	100%	0%	100%	0%
Cedar log	0%	0%	100%	0%
Volume-weighted average	100%	0%	97%	3%

Timber-processing within the Northeast Washington Timber Processing Area

Of the 908,165 CCF (381,424 MBF, Scribner) of timber harvested in the Study Area in 2020, 42 percent was processed in the county of harvest (table 7). Thirty-one percent of the timber harvested in the Study Area was processed outside the county of harvest but else

where inside the Study Area. Other counties in the TPA processed 27 percent of the timber harvested in the Study Area in 2020.

Table 7. Processing location for timber harvested in the Northeast Washington Study Area, in thousand board feet, Scribner (MBF) and hundred cubic feet (CCF), 2021.

Study Area harvest	Processed within the county of harvest	Processed elsewhere within the Study Area	Processed outside Study Area and inside Timber Processing Area
Ferry County	1%	73%	25%
Okanogan County	0%	39%	20%
Stevens County	68%	2%	29%
Study Area harvest total	42%	31%	27%

Of the total volume of timber processed by the facilities in the Northeast Washington TPA, 27 percent was harvested from the Study Area and 44 percent was harvested elsewhere in the TPA (table 8).

Table 8. Origin of timber processed within the Northeast Washington TPA, in thousand board feet, Scribner (MBF) and hundred cubic feet (CCF); WA 2020 and ID 2023.

Origin of timber	Volume (MBF)	Volume (CCF)	Proportion of the total timber received
From Study Area	381,424	908,165	27%
From TPA outside Study Area	649,678	1,516,524	44%
From other Washington counties	167,639	400,708	12%
From other states	243,321	536,307	16%
From British Columbia, CA	24,021	53,631	2%
Total	1,466,083	3,415,335	100%

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Timber-processing capacity and capability

The purpose of this report is to provide the Northeast Washington CFLRP and its stakeholders with information on 1) The current use of timber by primary wood-processing facilities in the vicinity of the Northeast Washington CFLRP, and 2) The maximum amount of timber these facilities could economically use in their current configuration. This information is intended to help stakeholders understand the available milling capacity within the TPA.

The term “capacity” refers to the maximum total volume of timber that existing timber processors within the TPA could use annually, given firm market demand for products, sufficient raw material, and ordinary downtime for maintenance. Also known as “timber-processing capacity”, it is a measure of mills’ timber *input* capacity and is expressed in MBF, Scribner and CCF per year. Input capacity is a useful measure when attempting to express the capacity of multiple types of mills in a common unit of measure. It is estimated from production (output) capacity information provided by facilities. Estimates in this report include the capacity of active facilities as well as idle (inactive) facilities with equipment still in place. Facilities that are permanently closed are not included. This analysis focuses on facilities that exclusively use timber in round form, including sawmills and plywood mills, among others. Facilities that use a mix of roundwood and non-roundwood inputs, such as chips, sawdust, shavings, and bark (e.g., biomass facilities) are not included in this capacity analysis because the combination of roundwood and non-roundwood inputs can vary widely from year to year, potentially over- or under-estimating capacity and use of roundwood by substantial margins.

The term “capability” refers to the volume of trees of a certain size class (measured as diameter at breast height, or dbh) that existing timber processors can economically process annually. This report uses three dbh classes: <7”, 7 to 9.9”, and ≥10”. These size classes were chosen to focus analysis on the smallest log sizes that are merchantable in the western U.S. and that are often harvested in restoration treatments conducted on national forest lands. Some facilities are designed to operate using only trees of a given size class. Capability at these facilities is readily classified in just one of the size classes (e.g., plywood plants typically only use trees ≥10” dbh, and post manufacturers primarily use trees <10” dbh). Many facilities can and do use timber from a variety of size classes, especially sawmills, which often process logs that are larger than the smallest tree size they are capable of processing due to greater profitability. However, some mills that process larger logs are not capable of processing smaller-diameter timber due to the configuration of their equipment.

“Use” refers to the volume of timber, both in total and by tree dbh class, that facilities are currently processing.

Annual processing capacity, capability, and utilization

The estimated annual timber-processing capacity of facilities in the Northeast Washington TPA was 4,225,300 CCF or 1,798,683 MBF, Scribner (table 9). Of this volume, 68 percent (2,871,590 CCF or 1,263,480 MBF, Scribner) was in the ≥10” dbh size class, 28 percent (1,165,810 CCF or 475,170 MBF, Scribner) was in the 7-9.9” dbh size class and 4 percent was in the <7” dbh size class. As such, a large majority of the Northeast Washington TPA timber-processing capacity is for larger logs and facilities may not be able to process smaller ones, either due to their equipment or because such processing would have a profit margin too small to be economical.

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Table 9. Annual timber processing capacity and capability, by dbh size class, of facilities within the Northeast Washington TPA, in thousand board feet, Scribner (MBF) and hundred cubic feet (CCF); WA 2020 and ID 2023.

Tree dbh	Thousand board feet, Scribner (MBF)	Hundred cubic feet (CCF)	Percent
< 7 in.	60,033	187,900	4%
7 - 9.9 in.	475,170	1,165,810	28%
≥ 10 in.	1,263,480	2,871,590	68%
Total capacity	1,798,683	4,225,300	100%

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Timber-processing facilities in the Northeast Washington TPA used 73 percent of their timber-processing capacity (table 10). Bonner County had the highest utilization rate at 88 percent while Latah County had the lowest at 51 percent.

Table 10. Annual timber processing capacity and timber consumption by county group for facilities within the Northeast Washington TPA, in thousand board feet, Scribner (MBF) and hundred cubic feet (CCF); WA 2020 and ID 2023.

Timber Processing Area	-----Capacity to process timber-----		-----Actual timber consumption-----		Most recent utilization
	<i>Thousand board feet, Scribner</i>	<i>Hundred cubic feet (CCF)</i>	<i>Thousand board feet, Scribner</i>	<i>Hundred cubic feet (CCF)</i>	
Ferry, Pend Oreille and Stevens counties, WA	515,833	1,302,181	415,202	1,009,008	77%
Skagit and Snohomish counties, WA	515,747	1,229,049	318,404	763,393	62%
Benewah County, ID	205,635	458,906	182,060	375,090	82%
Bonner County, ID	170,430	372,428	150,402	326,272	88%
Boundary County, ID	134,203	286,434	99,435	212,203	74%
Kootenai County, ID	144,014	310,384	120,350	257,520	83%
Latah County, ID	112,820	265,913	60,612	134,466	51%
Northeast Washington total	1,798,682	4,225,295	1,346,464	3,077,953	73%

Benewah, Bonner, Boundary, and Kootenai County have overused their capability in the $\geq 10''$ dbh size class (table 11). This is likely due to facilities substituting larger logs for smaller ones whenever they are available as larger logs are more economical to process. The Skagit and Snohomish county group had the largest unused capacity for timber $\geq 10''$ dbh at 381,322 CCF while the Ferry, Pend Oreille, and Stevens county group has the largest unused capacity for the 7-9.9'' dbh size class at 233,423 CCF. Among the single counties, Kootenai County had the largest unused capacity for the $< 7''$ dbh size class.

Table 11. Annual timber processing capability and unused capability by county group for facilities within the Northeast Washington TPA, in hundred cubic feet (CCF); WA 2020 and ID 2023.

Timber Processing Area	Capability to process timber by dbh size class (CCF)			Unused capability to process timber by dbh size class (CCF)		
	$< 7''$ dbh	7-9.9'' dbh	$\geq 10''$ dbh	$< 7''$ dbh	7-9.9'' dbh	$\geq 10''$ dbh
Ferry, Pend Oreille and Stevens counties, WA	61,016	414,390	826,775	39,965	233,423	19,784
Skagit and Snohomish counties, WA	19,686	141,564	1,067,800	9,185	75,150	381,322
Benewah County, ID	28,797	146,576	283,533	28,797	127,740	(72,721)
Bonner County, ID	12,424	147,005	212,998	11,056	124,651	(89,551)
Boundary County, ID	28,326	128,578	129,530	28,326	54,638	(8,733)
Kootenai County, ID	32,360	134,831	143,192	32,360	118,495	(97,991)
Latah County, ID	5,290	52,864	207,759	4,066	41,751	85,630
Total	187,898	1,165,809	2,871,587	153,754	775,847	217,740

Timber use by facilities in the Northeast Washington TPA in the $\geq 10''$ dbh size class was at a rate 6.8 times greater than the rate of use of the 7-9.9'' dbh size class (table 12). The facilities in the TPA used timber in the 7-9.9'' dbh size class at a rate 11.4 times greater than the $< 7''$ dbh size class.

Table 12. Timber use, by dbh size class, for facilities within the Northeast Washington TPA, in thousand board feet, Scribner (MBF) and hundred cubic feet (CCF); WA 2020 and ID 2023.

Tree dbh	Thousand board feet, Scribner (MBF)	Hundred cubic feet (CCF)	Percent
< 7 in.	7,463	34,143	1%
7 - 9.9 in.	150,331	389,962	13%
≥ 10 in.	1,188,671	2,653,849	86%
Total timber use	1,346,464	3,077,954	100%

There was 1,147,341 (452,219 MBF, Scribner) of unused timber processing capacity in the Northeast Washington TPA, 68 percent of which was for trees 7-9.9'' dbh (table 13). The unused timber processing capacity in the $\geq 10''$ dbh and $< 7''$ dbh size classes was 19 percent and 13 percent, respectively.

Table 13. Unused timber processing capacity, by dbh size class, for facilities within the Northeast Washington TPA, in thousand board feet, Scribner (MBF) and hundred cubic feet (CCF); WA 2020 and ID 2023.

Tree dbh	Thousand board feet, Scribner (MBF)	Hundred cubic feet (CCF)	Percent
< 7 in.	52,570	153,754	13%
7 - 9.9 in.	324,839	775,847	68%
≥ 10 in.	74,809	217,740	19%
Total unused timber-processing	452,219	1,147,341	100%

Discussion

The capacity utilization levels presented in this report indicate that the forest products industry in the Northeast Washington TPA has capacity available to process an increased yield of timber resulting from mechanized fuels reduction (table 13). However, the size and quality of timber available, as well as prevailing market prices and the availability of qualified labor, also affect the level of capacity at which primary processors are able to operate and in what size class(es) capability is concentrated. Fuels reduction treatments frequently involve the harvesting of smaller-diameter timber, the profitability of which diminishes as tree diameter decreases (Stewart et al. 2004). Harvesting salvage (standing dead) timber can become similarly unprofitable, especially if logs are less than 10" dbh, due to the lower grade recovery for these logs (Fahey et al. 1986).

While some operators have configurations capable of accommodating the processing of both large and small logs, not all processors are able to do so. Processing a greater volume of logs from smaller trees, that typically yield lower recovery, could reduce profit margins to the point of a mill becoming unprofitable, especially in a weak lumber market.

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