Department of Natural Resources

Economic & Revenue Forecast

Fiscal Year 2021, Third Quarter
February 2021

Forecast Summary

Coronavirus pandemic Still overshadowing all of the normal constituent parts of the forecast is the COVID-19 pandemic. However, that will likely change in the next six months. Since the last forecast, the two prospective vaccines we discussed in the previous forecast have been approved and have more conclusively been shown to be extremely effective; a massive production and distribution effort has begun, with more than 20 million people fully vaccinated (around 6 percent of the population) and 65 million doses administered; and another very effective vaccine has just been approved. In recent days, more than 2 million people per day are being vaccinated.

Additionally, and perhaps most importantly in the short term, the number of new daily infections, hospital admissions and deaths have plummeted during the past month. The tremendous increase in cases we wrote about in the previous forecast grew from a low of 35,000 in September to average almost 250,000 new cases per day in early January. As of this writing, there are around 67,000 new cases per day. Although this is a large drop, it is still around the level of the previous wave of cases in summer 2020.

There is still a risk of another spike in cases. At least two new, more-contagious strains of the disease have emerged, and the current vaccines appear to be less effective against at least one of these. This suggests that right now, vaccine distribution and pandemic mitigation efforts in the U.S. are in a race against time to get enough people vaccinated before the new strains are established enough to cause another spike in cases.

Given the efficacy of the vaccines, as well as the lasting immunity for those who have already had the disease, it seems likely that a new spike would be only temporary, extending the COVID-19 constraints on the economy by a couple of months. So, it appears that the over-riding question of the pandemic has shifted from "if" it will be brought under control to "when". The Bloomberg Vaccine Tracker shows that with the vaccination rate in the U.S., 1.8 million per day on average at writing, it would take

about 7 months to vaccinate 75 percent of the population - about the level required for herd immunity. However, the vaccination rate is likely to increase to around 3 million per day and there are plausible estimates that around 28 percent of the population has already had the disease, meaning herd immunity will come much sooner. We expect that by the next forecast, in June, the coronavirus will be much less of an impediment to economic activity in the U.S, and may even be insignificant.

Although we don't expect the pandemic to be an active constraint on the economy, it is unclear how long the recovery from the economic fallout from the pandemic will take. Although the public health response of the U.S. was poor relative to other developed nations, the massive multiple fiscal stimuluses and monetary policy response appears to have been enough to mitigate the worst of the damage so that, at least as far as GDP is concerned, the US has fared relatively well. And importantly, personal income and savings *increased* in 2020. This means that U.S. consumers, as a whole, are flush with cash to spend when they are comfortable or able to spend it.

Additionally, the new $1.9 trillion fiscal stimulus before Congress will likely spur a recovery and the Fed has been very clear that it will maintain a very accommodative monetary policy stance until there is full employment *and* sustained inflation averaging 2 percent. However, there is still much to rebuild. Many small businesses have closed and the headline unemployment rate is 6 percent, though a more realistic unemployment rate, that includes people who have left the job market is around 11 percent.

Overall, the outlook is much more optimistic this forecast than the one just a couple of months ago.

Lumber and Log Prices. Lumber prices in the latter half of 2020 were extraordinarily high. Through March 2020, lumber prices had been climbing and peaked at $478/mbf, but crashed to $363/mbf in May. From May, prices rebounded dramatically, peaking at $1,000/mbf in September. Prices fell back to $623/mbf in November before rebounding to $984 in January—higher in real terms than any

other point since before 2000.

The high lumber prices have pulled up log prices, with the price of a 'typical' DNR log rising from a low of $498 in April 2020, to peak at $711/mbf in October. In January, the price was $692, higher than has been seen since the spike in prices in 2018.

Early in the pandemic, we, and others, expected the pandemic to undermine house prices and demand, and, consequently, the demand for lumber. This widely shared expectation resulted in slower production at mills, furloughs, layoffs, and some mill closures. However, it appears that the very low interest rates have spurred housing demand and starts, and remodeling and renovation demand has also spiked during stay-at-home orders. The result was a sharp drop in supply while there is strong demand, making lumber prices rocket up and pushing up log prices. Prices are expected to remain high in the first quarter of 2021, before pulling back throughout the year, though the average for the year will remain higher than the 2020 average.

Timber Sales Volume. DNR plans to offer around 560 mmbf for sale in FY 21. We are leaving our sales volume forecast unchanged at 520 mmbf to take account for the risk of no-bids or pulled sales. Forecast sales volumes in future years are also unchanged.

Timber Sales Prices. Sales prices throughout FY 21 have been consistently high, with every sale being above the five-year average of $340/mbf, and many of them well above. We are increasing the sales price forecast for FY 21 to $380/mbf— from $300/mbf in the June 2020 forecast, $320 in September, and $340 in November. This is due to the both the strong log and lumber prices that we've seen and their continued strong outlook. With an updated February auction price, received as this was being written, this forecast price is likely too low.

Timber Removal Volume and Prices. The removal volume in FY 21 is decreased by 10 mmbf to 500 mmbf. To-date, harvest volumes have been much less than we had expected. It appears that the 2020 wildfires in Oregon created an enormous amount of salvage timber that must be harvested within a year before it becomes useless. The salvage effort has apparently tied up much of the log hauling capacity, pushing down harvests in Washington State.

The removal volume forecast is unchanged in outlying years.

The average price of timber harvested to date in FY 21 has remained high, and there is still a decent amount of timber due to expire this fiscal year that has high prices. This has motivated us to increase the forecast average removal price for FY 21 by $6/mbf to $331/mbf. Removal prices in outlying years are increased as well, based on higher sales prices in FY 21.

Timber Revenue. Forecast timber revenue in FY 21 is decreased slightly by $0.2 million to $165 million. FYs 22 and 23 are increased, by $9 million and $6 million respectively.

Forecast timber revenues for the 2019-2021 biennium are unchanged at $347 million, while revenues for the 2021-2023 biennium are increased by $15 million to $360 million.

Non-Timber Revenues. In addition to revenue from timber removals on state-managed lands, DNR also generates sizable revenues from managing leases on uplands and aquatic lands.

The non-timber uplands revenue forecasts are increased by $0.7 million in FY 21 due to additional revenue from back rent in communications leases and much higher than expected revenue in other leases, which includes a variety of smaller revenue sources.

The aquatic lease revenue forecast for FY 21 is decreased due to much lower non-water-dependent revenue offsetting small improvements in revenue in aquaculture and easements.

The forecast geoduck revenue has been slightly increased for FYs 21-23 due to better than expected prices in recent auctions. However, it has been decreased in FYs 24 and 25. Previously, we had built in an increase in prices due to 'normalization' of relations between China and the U.S., seeing the elimination of the tariffs on geoduck. However, it

doesn't appear that the new U.S. administration is any more inclined to reduce tariffs or the trade-war than the previous. The geoduck revenue forecast is based on an assumed harvest volume of 85 percent of sales through the first half of CY 2021.

Aside from the COVID-19 pandemic, there remains a trade war between the U.S. and China, with high tariffs on geoduck. These are expected to continue indefinitely, limiting Chinese consumption and continuing to push Chinese consumers toward other luxury seafood.

Total Revenues. Forecast revenues for the 2019-2021 Biennium (FYs 20 and 21) are essentially unchanged at $480 million. Revenues for the 2021-2023 Biennium are increased by 3.4 percent ($16 million) to $499 million.

Other notes to the Forecast. In addition the possibility of a COVID-19 resurgence, a number of sources of uncertainty may affect DNR revenue specifically, and the overall economic activity more broadly. These include: legal challenges to the sustainable harvest volume and marbled murrelet conservation strategy; uncertainty about the type and quality of stumpage DNR is able to bring to market more than six months out; the ongoing trade war and political tension with China directly affecting timber and agricultural exports and prices; and uncertainty about the stability of the current high housing starts level. Additionally, while the timber sales volume estimates are based on the best available internal planning data, they are subject to adjustments due to ongoing operational and policy issues.

From the beginning of 2018 until just before the COVID-19 pandemic, the U.S. and China engaged in an escalating trade dispute. Prior to the pandemic, the tariffs on geoduck were 25 percent and were a significant driver of the drop in geoduck prices in late 2019. The log tariffs and a slowdown in housing starts were the major contributors to the lower domestic price of logs through late 2019. With the pandemic, tariffs were reduced to 5 percent tariff on geoduck, wheat, and softwood logs. There's no indication that tariffs between the countries will be reduced or removed soon.

In addition to the coronavirus and the trade tensions discussed above, other things could undermine Chinese demand, such as continued loss of Pacific Northwest market share to international and Southeastern U.S. competitors.

As always in the geoduck fisheries, PSP closures create uncertainty around harvest volumes as well.

Table 1: February 2021 Forecast by Source (millions of dollars)

Timber Sales		FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25
Volume (mmbf)		496	488	534	520	500	500	500	500
	Change				-	-	-	-	-
	% Change				0%	0%	0%	0%	0%
Price ($/mbf)		458	325	291	380	340	340	340	340
	Change				$ 40	$ -	$ -	$ -	$ -
	% Change				12%	0%	0%	0%	0%
Value of Timber Sales		**227.1**	**158.8**	**155.3**	**197.6**	**170.0**	**170.0**	**170.0**	**170.0**
	Change				$ 20.8	$ -	$ -	$ -	$ -
	% Change				12%	0%	0%	0%	0%
Timber Removals									
Volume (mmbf)		528	502	527	500	520	520	509	500
	Change				(10)	0	0	(0)	-
	% Change				-2%	0%	0%	0%	0%
Price ($/mbf)		338	385	345	331	345	347	342	340
	Change				5.9	17.2	10.6	1.6	-
	% Change				2%	5%	3%	0%	0%
Timber Revenue		**178.6**	**193.3**	**181.7**	**165.3**	**179.2**	**180.6**	**174.0**	**170.0**
	Change				(0.2)	9.0	5.5	0.7	-
	% Change				0%	5%	3%	0%	0%
Upland Leases									
Irrigated Agriculture		10.4	8.9	9.0	9.0	9.0	9.0	9.0	9.0
	Change				-	-	-	-	-
	% Change				0%	0%	0%	0%	0%
Orchard/Vineyard		8.5	9.0	8.8	8.2	8.2	8.2	8.2	8.2
	Change				-	-	-	-	-
	% Change				0%	0%	0%	0%	0%
Dryland Ag/Grazing		6.6	6.6	6.2	5.7	6.0	6.0	6.0	6.0
	Change				-	-	-	-	-
	% Change				0%	0%	0%	0%	0%
Commercial		10.9	10.2	10.3	10.4	10.8	10.8	10.8	10.8
	Change				-	-	-	-	-
	% Change				0%	0%	0%	0%	0%
Other Leases		9.8	10.0	10.0	11.1	10.1	10.2	10.2	10.3
	Change				0.7	-	-	-	-
	% Change				7%	0%	0%	0%	0%
Total Upland Leases		**46.1**	**44.6**	**44.3**	**44.4**	**44.1**	**44.2**	**44.2**	**44.3**
	Change				0.7	-	-	-	-
	% Change				2%	0%	0%	0%	0%
Aquatic Lands									
Aquatic Leases		12.0	13.5	12.7	10.9	12.4	12.4	12.4	12.4
	Change				(0.8)	-	-	-	-
	% Change				-7%	0%	0%	0%	0%
Geoduck		26.4	23.6	10.6	10.8	12.7	13.4	13.3	13.3
	Change				0.5	1.2	0.7	(1.2)	(1.5)
	% Change				5%	10%	6%	-8%	-10%
Aquatic Lands Revenue		**38.4**	**37.1**	**23.4**	**21.7**	**25.1**	**25.8**	**25.7**	**25.7**
	Change				(0.3)	1.2	0.7	(1.2)	(1.5)
	% Change				-1%	5%	3%	-4%	-6%
Total All Sources		**263.1**	**275.0**	**249.4**	**231.4**	**248.3**	**250.6**	**243.8**	**240.0**
	Change				0.2	10.2	6.2	(0.5)	(1.5)
	% Change				0%	4%	3%	0%	-1%

Table 2: February 2021 Forecast by Fund (millions of dollars)

Key DNR Operating Funds		FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25
041	RMCA - Uplands	40.6	39.9	33.5	32.4	38.4	40.4	39.7	39.1
	Change				(1.3)	0.9	0.9	0.1	-
	% Change				-4%	2%	2%	0%	0%
041	RMCA - Aquatic Lands	17.6	16.7	9.9	9.2	10.7	11.0	11.0	11.0
	Change				(0.0)	0.6	0.4	(0.6)	(0.8)
	% Change				0%	6%	3%	-5%	-6%
014	FDA	22.1	25.6	28.3	23.2	22.6	22.2	21.2	20.8
	Change				1.0	1.3	0.8	0.1	-
	% Change				5%	6%	4%	0%	0%
21Q	Forest Health Revolving	4.4	6.5	7.9	13.3	10.8	8.7	8.4	8.0
					1.8	0.8	(0.2)	0.1	-
					16%	8%	-2%	2%	0%
Total DNR Key Operating Funds		**84.7**	**88.7**	**79.7**	**78.2**	**82.5**	**82.3**	**80.3**	**78.9**
	Change		-		1.5	3.7	1.8	(0.3)	(0.8)
	% Change				2%	5%	2%	0%	-1%

Current Funds									
113	Common School Construction	62.6	64.2	59.5	51.9	61.7	66.3	65.6	64.8
	Change				(2.7)	0.6	1.2	0.1	-
	% Change				-5%	1%	2%	0%	0%
999	Forest Board Counties	59.6	69.5	68.7	57.3	55.4	54.5	52.1	51.0
	Change				2.9	3.1	1.8	0.2	-
	% Change				5%	6%	3%	0%	0%
001	General Fund	2.1	1.9	4.7	4.7	3.9	3.6	3.4	3.3
	Change				0.3	0.2	0.1	0.0	-
	% Change				6%	5%	3%	0%	0%
348	University Bond Retirement	3.2	1.3	0.6	1.8	1.9	2.0	2.0	1.9
	Change				(0.2)	0.1	0.1	0.0	-
	% Change				-8%	3%	3%	0%	0%
347	WSU Bond Retirement	1.6	1.4	1.9	1.7	1.7	1.7	1.7	1.7
	Change				0.0	-	-	-	-
	% Change				2%	0%	0%	0%	0%
042	CEP&RI	5.3	2.7	3.6	1.9	3.4	4.1	4.1	4.1
	Change				(0.1)	0.1	0.1	0.0	-
	% Change				-3%	3%	3%	0%	0%
036	Capitol Building Construction	6.2	9.8	4.4	7.7	8.4	7.9	7.5	7.3
	Change				0.1	0.3	0.2	0.0	-
	% Change				2%	4%	3%	0%	0%
061/3/5/6	Normal (CWU, EWU, WWU, TESC) School	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	Change				0.0	-	-	-	-
	% Change				3%	0%	0%	0%	0%
Other Funds		1.1	1.2	1.1	0.4	0.2	0.2	0.1	0.1
	Change				(0.3)	0.0	0.0	0.0	-
	% Change				-41%	5%	0%	0%	0%
Total Current Funds		**141.7**	**152.1**	**144.7**	**127.6**	**136.7**	**140.4**	**136.8**	**134.5**
	Change				0.1	4.4	3.5	0.4	-
	% Change				0%	3%	3%	0%	0%

(Continued)

Table 3: February 2021 Forecast by Fund (millions of dollars), cont'd

Aquatic Lands Enhancement Account			FY 18	FY 19	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25
02R			20.8	20.4	13.5	12.5	14.4	14.8	14.7	14.7
		Change				(0.3)	0.6	0.4	(0.6)	(0.8)
		% Change				-2%	4%	2%	-4%	-5%
Permanent Funds										
	601	Agricultural College Permanent	4.2	4.1	5.4	4.8	5.3	4.4	3.9	3.8
		Change				(1.0)	0.6	0.2	0.0	-
		% Change				-18%	12%	4%	0%	0%
	604	Normal School Permanent	4.1	2.9	2.6	2.5	2.7	2.8	2.7	2.6
		Change				(0.2)	(0.0)	0.0	0.0	-
		% Change				-6%	-1%	2%	0%	0%
	605	Common School Permanent	0.8	0.2	0.2	0.3	0.3	0.3	0.3	0.3
		Change				-	-	-	-	-
		% Change				0%	0%	0%	0%	0%
	606	Scientific Permanent	7.0	5.4	3.1	5.1	5.8	5.1	4.6	4.5
		Change				0.1	1.0	0.3	0.0	-
		% Change				2%	21%	7%	0%	0%
	607	University Permanent	0.3	0.7	0.1	0.4	0.5	0.5	0.5	0.5
		Change				(0.0)	(0.0)	0.0	0.0	-
		% Change				-1%	-5%	1%	0%	0%
Total Permanent Funds			16.5	13.3	11.4	13.2	14.7	13.1	12.1	11.8
		Change				(1.1)	1.5	0.5	0.0	-
		% Change				-8%	12%	4%	0%	0%
Total All Funds			263.7	274.4	249.4	231.4	248.3	250.6	243.8	240.0
		Change				0.2	10.2	6.2	(0.5)	(1.5)
		% Change				0%	4%	3%	0%	-1%

Figure 1: Timber Forecast Charts
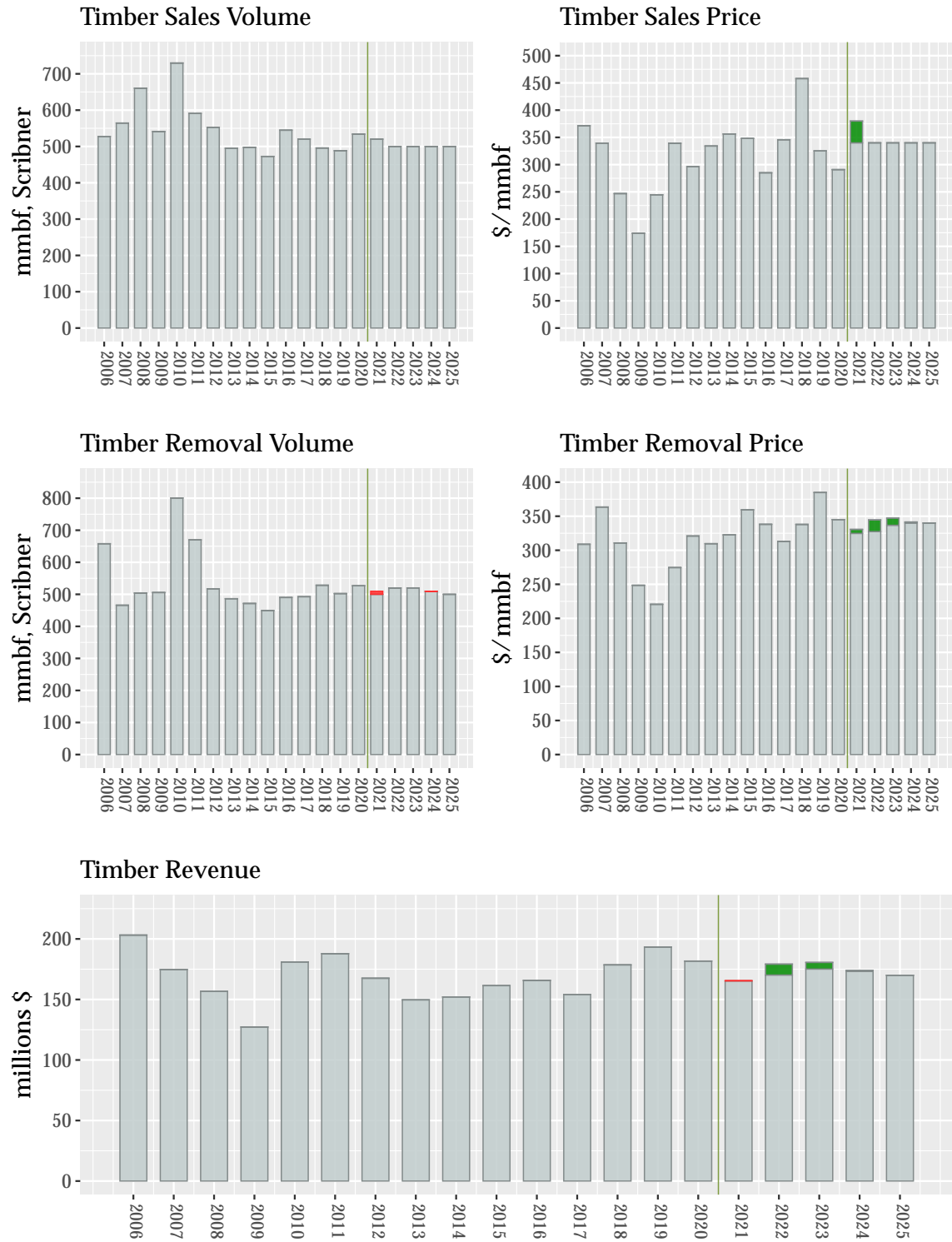
Figure 2: Other Uplands Forecast Charts
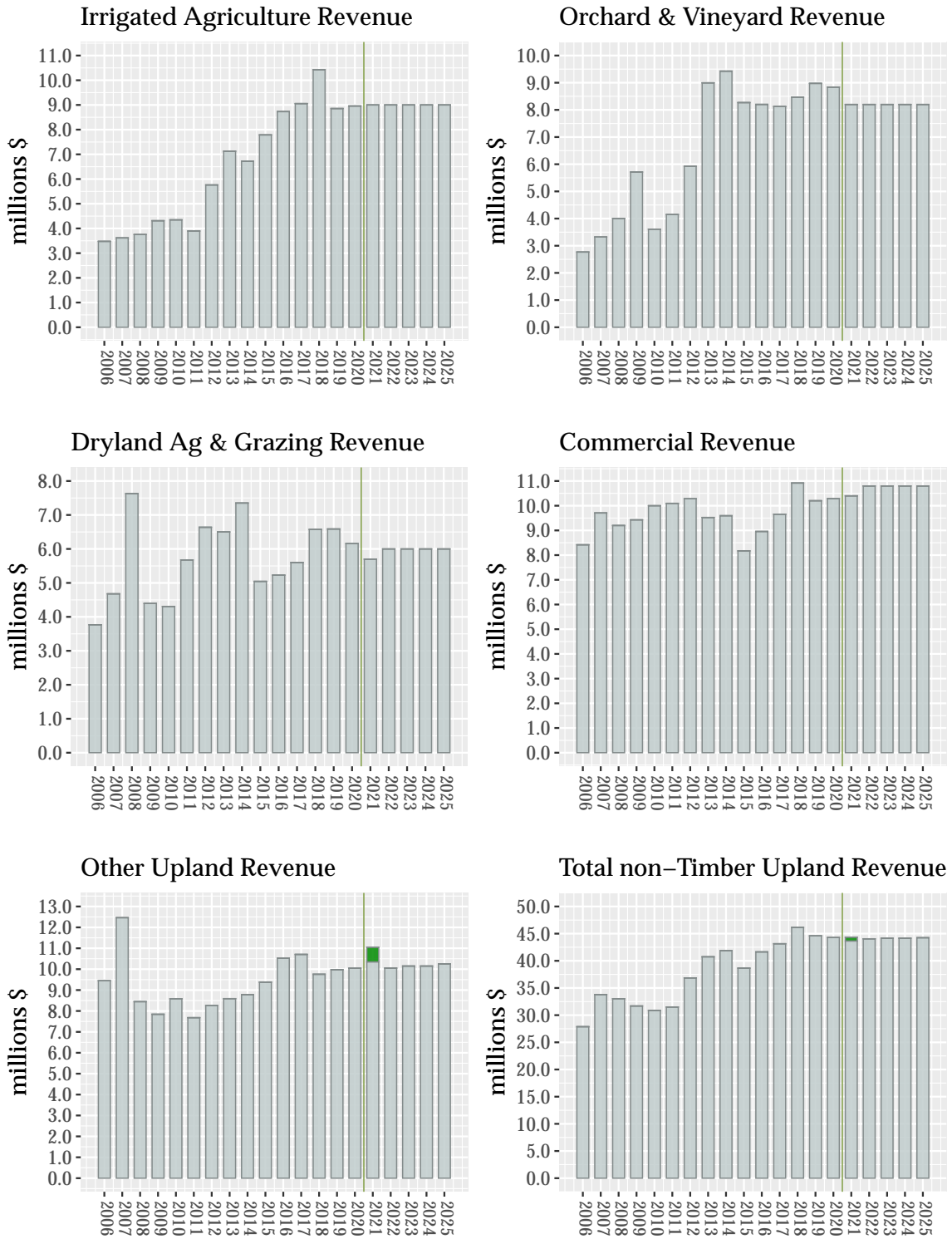
Figure 3: Aquatics and Total Forecast Charts

Aquatic Lease Revenue

Geoduck Revenue

Total Aquatics Revenue

Total Revenue

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Acronyms and Abbreviations

bbf   Billion board feet
BLS   U.S. Bureau of Labor Statistics
CAD   Canadian dollar
CNY   Chinese yuan (renminbi)
CPI   Consumer Price Index
CY   Calendar Year

DNR   Washington State Department of Natural Resources
ECB   European Central Bank
ERFC   Washington State Economic and Revenue Forecast Council
FDA   Forest Development Account
FEA   Forest Economic Advisors
Fed   U.S. Federal Reserve Board

FOMC   Federal Open Market Committee
FY   Fiscal Year
GDP   Gross domestic product
HMI   National Association of Home Builders/Wells Fargo Housing Market Index
IMF   International Monetary Fund
ITC   U.S. International Trade Commission

mbf   Thousand board feet
mmbf   Million board feet
PSP   Paralytic shellfish poisoning
PPI   Producer Price Index
Q1   First quarter of year (similarly, Q2, Q3, and Q4)
QE   Quantitative easing

RCW   Revised Code of Washington
RMCA   Resource Management Cost Account
SA   Seasonally adjusted
SAAR   Seasonally adjusted annual rate
SLA   Softwood Lumber Agreement

TAC   Total allowable catch
USD   U.S. dollar
WDFW   Washington Department of Fish and Wildlife
WWPA   Western Wood Products Association
WTO   World Trade Organization

Preface

This *Economic and Revenue Forecast* projects revenues from Washington state lands managed by the Washington State Department of Natural Resources (DNR). These revenues are distributed to management funds and beneficiary accounts as directed by statute.

DNR revises its Forecast quarterly to provide updated information for trust beneficiaries and state and department budgeting purposes. Each DNR Forecast builds on the previous one, emphasizing ongoing changes. Forecasts re-evaluate world and national macroeconomic conditions, and the demand and supply for forest products and other goods. Finally, each Forecast assesses the impact of these economic conditions on projected revenues from DNR-managed lands.

DNR Forecasts provide information used in the *Washington Economic and Revenue Forecast* issued by the Washington State Economic and Revenue Forecast Council. The release dates for DNR Forecasts are influenced by the state's forecast schedule as prescribed by RCW 82.33.020. The table below shows the anticipated schedule for future *Economic and Revenue Forecasts.*

This Forecast covers fiscal years 2021 through 2025. Fiscal years for Washington State government begin July 1 and end June 30. For example, the current fiscal year, Fiscal Year 2021, runs from July 1, 2020, through June 30, 2021.

The baseline date (the point that designates the transition from "actuals" to predictions) for DNR revenues in this Forecast is January 1, 2021. The forecast numbers beyond that date are predicted from the most up-to-date DNR sales and revenue data available, including DNR's timber sales results through February 2021. Macroeconomic and market outlook data and trends are the most up-to-date available as the Forecast document is being written.

Unless otherwise indicated, values are expressed in nominal terms without adjustment for inflation or seasonality. Therefore, interpreting trends in the Forecast requires attention to inflationary changes in the value of money over time, separate from changes attributable to other economic influences.

Economic Forecast Calendar

Forecast	Baseline Date	Final Data and Publication Date (approximate)
June 2021	May 1, 2021	June 15, 2021
September 2021	August 1, 2021	September 15, 2021
November 2021	October 1, 2021	November 15, 2021
February 2022	January 1, 2022	February 15, 2022

Acknowledgements

Macroeconomic Conditions

This section briefly reviews macroeconomic conditions in the United States and world economies because they influence DNR revenue—most notably through the bid prices for DNR timber and geoduck auctions and lease revenues from managed lands.

COVID-19 Pandemic

Still overshadowing all of the normal constituent parts of the forecast is the COVID-19 pandemic. However, that will likely change in the next six months. Since the last forecast, the two prospective vaccines we discussed in the previous forecast have been approved and have more conclusively shown to be extremely effective; a massive production and distribution effort has begun, with more than 20 million people fully vaccinated (around 6 percent of the population) and 65 million doses administered; and another very effective vaccine has just been approved. In recent days, more than 2 million people per day have vaccinated.

Additionally, and perhaps most importantly in the short term, the number of new daily infections, hospital admissions and deaths have plummeted in the past month. The tremendous increase in cases we wrote about in the previous forecast grew from a low of 35,000 in September to average almost 250,000 new cases per day in early January. As of this writing, there are around 67,000 new cases per day. Although this is a large drop, this is still the level of the previous wave of cases in summer 2020.

There is still a risk of another spike in cases. At least two new, more-contagious strains of the disease have emerged, and the current vaccines appear to be less effective against at least one of these. This suggests that right now, vaccine distribution and pandemic mitigation efforts in the U.S. are in a race against time to get enough people vaccinated before the new strains are established enough to cause another spike in cases. Unfortunately, with the politicization of the disease, some states are relaxing their mitigation efforts against the advice of the Centers for Disease Control and Prevention.

This creates a risk of further spikes in the virus and increases the risk of mutations.

Given the efficacy of the vaccines, as well as the lasting immunity for those who have already had the disease, it seems likely that a new spike would be only temporary, extending the COVID-19 constraints on the economy by a couple of months. So, it appears that the question of the pandemic has shifted from "if" it will be brought under control to "when." The Bloomberg Vaccine Tracker shows that with the vaccination rate in the U.S., 1.8 million per day on average at writing, it would take about 7 months to vaccinate 75 percent of the population - about the level required for herd immunity. However, the vaccination rate is likely to increase to around 3 million per day and there are plausible estimates that around 28 percent of the population has already had the disease—meaning that herd immunity will come much sooner. We expect that by the next forecast, in June, the coronavirus will be much less of an impediment to economic activity in the U.S, and may even be insignificant.

Our expectations in this forecast are that emerging new variants of COVID-19 will not be resistant to the vaccines.

The novel coronavirus pandemic has caused economic mayhem. Initially, it created the steepest and most sudden drop in employment (moving the unemployment rate from 3.5 percent in February to 14.7 percent in April) and economic activity (with GDP dropping -9.6 percent, or -33.3 percent real SAAR) in US history as the virus spread through the country and led almost every state to initiate some type of stay-at-home or social-distancing order, closing schools and many businesses. Since then, the U.S. economy has seen a large rebound, though a full recovery is likely to take much longer.

It unclear how long the economic fallout from the pandemic will take to recover from. Although the public health response of the U.S. was poor relative to other developed nations, the massive multiple fiscal stimuluses and monetary policy response appears to have been enough to mitigate the worst of the damage so that, at least as far as GDP is concerned, the US has fared relatively well. And more importantly, personal income and savings *in-*

creased in 2020. This means that U.S. consumers, as a whole, are flush with cash to spend when they are comfortable or able to spend it.

Additionally, the new $1.9 trillion fiscal stimulus before Congress will likely spur a recovery. However, there is still much to rebuild. Many small businesses have closed and the headline unemployment rate is 6 percent. A more realistic unemployment rate that includes people who have left the job market is around 11 percent.

In addition to the real health and economic problems that the pandemic has caused, the suddenness of the changes have increased the difficulty of economic modeling. Broadly, economic models rely on historical data to try to forecast or understand how the future will look. And most economic data that feed into these models is delayed by at least a month, and often longer. The suddenness and severity of the coronavirus impacts mean that economic models are operating well outside of their historical bounds. This causes "out of sample" or "generalization" errors—the current data is just so far outside of the normal bounds that the models become ever more inaccurate.

These difficulties with economic modeling mean that it is even more difficult than normal to predict where the economy will be, even in the near future.

Overall, though there are meaningful uncertainties, the outlook is much more optimistic this forecast than the one just a couple of months ago. The pandemic is likely to be brought under control soon and the large fiscal stimulus will likely spur spending and growth as things return to more normal.

U.S. Economy

Gross Domestic Product

Typically, GDP is a useful indicator of how the U.S. economy is growing overall. When GDP is growing well, then generally there will be an increase in jobs, spending, and overall economic welfare. This often includes growth in housing spending and construction, which influences timber prices and DNR's
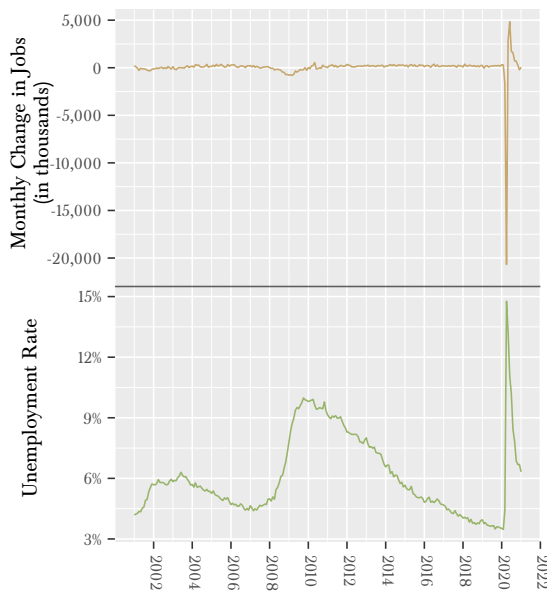
income from timber. It is a useful indicator of how other, more directly relevant indicators, may move in the future.

Figure 4: U.S. Gross Domestic Product
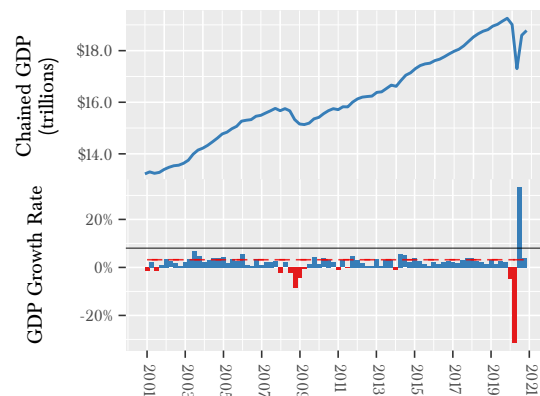
The COVID-19 pandemic caused the sharpest quarterly GDP decline in history, first -0.86 percent in Q1 and then a staggering -9.62 percent in Q2 (-31.4 percent SAAR). However, it has rebounded with growth of 33.4 (SAAR) percent in Q3 and 4.0 percent (SAAR) in Q4 . Although this is a large rebound, it leaves real Q4 GDP 2.5 percent lower than 2019 Q4 GDP—roughly what it was in Q3 2018 (Figure 4).

Figure 5: Unemployment Rate and Monthly Change in Jobs

GDP at about what it was at the end of 2019.

Current high-frequency forecasts, such as the Atlanta Fed's GDPNow and the New York Fed's Nowcast, predict Q1 2021 GDP growth of between 8.7-10.0 percent (SAAR).

Employment and Wages

The labor market is the driving force behind consumption, which typically constitutes about 70 percent of GDP and naturally extends to the demand for housing, the major driver of U.S. timber demand. The U.S. headline unemployment rate measures the number of people looking for work as a percentage of the number of people in the labor force. It had been trending downward since peaking at 10 percent in 2010 and was 3.5 percent in February, one of its lowest points since 1969 (Figure 5).

In the previous forecast, we worried that the then-current resurgence of COVID-19 and a lack of stimulus at the federal level will seriously undermine the economic recovery in the 2021. However, there was an additional stimulus passed in December and, as previously mentioned, the spike is new COVID-19 cases has fallen dramatically. Additionally, another, very large, stimulus was just signed into law.

Typically, GDP growth rebounds after a recession, spiking to well above the historical average. This didn't happen with the Great Recession in 2008-09, but with the stimulus and the drop in COVID-19 cases, near-term economic growth is likely to be quite strong. Continuing to see the Q3 rebound growth rate of 30+ percent is unrealistic, but seeing the Q4 growth of around 4 percent is not.

Overall, GDP fell by 3.5 percent in 2020. In their December forecast, the FOMC projected that GDP would grow by between 3.7 and 5.0 percent in 2021, with a median estimate of 4.2 percent—up slightly from their September forecast. These growth rates in 2021 would be the highest annual GDP growth since before the Great Recession and would leave

With the shutdown of the economy, the unemployment rate shot up to 14.7 percent in April 2020, the highest it has been since the Great Depression. However, it has rebounded, dropping sharply to 6.9 percent in October 2020, which is still very high historically but also a dramatic improvement. Since then, it has inched down to 6.3 percent in January. Additionally, the labor force participation rate—that is, the percentage of the working age population that is in the labor force—decreased substantially from 63.4 percent in February to 60.2 percent in April. It, too, rebounded to 61.7 percent in October, but has decreased slightly since then.

Overall, this means that, despite the rebound, there are around 8 million fewer jobs in January 2021 than in February 2020 and about 4 million fewer people in the labor force (that is, employed or looking for work).

Figure 6: Employment and Unemployment
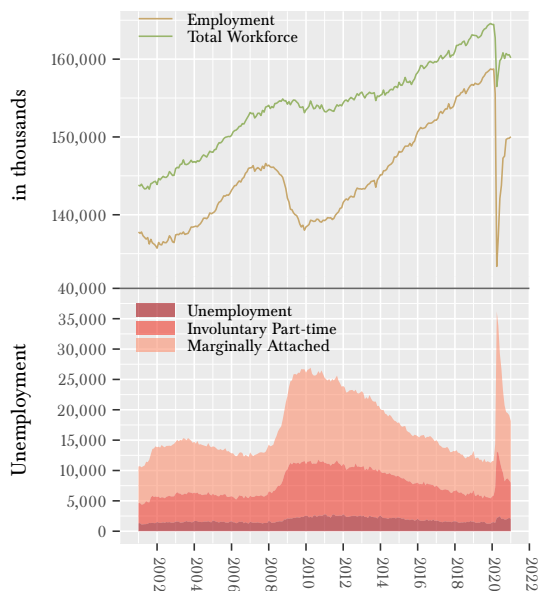
ballooned from a low of 939,000 in April, to 4.0 million in January. Another metric of this is continued unemployment claims—a measure of the number of people who have continued to file unemployment insurance claims after their initial claim. During the Great Recession continued claims peaked at 6.6 million in 2009. The most recent week's estimate on February 13, 2021, is continued claims of 4.4 million, down from 6.8 million in November. This is well below the recent peak of 24.9 million in May 2020, but is still quite high historically.

Finally, the U-6 is an alternative measure of unemployment that includes involuntarily part-time employment (underemployment) and marginally attached workers, who are not included in the headline unemployment rate but who, nevertheless, are likely to be looking for work and would benefit from better job prospects. The U-6 has also ballooned since February, increasing from 7.0 percent to 22.8 percent in April. Since then, it has fallen to 11.1 percent in January (Figure 6).

The speed of job re-growth has slowed considerably—dropping from a high of 4.8 million new (or re-created) jobs in June to 638,000 in October and 49,000 in January. Job growth will need to be considerably higher than that to regain all of the lost jobs. For instance, although the October growth of 638,000 jobs is much higher than the average 202,000 per month since 2013, it would take 16 months for the U.S to return to February 2020's employment at that rate.

It is unclear what job growth in the near future will look like. It is likely to be relatively strong with fewer pandemic restrictions and the economic stimulus. But it will likely take some time for some businesses to reopen and work to begin, and many small businesses will not reopen at all. Many of the easy job gains have likely already happened. The FOMC forecast is for the 2021 unemployment rate to be between 4.7-5.4 percent, with a median of 5.0 percent.

Another way to get insight into the unemployment situation is to look at how many people have been unemployed for a long period of time. The number of long-term (27 weeks or longer) unemployed has

Figure 7: Labor Market Indicators
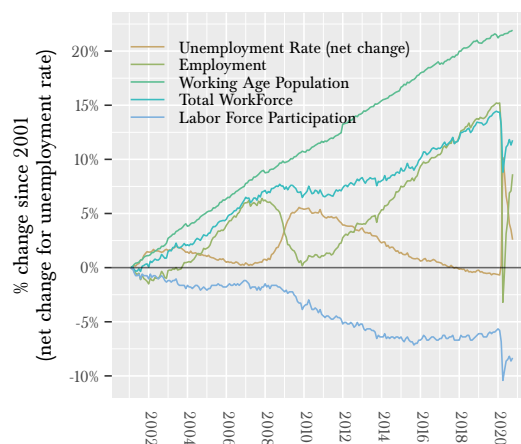
Inflation

Aside from a short period in 2012, core inflation has been below the FOMC's target since the recession in 2008. Similarly to GDP forecasts, inflation forecasts have been consistently too high, with each year predicted to break the cycle of weak inflation, only to disappoint as the year progresses

(Figure 8).

For policy purposes, the FOMC uses the core Personal Consumption Expenditures (PCE) index as the measure of inflation, which removes the more volatile fuel and food prices. This measure shows long-term inflation at or below the 2.0 percent target since September 2008. Core PCE growth averaged between 1.4 and 1.7 percent from 2015-2017, rose to average 1.9 percent in 2018 and fell back to average 1.5 percent in 2019.

Inflation in 2020 remained low, at 1.5 percent, while inflation from 2021 is expected to remain under the 2.0 percent FOMC target - the median predicted inflation from the December FOMC meeting was 1.8 percent.

In a fairly striking policy change, the FOMC announced in September that it would "aim to achieve inflation moderately above 2 percent for some time so that inflation averages 2 percent over time and longer-term inflation expectations remain well anchored at 2 percent." This is a marked departure from policy in the last 10 years, when there were a number of (sometimes contentious) interest rate increases, even though inflation was well below 2 percent.

Figure 8: U.S. Inflation Indices
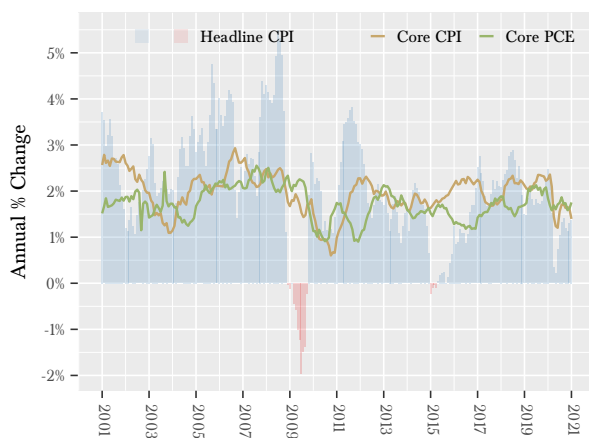
Interest Rates

Interest rates are a powerful tool used by the Federal Reserve bank to influence the U.S. economy. An increase in interest rates will generally slow down economic growth—business investment slows down because borrowing money becomes more expensive, so job and wage growth slow down (constraining consumption). Similarly, it becomes more expensive for consumers to borrow, impeding demand in the housing and auto markets. In normal times, a decrease in interest rates will expand investment, employment, wages, and consumer credit. The opposite of all of this is also true—decreasing or low interest rates can help drive economic expansion.

From December 2008 to December 2015, the Federal Reserve held the federal funds rate in the 0.0-0.25 percent range. To keep rates that low for that long was unprecedented and reflected the immense damage done by the Great Recession. During that time, the Fed pledged to keep the rates near zero until it judged that there had been sufficient progress toward its dual-mandate of maximum employment and around 2.0 percent inflation.

Beginning in December 2015, the FOMC gradually raised interest rates from 0.0-0.25 percent range to 2.25-2.5 percent range by the end of 2018. Its notable that these increases were made based on progress in the recovery of employment and inflation, and a strong economic growth outlook, rather than employment or inflation that had reached any threshold. Given this history, it is a significant change that the FOMC has backed away from this policy, promising to keep rates very low until the *average* inflation is around 2 percent.
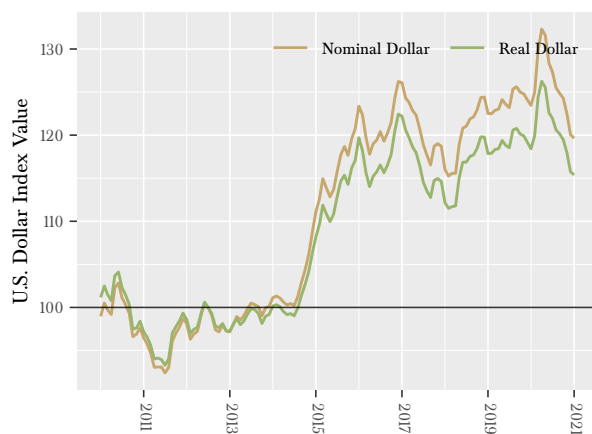
In response to the economic threat of the novel coronavirus pandemic, the FOMC held a special meeting in March and dropped the federal funds rate to 0.1 percent. In addition to the new policy, the FOMC outlook released on September 16 is extraordinary, showing that its median projections are for a 0.1 percent federal funds rate until *2022* at least. Its projections were unchanged in December.

The U.S. Dollar and Foreign Trade

The trade-weighted U.S. dollar index climbed dramatically from 2014 through late 2016. Through 2015 and 2016, this was largely due to the relative strength of the U.S. economy, which, although fairly weak, was growing faster than most other advanced countries. Although the value of the U.S. dollar was below its 2015 peak for most of 2016, the results of the U.S. presidential election pushed the exchange rate well above its previous high. From mid-2017 to May 2018, the dollar dropped back, but then increased above its earlier 2016 high. Between February and April, the U.S. dollar trade-weighted index jumped almost 6 percent, largely due to a "flight to safety" from the uncertainty caused by the pandemic (Figure 9). Since April, it has fallen back significantly, and is about where it was in mid-2018.

The falling dollar means that timber and lumber from the Pacific Northwest become less expensive for international buyers and, conversely, timber and lumber imported into the U.S. becomes more expensive. This will tend to support local prices and DNR's timber and agricultural revenues. Wildstock geoduck revenue will also be positively affected because geoduck is primarily marketed abroad.

mand for timber and lumber was a major support for lumber prices after 2010, even though DNR timber cannot be exported directly. Additionally, much of the soft white wheat produced in Washington is exported to Asia and the vast majority of the Pacific Northwest geoduck harvest is exported to China.

Prior to the COVID-19 pandemic, there were ongoing trade tensions between the U.S. and China. Although a "Phase One" trade deal had been signed before the pandemic to deescalate the trade war, there weren't actually any apparent changes to tariffs. China has imposed a number of tariffs on U.S. goods in response to U.S. tariffs. Of the products relevant to DNR revenue, softwood logs are subject to a 5 percent tariff. Geoduck, wheat, and many orchard/vineyard agricultural products (such as apples) are also subject to a 5 percent tariff, apparently due to the pandemic. Prior to the pandemic, they were taxed with a 25 percent tariff.

It appears that the new U.S. administration is focused on matters other than the trade war, so we don't expect any easing of tariffs anytime soon.

Figure 10: Crude Oil Prices

Figure 9: Trade-Weighted U.S. Dollar Index

Petroleum

Foreign trade and access to export markets is normally important for DNR revenues. Chinese de-
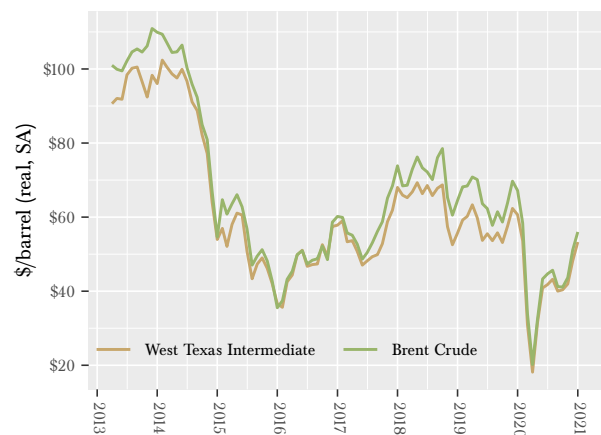
Crude oil and its derivatives strongly affect production, transportation, and consumption in the world and U.S. domestic economies. Broadly, a drop in oil
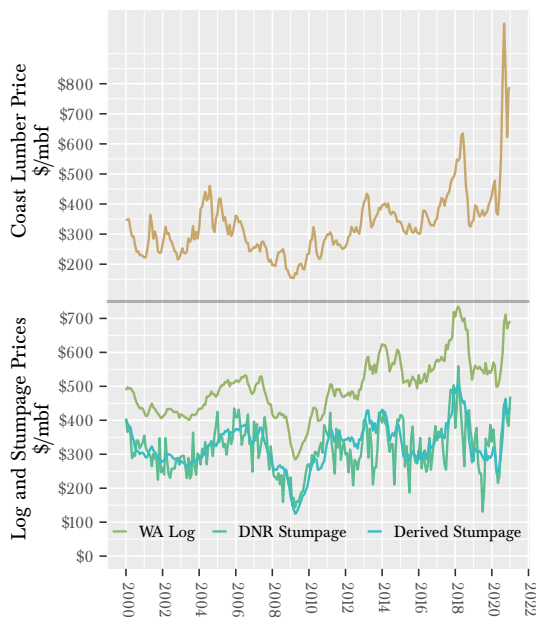
prices acts like a tax cut for consumers and can encourage consumption. Additionally, all other things being equal, lower petroleum prices will decrease diesel fuel prices and will make transportation-sensitive industries—such as Pacific Northwest logging and agriculture—more competitive in international markets.

As with everything else, the coronavirus pandemic has had a major impact on oil prices, even sending the spot prices negative for a short time (Figure 10). However, since then, prices have recovered to around $56/barrel in real terms—slightly below the 2019 average price. These are fairly low prices historically, so they are unlikely to put much of a drag on economic growth.

Wood Markets

Timber stumpage revenue constitutes about 70 percent of total DNR revenues on average. DNR is, therefore, vitally concerned with understanding stumpage prices, log prices, lumber prices, and the related supply and demand dynamics underlying all three. This section focuses on specific market factors that affect timber stumpage prices and overall timber sales revenue generated by DNR.

Figure 11: Lumber, Log, and Stumpage Prices in Washington

and the road-building requirements of a particular sale.

The relationship between lumber and log prices is less consistent. Lumber prices are significantly more volatile, and both the direction and size of price movements can differ from log prices. This is due to both demand and supply-side factors. On the demand side, mills will often have an inventory of logs in their yards, as well as an inventory of "standing logs," so they do not always need to bid up log or stumpage prices to take advantage of high lumber prices. From the supply side, landowners often do not need to sell their timber, so when prices fall too far, they can withhold supply and allow their trees to grow and increase in quality.

Figure 12: Lumber, Log, and DNR Stumpage Price Seasonality

In general, timber stumpage prices reflect demand for lumber and other wood products, timber supply, and regional lumber mill capacity. There is a consistent, positive relationship between log prices and DNR's stumpage prices, despite notable volatility in stumpage prices (Figure 11). High log prices make access to logs more valuable, increasing purchasers' willingness to pay for stumpage (the right to harvest). Volatility in stumpage prices arise not only from log prices, but also from the volume of lumber and logs held in mills' inventories and from DNR-specific issues, such as the quality and type of the stumpage mix offered at auction, the region,

There are differences in price seasonality between lumber, logs, and stumpage, as illustrated in Figure 12. These prices are affected by a degree of seasonality that is largely the result of when each of these commodities will be used. For instance, lumber prices tend to be higher starting in February, when housing construction starts to pick up, and decline through fall as demand wanes, while stumpage prices tend to be highest in December-March, when harvesters are lining up harvestable stock for the summer. DNR stumpage price volatility is also affected by the firefighting season and the

quality of the stumpage mix, which varies throughout the year but tends to be lower from July through September.

U.S. Housing Market

This section continues with a discussion of the U.S. housing market because it is particularly important to overall timber demand in the U.S.

New residential construction (housing starts) and residential improvements are major components of the total demand for timber in the U.S. From 2000-18, these sectors have averaged 69 percent of softwood consumption—37 percent going to housing starts and 32 percent to improvements—with the remainder going to industrial production and other applications.

The 2007 crash in the housing market and the following recession drastically reduced demand for new housing, which undermined the total demand for lumber. Since the 2009-11 trough, an increase in housing starts has driven an increase in lumber demand, though not to nearly the extent of the peak. Prolonged growth in starts is essential for a meaningful increase in the demand for lumber.

As with almost every other part of the economy, the coronavirus pandemic has created a lot of uncertainty in the housing market. Since the initial collapse in activity, both starts and new home sales have risen significantly—largely driven by strong household balance sheets and record-low mortgage rates.

New Home Sales

Unsurprisingly, new home sales plummeted during the 2008-09 recession, reaching a record low of 306,000 (SAAR) in 2011 before beginning a slow rise (Figure 13). New home sales increased from 440,000 (SAAR) in 2014 to an average of 616,000 in 2017, still well below the long-term (1963-2010) "normal" rate of 678,000 sales per year. In 2018, new home sales averaged 651,000 (SAAR) through May, before dropping meaningfully to average 593,000 for June-December. From November 2019 through January 2020, new home sales rose

steeply, to peak at 774,000, the highest it had been since the recession.

Figure 13: New Single-Family Home Sales
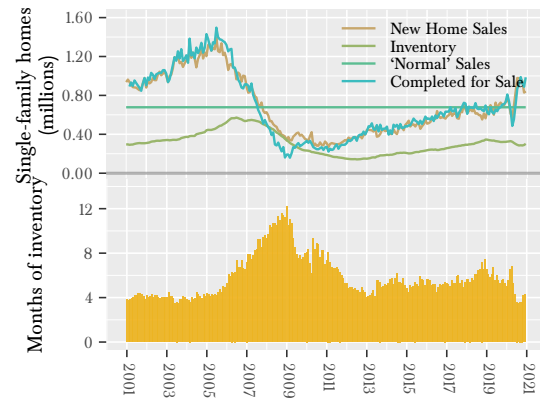
From January through April 2020, new single-family home sales fell back to 570,000. However, April was the bottom—since then, sales have grown beyond their January 2020 highs to a peak of 979,000 in July, before falling back to average 926,000 in the latter half of the year. In January 2021, 923,000 new homes were sold, still higher than any point between 2008-2020.

Based on the consistent high number of sales, very low interest rates for the foreseeable future, solid household balance sheets, and strong demand, new home sales are expected to remain high for some time.
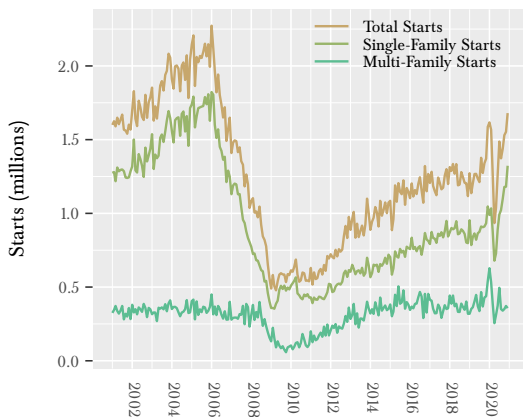
Housing Starts

In April 2009, U.S. housing starts fell to the lowest point since the Census Bureau began tracking these data in 1959. U.S. housing starts picked up in 2011 and continued to rise, largely because of increases in multi-family starts. Single-family starts were more or less flat after the recession through 2012, but rose slowly through most of 2019 (Figure 14). Starts picked up meaningfully in the last quarter of 2019 to average 1.3 million (SAAR), above the 1.25 million average for 2018. Although this was well above the 2012 average of 0.78 million (SAAR),

it is still well below the pre-recession long-term average of 1.6 million.

As with sales, starts increased dramatically from late 2019 to early 2020, hitting 1.5 million (SAAR) starts before dropping sharply in April 2020 to 0.9 million (SAAR). Again, as with sales, April 2020 was the nadir, and starts increased to over 1.5 million (SAAR) in October through December, before falling back to 1.4 million In January 2021. In the November Forecast, we noted that starts on the West Coast were not recovering as fast as nationally. That is no longer the case, with West Coast starts as high as they were in late 2019.

Like sales, expectations for starts for the foreseeable future have been increased based on the current rebound, very low interest rates, and underlying demand.

Figure 14: Housing Starts

Housing Prices

U.S. housing experienced six unprecedented years of falling or flat prices following the recession. House prices started rising again only in 2012 as economic and employment indicators continued to improve. Figure 15 charts the seasonally adjusted S&P/Case-Shiller Home Price Index for the 20-city composite, which estimates national existing home price trends, as well as the Index for Seattle.

Nationally, after increasing in most months since

bottoming out in January 2012, the Case-Shiller 20-city composite price index growth slowed significantly from May 2018 to late 2019. Seattle house prices had been growing much faster than national prices, doubling from its low in February 2012 to July 2018, while nationally house prices increased by 62 percent. From late 2019, the index started growing strongly again.

Figure 15: Case-Shiller Existing Home Price Index
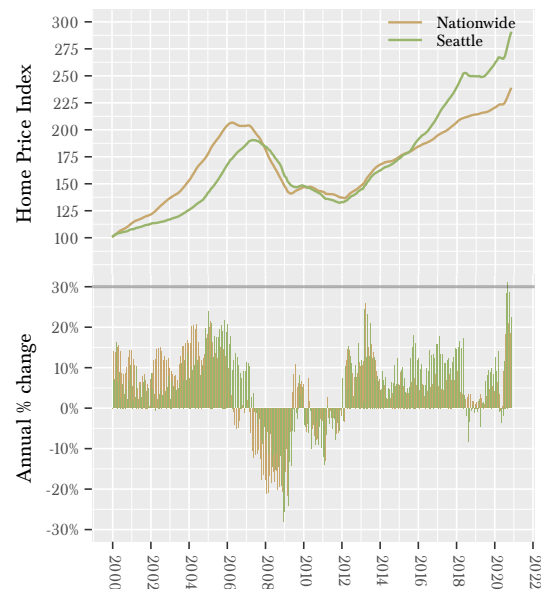
Although the pandemic initially slowed national price growth slightly, the national Case-Shiller ended the year with 9.7 percent year-over-year price growth in December. Locally, the Seattle Case-Shiller Index actually fell from a high of 267.1 in March to a low of 265.9 in June, but prices grew rapidly in the latter half of 2020. In December, the year-on-year price growth was 12.5 percent.

This rapid price growth is the result of both strong demand—largely due to low interest rates but also possibly due to demand from tele-workers looking for homes outside of cities—and *very* limited supply. The inventory of homes for sale plummeted as fewer people put their homes on sale, likely not wanting to have potential buyers walking through.

Export Markets

Although federal law prohibits export of logs from public lands west of the 108th meridian, log exports can still have a meaningful impact on DNR stumpage prices. Exports compete with domestic purchases for privately sourced logs and strong export competition pulls more of the supply from the domestic market, thereby raising all domestic prices. However, changes in export prices do not necessarily influence domestic prices in a one-to-one relationship.
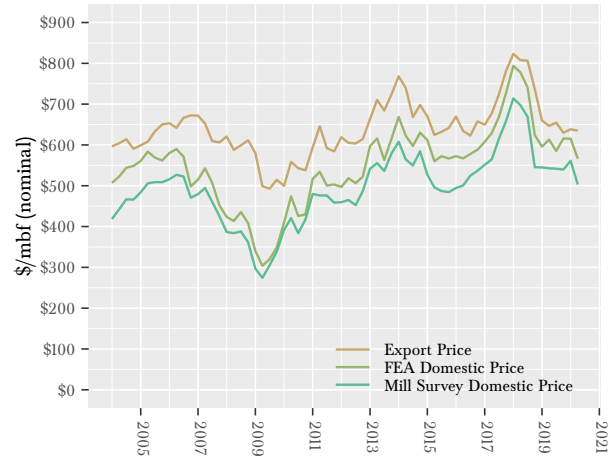
Figure 16: Log Export Prices

Export prices are almost always higher than domestic prices, a difference which is referred to as the "export premium" (Figure 16). The export premium is primarily due to the characteristics of the export markets, which can include a demand for higher-quality wood, a high value placed on long-term contracts, and high transaction costs.

Note that the export prices shown in Figure 16 are weighted by DNR's typical species mix, not the species mix of actual export volumes.

The primary markets for logs and lumber from Washington are China and Japan. Japan primarily imports Douglas-fir and has been relatively consistent, averaging 1.8 million m^3 per year since 2009. China primarily imports hemlock, but has been much more variable in its demand.

After entering the market meaningfully in 2010, demand from China was a major support for log and lumber prices in Washington (Figure 17). That started waning in late 2014 as China's economic health wavered, the U.S. dollar appreciated while the value of the euro and ruble dropped (making U.S. timber comparatively more costly), and a 25 percent Russian tariff on log exports was reduced.

Surprisingly, exports to Japan in the first four months of the year were actually around 20 percent higher than the first four months of 2019. As expected, exports to China continue to fall, as they are out-competed by local demand due to robust housing starts and the high prices they've caused.

Figure 17: Log Export Volume
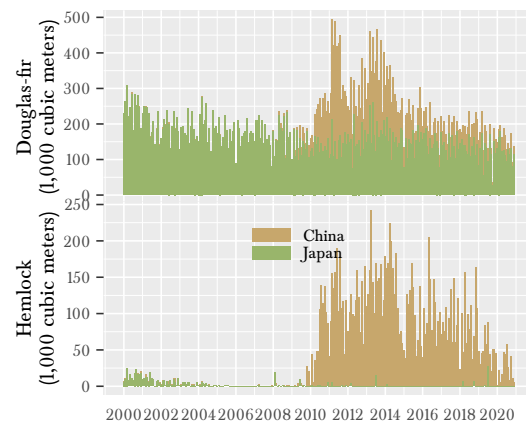
Price Outlook

Lumber Prices

As shown in Figure 11, lumber prices started increasing rapidly in late 2017. In June 2018, prices

hit $635/mbf, higher in real terms than any since 2000. However, from June 2018, prices dropped dramatically to a low of $324/mbf in November 2018—a 47 percent drop. Prices through October 2019 made a modest recovery to average $371/mbf, before jumping to $411/mbf in December 2019.

Lumber prices continued to recover through the beginning of 2020, but fell when the pandemic began. However, April appears to have been the bottom of the market, and prices have shot up due to constrained supply, from mill closures and furloughs, and strong demand, due to strong housing starts, and remodeling and renovation activity. Prices hit $1,000/mbf in September, fell back a bit from October to December, but have shot up again in January to $948/mbf.

Log Prices

Figure 18 presents prices for Douglas-fir, hemlock, and DNR's composite log. The latter is calculated from prices for logs delivered to regional mills, weighted by the average geographic location, species, and grade composition of timber typically sold by DNR. In other words, it is the price a mill would pay for delivery of the typical log harvested from DNR-managed lands. The dark green line for the DNR composite log price on Figure 18 is the same as the light green line on Figure 11.

Log prices appear to have also bottomed in April 2020 and by August had recovered. Prices are not likely to see the same extreme increases that lumber has because timber harvesters and mills often have an inventory of standing timber to draw from so they don't always need to bid up prices. Prices have continued to rise since August 2020 and are expected to peak in Q1 2021, before slowly decreasing through the rest of the year. Calendar year 2021 is still expected to have a higher average price through they year than 2020.
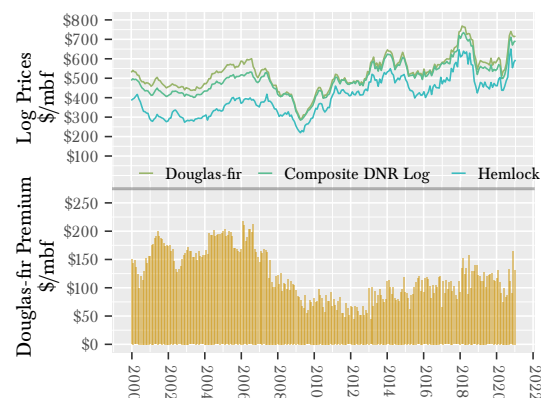
Stumpage Prices

Timber stumpage prices are the prices that successful bidders pay for the right to harvest timber from DNR-managed lands (Figure 19). At any time,

the difference between the delivered log price and DNR's stumpage price is equivalent to the sum of logging costs, hauling costs, and harvest profit (Figure 11). Subtracting the average of these costs from the log price line gives us a derived DNR stumpage price.

When actual DNR stumpage prices differ significantly from the derived stumpage prices, a correction is likely to occur. Currently, stumpage prices are roughly in line with log prices—both having rebounded from the fall in Q2 2020. While log and lumber prices bottomed out in April, DNR stumpage prices fell through May, to a low average auction price of $215/mbf. However, they rebounded earlier than expected, jumping to $347 in July, which typically has the lowest auction prices of a year. Since then, DNR timber auctions have had very strong prices, so that the average stumpage for FY 21 is $410/mbf for sales through February 2021.

As always, these prices also depend heavily upon the characteristics of the sales, particularly the type and quality of the wood, the type of logging, and the costs associated with road building and maintenance. Right now, sales prices may also be more heavily influenced by the ready availability of the sales, that is, whether purchasers can begin harvesting soon or whether they have to do a lot of preparatory work.

Figure 18: DNR Composite Log Prices

DNR Stumpage Price Outlook

DNR currently contracts with a forest economics consulting firm that provides log and timber stumpage price forecasts, as well as valuable insights into the housing, lumber, and timber markets. By modeling DNR's historical data on its price forecasts, we arrive at a stumpage price outlook (Figure 19, note that the FEA "forecast" series reflects the species and class characteristics of typical DNR timber; the original series were West Coast averages, and are not shown).

It is important to note that these are nominal price expectations.

Figure 19: DNR Timber Stumpage Price
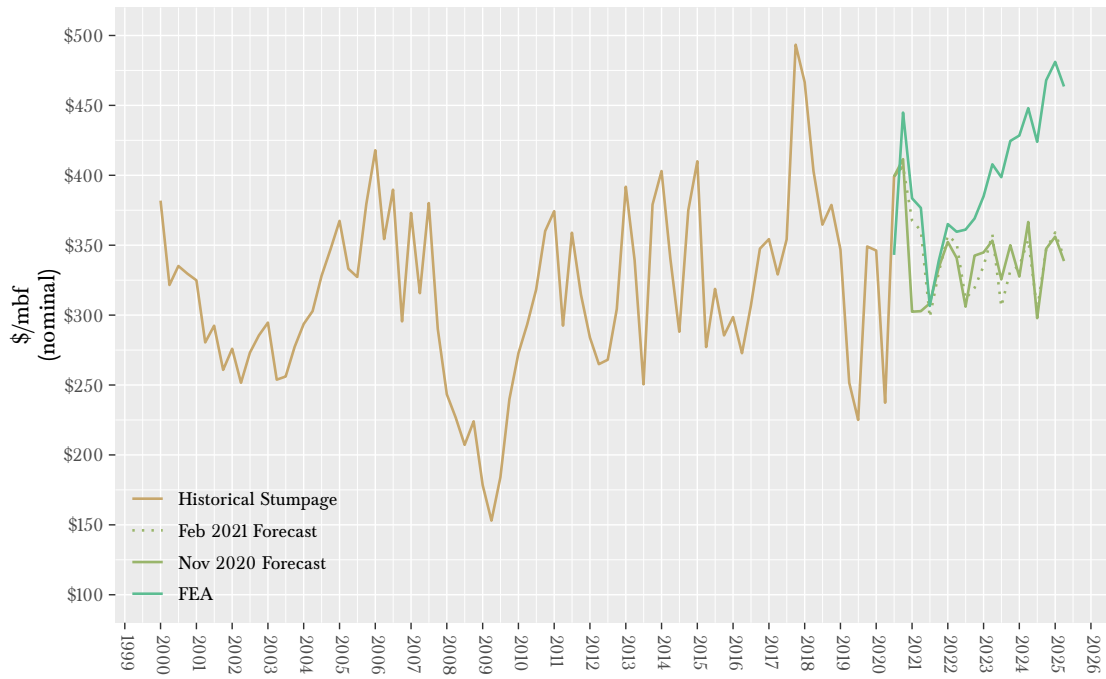
DNR Revenue Forecast

This Revenue Forecast includes revenue generated from timber sales on trust uplands, leases on trust uplands, and leases on aquatic lands. It also forecasts revenues to individual funds, including DNR management funds, beneficiary current funds, and beneficiary permanent funds. Caveats about the uncertainty of forecasting DNR-managed revenues are summarized near the end of this section.

Timber Revenue

DNR sells timber through auctioned contracts that vary in duration. For instance, contracts for DNR timber sales sold in FY 2019 needed to be harvested between three months and three years from the date of sale, with most being around two years. The purchaser determines the actual timing of harvest within the terms of the contract, which is likely based on perceptions of market conditions. As a result, timber revenues to beneficiaries and DNR management funds lag behind sales.

For the purposes of this chapter, timber that is sold but not yet harvested is referred to as "inventory" or "under contract." Timber volume is added to the inventory when it is sold and placed under contract, and it is removed from the inventory when the timber is harvested.

Figure 20: Forecast Timber Sales Volume
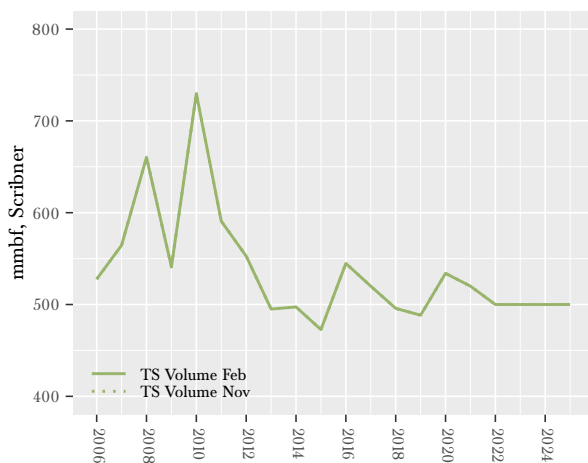
Timber Sales Volume

The sales volume forecast for FY 21 is held at 520 mmbf based on consistent strong demand and DNR planned sales (Figure 20). DNR plans to offer roughly 560 mmbf for sale, including some remaining sales that had been planned for FYs 19 and 20. However, there are always sales that receive no bids, and it is not unusual to have sales contested or withdrawn. The sales volume forecast in outlying years in unchanged.

FY 15 was the first year of the new sustainable harvest decade (FY 15 through FY 24) for Western Washington, though the new Sustainable Harvest Calculation wasn't officially adopted until December 2019. However, multiple lawsuits have been filed that put the status of the new sustainable harvest estimates into question. Without certainty on the sustainable harvest limit, annual Westside sales volumes forecasts are unchanged at 450 mmbf for future years. Together with projected Eastside timber sales of 50 mmbf for each of the next several years, we arrive at a projected annual timber sales volume of about 500 mmbf for FYs 22-25.

Figure 21: Forecast Timber Removal Volume
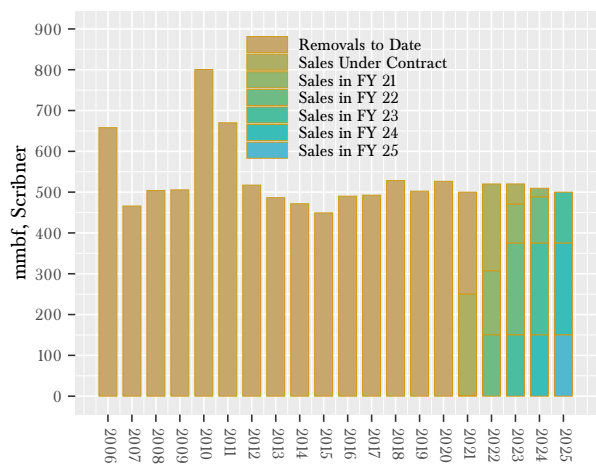
Timber Removal Volume

The FY 20 removal volume was 527 mmbf, 17 mmbf higher than we forecast in June (Figure 21). The FY 21 volume harvest forecast is reduced by 10 mmbf to 500 mmbf due to slow harvest activity. It

appears that this is due primarily to an enormous amount of fire salvage timber coming out of Oregon. Burned timber must be harvested quickly to recover any value out of it and the salvage operations are tying up a lot of the available log hauling capacity. Removal volumes in outlying years are unchanged.

Figure 22: Forecast Timber Sales Price

Timber Sales Prices

The price results of monthly DNR timber sales are quite volatile (Figure 11). As discussed in the stumpage price outlook, the DNR sales price

(stumpage) forecast is informed by West Coast log and stumpage price estimates from a forest economics consulting firm. The sales price forecast for FY 21 are increased by $40/mbf due to consistently high demand and auction prices.

Timber Removal Prices

Timber removal prices are determined by sales prices, volumes, and harvest timing. They can be thought of as a moving average of previous timber sales prices, weighted by the volume of auctioned timber removed in each time period. (Figure 23).

The expected increase in FY 21 sales prices, a high average removal price for harvests to date and an increase in the value of timber inventory expiring in FY 21—it appears that harvesters have been harvesting higher-value timber expiring in FY 22 and beyond—have increased removal price expectations through FY 24.
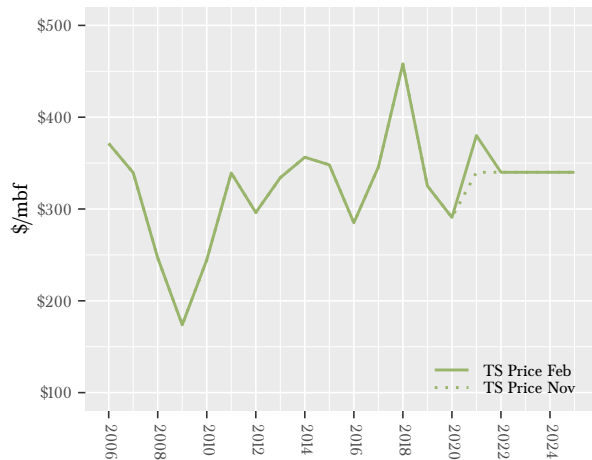
Figure 24: Forecast Timber Removal Value
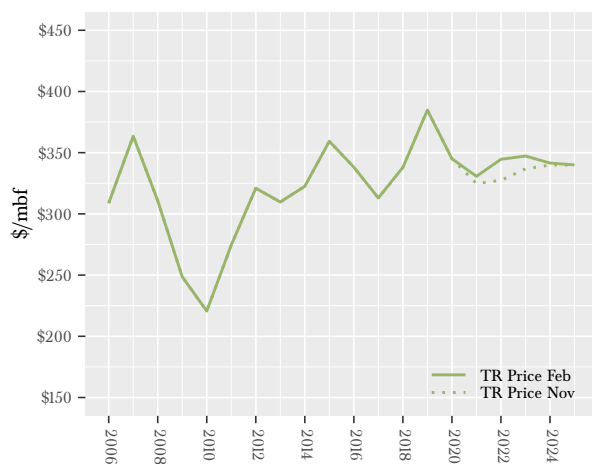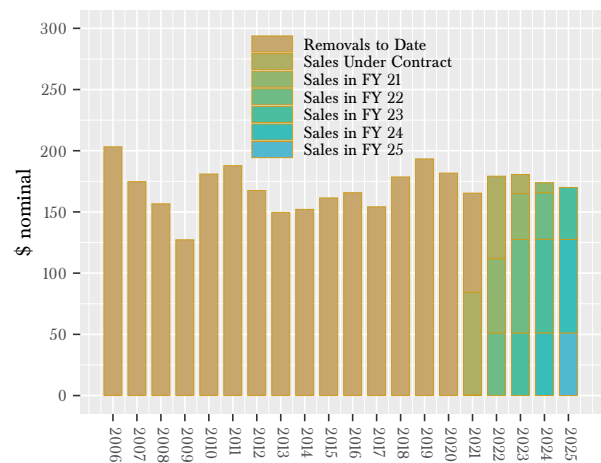

Figure 23: Forecast Timber Removal Price

Timber Removal Revenue

Figure 24 shows projected annual timber removal revenues, broken down by the fiscal year in which the timber was sold. Revenue estimates reflect all of the changes described above.

Forecast revenues for the 2019-21 biennium remain at $347 million (-$0 million) and revenues for the

2021-23 biennium are increased to $353 million
(+$21 million).

Figure 25: Forecast Timber Removal Revenue
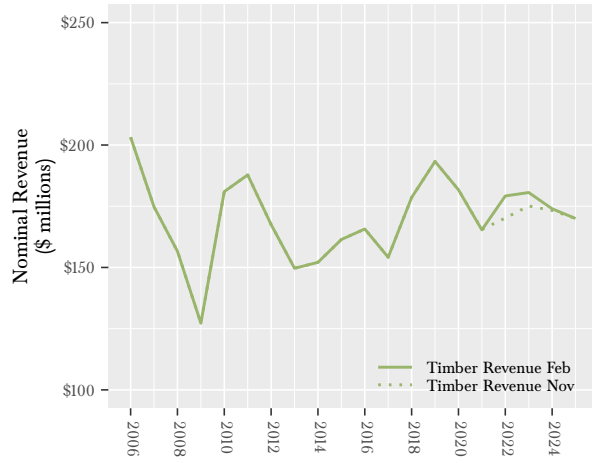
Upland Lease Revenues

Upland lease revenues are generated primarily from leases and the sale of valuable materials other than timber, on state trust lands (Figure 26).

Communication lease revenue forecast is increased in FY 21 due to lease renewals that required payment of back rent. This extra $200,000 is on top of base rents, and is not expected to happen in the future. Additionally, mineral and hydrocarbon rents have been higher than expected due to increased quarry production, and a very large rights-of-way contract has pushed up revenue in Other leases.

Figure 26: Forecast Upland Lease Revenue
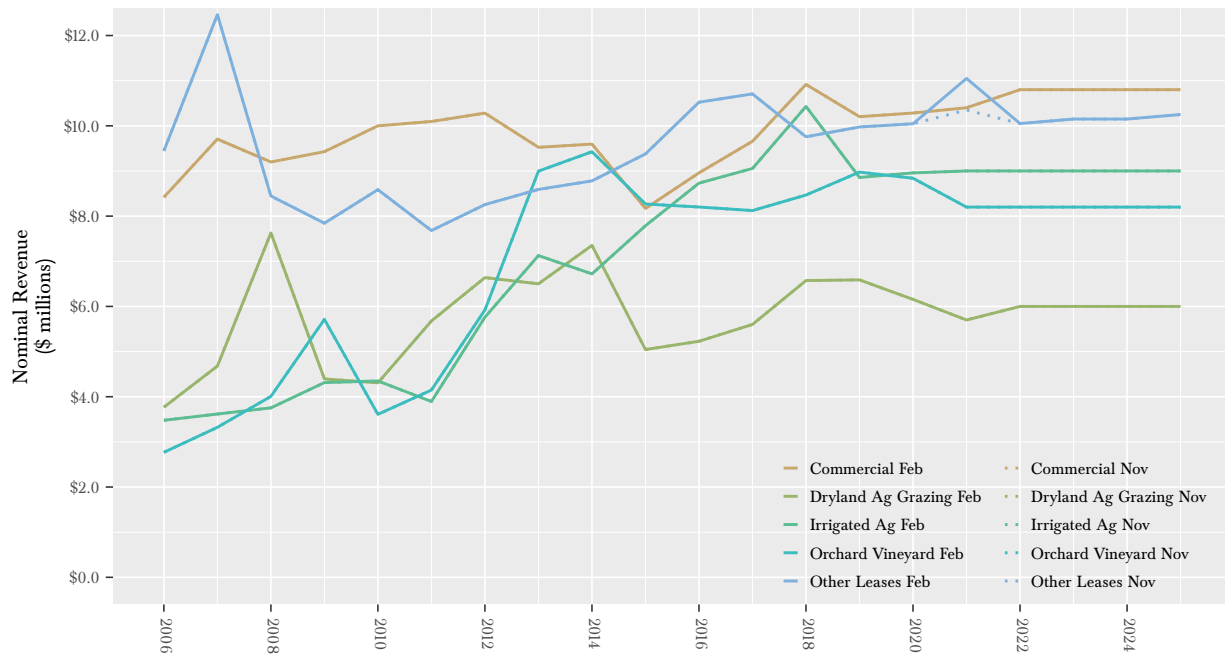
Aquatic Lands Revenues

Aquatic lands revenues are generated from leases on aquatic lands and from sales of geoduck. On average, leases account for one-third of the revenue and geoduck sales account for the remainder. However, prices for geoduck have plummeted since the beginning of FY 20, so we are now forecasting geoduck to make up less than half of the aquatic lands revenue.

The aquatic lease revenue forecast is decreased by $0.8 million in FY 21 due to very low to-date revenue in non-water-dependent rents and slightly lower other revenue offsetting higher-than-expected revenue in aquaculture and easements (Figure 27).

By late 2019, geoduck prices had already fallen substantially because of the slowdown in Chinese economic growth and the impact of the trade war. After the lockdown in China due to COVID-19, harvest of geoduck destined for China basically stopped, leaving only about 10 percent of the normal daily harvest—which is bound for other international locations or for domestic consumption.

Demand from China recovered substantially by mid-2020. We had assumed that harvest volumes would recover reasonably quickly to the roughly 95 percent of sales volume that we typically see. However, that was too optimistic and harvest volumes lagged for much longer. Our harvest volume assumptions are 85 percent of the sales volume for the foreseeable future.

Prices held up much better than we had feared at the outset of the pandemic. The April auction offered indemnification for purchasers if they did not harvest all of their contracted pounds—which led to a surprising $8.98/lb. average price (Figure 28). However, the June auction had an average price of $8.46/lb. and, importantly, did not offer a blanket indemnification. Prices for the July and September auctions fell to $5.05/lb. and $6.11/lb., respectively. The December price rebounded to $8.64—higher because this auction harvest period covered Chinese New Year, typically a period of very high demand. In January 2021, prices fell back to $6.82

before fetching almost $10/lb in the February auction.

Forecast geoduck revenue is increased FY 21 through FY 22, but decreased in FYs 24 and 25. The decrease in outlying years is due revised assumptions about when tariffs on geoduck might be lifted by China. At this point, we don't expect to see prices return to consistently above $12, though this is obviously still possible. The trade tensions with China don't seem to be easing, and Chinese consumers are moving to other luxury seafoods instead of geoduck.


Figure 27: Aquatic Lands Revenues
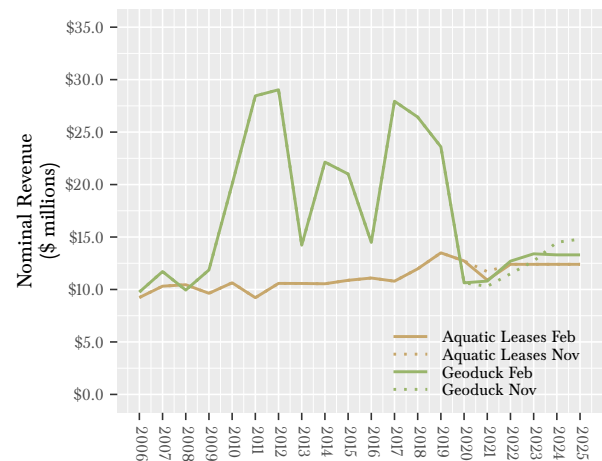
There are, as always, potentially significant downside risks to geoduck revenues, even in the near term and in addition to the pandemic, that are important to consider but difficult to forecast:

- Harvests (and therefore revenues) could be deferred or lost if geoduck beds are closed due to occurrence of paralytic shellfish poison.

- Early in 2021, heavy rains overwhelmed sewage treatement plants in the Puget Sound, spilling untreated sewage into the sound and closing geoduck tracts for several weeks. Although program staff were able to offer alternative harvest from different tracts, this type of risk will continue as climate change grows more severe.

- Furloughs at the Washington State Department of Health have delayed PSP and arsenic analyses and have led to lost fishing days in the past couple of months. It is unclear if these will continue or how disruptive they will be.

- In light of recent Washington Department of Fish and Wildlife surveys of closed South Puget Sound geoduck tracts showing declining recovery rates, and evidence of active poaching, future commercial harvest levels may be further reduced.
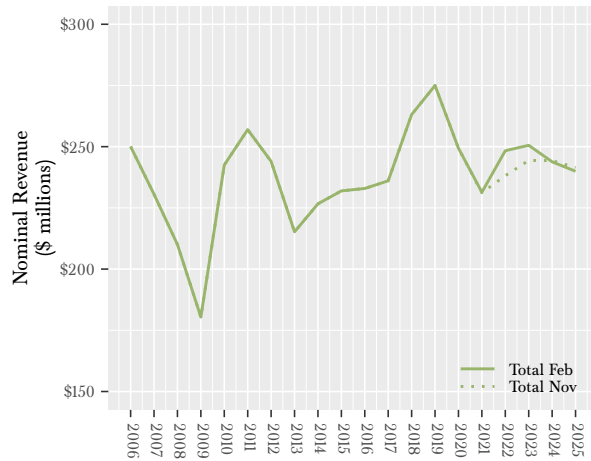
Figure 28: Geoduck Auction Prices
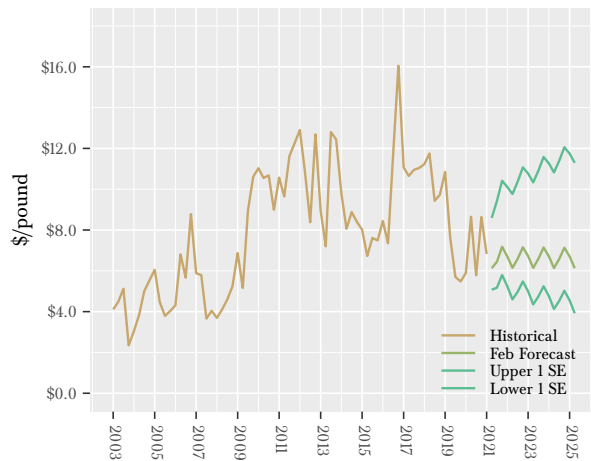
Total Revenues from All Sources

Forecast revenues for the 2019-2021 Biennium (FYs 20 and 21) are decreased by 0.0 percent ($0.2 million) to $481 million, and revenues for the 2021-2023 biennium are increased by 3.4 percent ($16 million) to $499 million (Figure 29).

Figure 29: Total Revenues

Distribution of Revenues

The distribution of timber revenues by trust are based on:

- The volumes and values of timber in the inventory (sales sold but not yet harvested) by trust;

- The volumes of timber in planned sales for FYs 21 by trust, and relative historical timber prices by DNR region by trust; and

- The volumes of timber by trust for FYs 22-25 based on output of the sustainable harvest model and relative historical timber prices by DNR region by trust.

Because a single timber sale can be worth more than $3 million, dropping, adding, or delaying even one sale can represent a significant shift in revenues to a specific trust fund.

Distributions of upland and aquatic lease revenues by trust are assumed to be proportional to historic distributions unless otherwise specified.

Management Fee Deduction. The underlying statutory management fee deductions to DNR as authorized by the Legislature are 25 percent or less, as determined by the Board of Natural Resources (Board), for both the Resources Management Cost

Account (RMCA) and the Forest Development Account (FDA). In biennial budget bills, the Legislature has authorized a deduction of up to 30 percent to RMCA since July 1, 2005. In 2015, they began authorizing an RMCA deduction of up to 31 percent.

At its April 2011 meeting, the Board adopted a resolution to reduce the RMCA deduction from 30 to 27 percent and the FDA deduction from 25 to 23 percent. At its July 2011 meeting, the Board decided to continue the deductions at 27 percent for RMCA (so long as this rate is authorized by the Legislature) and at 23 percent for FDA. At its October 2011 meeting, the Board approved a resolution to reduce the FDA deduction from 23 to 21 percent. The Board decided in July 2013 to raise the FDA deduction to 25 percent and the RMCA deduction to 29 percent. In August 2015, the Board raised the RMCA deduction up to 31 percent for the 2015-2017 biennium.

The Forecast uses the 31 percent deduction for the all forecast years. This assumes that the Legislature will continue to approve RMCA deductions of up to 31 percent.

Given this background of official actions by the Legislature and the Board, the management fee deductions assumed in this Forecast are:

	FY 21	FY 22	FY 23	FY 24	FY 25
FDA	25	25	25	25	25
RMCA	31	31	31	31	31