

# PUTTING THE PUZZLE TOGETHER: FRASS

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> Western Forest Economist Meeting May 18-20, 2014 Missoula, Montana

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### Agenda

### In a short amount of time, we will take a long walk together





## Software-as-a-Service (SaaS)

Cloud, distributed computing, many names...
Internet connection from Client to Host

Thin client - or better
No update hastles for client
No processing demands on client-side
No storage on client-side
In-Network Portfolio sharing
High security for all confidential data







#### Forest Resource Analysis System Software

#### © 2013 Forest Econometrics

### **Forest Resource Analysis System Software** FRASS

#### http://FRASS.Forest-Econometrics.com/

**Demonstration Site: University of Washington's** Pack Forest, near Eatonville, Washington UW is not a participant in the FRASS program's development or promotion.



### The FRASS Purpose?

- Temporal considerations,
- Parcel attributes,
- Management options,
- Administrative opportunities,
- Growth & Yield,
- Market Timing
- Financially optimal Highest & Best Use





### Agenda

### In a short amount of time, we will take a long walk together





## Data Design / Puzzle Pieces

### Some assembly required





Resource Anal

### **Data Design**



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## **Data Availability**

#### "Everyone has it... right?"



Although forest management data is compiled and used constantly for forest management, relatively few organizations have it all assembled, ready for se – on-demand.

- Forest Growth & Yield data
- Comprehensive GIS data
- Nominal Delivered Log Market
   Data



### Agenda

### In a short amount of time, we will take a long walk together



### **Structure & Assembly**

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#### Financially Optimal Harvest Timing MATCHES Highest & Best Use Value

Harvest Scheduling & Property Valuation Process for Forestlands in FRASS: Highest and Best Use for Timber Production



## **Initial Parcel Summary**

### Snapshot of Today: our starting point

←

Forest Resource Analysis S 🗴 🔪

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			· · ·		
+	Add new record				
	Name	Address	City	State	Zip
	<b>T</b>			·	
>	Roger Chapman	Forest Mensuration Drive	Pullman	WA	99163
>	Herman Nelson	1 Bear Creek-Dewatto Rd	Belfair	WA	98528
>	Chadwick Oliver	Yale School of Forestry & Environmental Studies 195 Prospect Street	New Haven	СТ	06511
>	Charles Lathrop	9010 453rd St. East	Eatonville	WA	98328
>	Daniel Lawson	5 Venuk Way	Pullman	WA	99163
>	Dietrich Brandis	1 Father of Tropical Forestry Lane	Bonn, West Germany	GR	99999
>	Dimitri Lawson	2 Venuk Way	Pullman	WA	99163
>	Georg Ludwig Hartig	1786 Darmstadt School of Forestry	Gladenbach, Hesse, Germany	GR	99999
>	George W. Vanderbilt	36 Montford Ave. Biltmore Stick	Asheville	NC	28801
>	Frederick Weverhaeuser	P.O. Box 9777	Federal Way	WA	98063



### Agenda

### In a short amount of time, we will take a long walk together



![](_page_13_Picture_0.jpeg)

## **Volume, Price & Cost**

#### Prices & Costs must be integrated with Growth & Yield

![](_page_13_Picture_3.jpeg)

![](_page_13_Picture_4.jpeg)

![](_page_13_Picture_5.jpeg)

### **Biometric** Forecasting

**Delivered Log Price Predictions** 

![](_page_13_Picture_8.jpeg)

**Logging Cost Expectations** 

## **Order of Operations**

### Optimality combines Each Rotation on Each Timber Stand

Growth & Yield											
Grow CURREN years in 5 ye	Grow CURRENT rotation for 200 years in 5 year increments Grow NEXT rotation for 200 years in 5 year increments										
	2	7		·E							
Delivered Log Market Price Forecasts											
Real Price Appre	Real Price Appreciation Forecasts into the "future" in 5 year increments										
	2	7		· F							
Forest Management Cost Forecasts											
Logging	Log Trucking	Overhead & Administration	Professional Labor								

Databases referenced to specific event years.

- Each Rotation on each timber stand.
- Growth & Yield data
  matched to the
  local market area.
- FRASS is NOT
  - GIS Program
  - G&Y Program
  - An Appraiser

![](_page_15_Picture_0.jpeg)

#### ← → C f [] frass.forest-econometrics.com/MarketModel/MarketModel.aspx

e Locator Interactive Map Parcels	Owners Market Mode	els My Reports Users	Admin Logout			
Delivered Log Market Portfolio					^	
Start New Delivered Log Market Portfolio	es la construction de la constru					
Model Name	Created/Updated	Creator	Editor	Share It	Delete It	
<u>NW Pacific Rim</u>	11/04/2013	William Schlosser	William Schlosser	Share	Delete	
<u>WWa 201311</u>	11/04/2013	William Schlosser	William Schlosser	Share	Delete	
<u>NW Pacific Rim 70s</u>	11/14/2013	William Schlosser	William Schlosser	Share	Delete	
NW Pacific Rim Flater	02/05/2014	Georg Räumliche	William Schlosser	Share	Delete	
<u>Test Bed 201401</u>	01/02/2014	William Schlosser	William Schlosser	Share	Delete	
Puget 201401	01/25/2014	William Schlosser	William Schlosser	Share	Delete	
<u>Will &amp; Bill</u>	01/22/2014	William Schlosser	William Schlosser	Share	Delete	
ITLP	01/30/2014	William Schlosser	William Schlosser	Share	Delete	
Puget 201402	02/21/2014	William Schlosser	William Schlosser	Share	Delete	
Intrafor 20140225	02/25/2014	William Schlosser	William Schlosser	Share	Delete	
Puget 201404	04/16/2014	William Schlosser	William Schlosser	Share	Delete	
Puget 201404B	04/18/2014	William Schlosser	William Schlosser	Share	Delete	

Start New RPA Market Portfolio

![](_page_15_Picture_4.jpeg)

![](_page_15_Picture_5.jpeg)

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orest Resource Analysis System Software

## **Real Price Appreciation Portfolio**

← → C 🤺 🗋 frass.forest-econometrics.com/MarketModel/MarketModel
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Puget 201404	04/16/2014	William Schlosser	William Schlosser	Share	Delete
Puget 201404B	04/18/2014	William Schlosser	William Schlosser	Share	Delete
<u>Market 20140421</u>	04/21/2014	William Schlosser	William Schlosser	Share	Delete
PA Portfolio					^
Start New RPA Market Portfolio					
Model Name	Created/Updated	Creator	Editor	Share It	Delete It
Cascadia 201311	03/20/2014	William Schlosser	William Schlosser	Share	Delete
Cascadia 20131104	11/05/2013	William Schlosser	William Schlosser	Share	Delete
Recovery 201311	11/04/2013	William Schlosser	William Schlosser	Share	Delete
Cascadia 20131106	11/16/2013	Georg Räumliche	William Schlosser	Share	Delete
Cascadia 20131116	12/13/2013	Georg Räumliche	William Schlosser	Share	Delete
Cascadia 20140215	02/15/2014	William Schlosser	William Schlosser	Share	Delete
Cascadia 20131223	12/23/2013	William Schlosser	William Schlosser	Share	Delete
Cascadia 20131224	01/02/2014	William Schlosser	William Schlosser	Share	Delete
Cascadia 201401	01/15/2014	William Schlosser	William Schlosser	Share	Delete
Cascadia 20140119	01/20/2014	William Schlosser	William Schlosser	Share	Delete
Cascadia 20140120	01/20/2014	William Schlosser	William Schlosser	Share	Delete
Cascadia 20140122	02/08/2014	William Schlosser	William Schlosser	Share	Delete
Cascadia 20140208	02/10/2014	William Schlosser	William Schlosser	Share	Delete
Cascadia 20140318	03/18/2014	William Schlosser	William Schlosser	Share	Delete
Cascadia 20140320	03/21/2014	William Schlosser	William Schlosser	Share	Delete
Cascadia 20140325	04/15/2014	William Schlosser	William Schlosser	Share	Delete
Cascadia 20140414	04/18/2014	William Schlosser	William Schlosser	Share	Delete

PLAY!

© 2014 Forest Econometric

![](_page_16_Picture_7.jpeg)

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## **Share Your Portfolios**

![](_page_17_Picture_1.jpeg)

← → C f frass.forest-econometrics.com/MarketModel/MarketModel.aspx

Forest	Resource A	Analysis Syst	em <b>S</b> oftware		
me Locator Inter	active Map Parcels	Owners Market Mo	dels My Reports Users	Admin Logout	
elivered Log Market Por	tfolio				^
Start New Delivered Lo	g Market Portfolio				
Model Name		Created/Updated	Creator	Editor	Share It Delete It
NW Pacific Rim		11/04/2013	William Schlosser	William Schlosser	Share Delete
<u>WWa 201311</u>		11/04/2013	William Schlosser	William Schlosser	Share Delete
NW Pacific Rim 70s		11/14/2013	William Schlosser	William Schlosser	Share Delete
NW Pacific Rim Flater		02/05/2014	Georg Räumliche	William Schlosser	Share Delete
Test Bed 201401		01/02/2014	William Schlosser	William Schlosser	Share Delete
Puget 201401		01/25/2014	William Schlosser	William Schlosser	Share Delete
Will & Bill		01/22/2014	William Schlosser	William Schlosser	Share Delete
ITLP		01/30/2014	William Schlosser	William Schlosser	Share Delete
Puget 201402		02/21/2014	William Schlosser	William Schlosser	Share Delete
Intrafor 20140225		02/25/2014	William Schlosser	William Schlosser	Share Delete
Puget 201404		04/16/2014	William Schlosser	William Schlosser	Share Delete
Puget 201404B		04/18/2014	William Schlosser	William Schlosser	Share Delete
Market 20140421		04/21/2014	William Schlosser	William Schlosser	Share Delete

Portfolio Sharing is internal to the FRASS Program, only share notification is sent over e-mail.

![](_page_17_Picture_5.jpeg)

![](_page_18_Picture_0.jpeg)

![](_page_18_Figure_1.jpeg)

## **Delivered Log Price Examples**

metric\$

2 Saw Real

#### Puget Sound Delivered Log Market Examples

Western Red Alder 2 Saw Real 201403 with RPA Forecast
\$1,500
\$1,400
\$1,300

![](_page_19_Figure_3.jpeg)

## **Delivered Log Price Examples**

metric\$

#### Puget Sound Delivered Log Market Examples

Douglas-fir Export 8-12" Real 201403 with RPA Forecast

![](_page_20_Figure_3.jpeg)

![](_page_21_Picture_0.jpeg)

### Agenda

### In a short amount of time, we will take a long walk together

![](_page_21_Figure_3.jpeg)

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## **Timing is Everything**

### Look beyond the single rotation optimum

## **Looking Forward**

Export to PDF Generate Full Parcel F

View Market Value F

View Stand Report || 198381

#### 201402

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### **Future Nominal Prices**

		Landowner Discount				New Logging Pood						
Market Model Nar	ne RPA Port	folio Name	Rate of Inflation	Rate	Reforestation Cost	Access Fee (Tim	ber) Maintenan	ce Fee	Const	truction	Koad	
Puget 201402	Cascadia	20140414	2.75%	2.81%	\$375/Acre	\$0.50/MBF/Mile	\$1.33/MBF/	Mile	\$19,50	00/Mile		
								Desta		P	1 1/-	l
Sort	Market Value	RPA	Longevity Te	rm Profit & Risk	Overhead & Administration	Logging Cost	Hauling Cost	2014	2015	2020	2030	2040 2040
estern Red Alder												
Saw	\$716	0.0716	10.91	0.00	\$35	\$135	\$45	\$716	\$758	\$810	\$945	\$1,1
Saw	\$680	0.0587	10.91	0.00	\$35	\$135	\$45	\$680	\$693	\$748	\$888	\$1,0
4 Saw	\$558	0.0625	10.91	0.00	\$35	\$135	\$45	\$558	\$589	\$634	\$748	\$916
Pulp	\$.156	-0.1126	4.50	0.00	\$5	\$25	\$45	\$256	\$258	\$315	\$429	\$566
Black Cottonwood												
2 Saw	\$5.15	-0.0946	1.75	0.00	\$35	\$135	\$45	\$525	\$476	\$573	\$757	\$992
3 Saw	\$5CD	-0.0512	2.91	0.00	\$35	\$135	\$45	\$500	\$434	\$529	\$716	\$941
4 Saw/CNS	\$378	-0.0665	2.16	0.00	\$35	\$135	\$45	\$378	\$395	\$478	\$636	\$834
ılp	\$26	-0.1310	4.75	0.00	\$5	\$25	\$45	\$269	\$217	\$272	\$377	\$499
ouglas-fir												
(port 12"+	\$747	-0.1489	2.50	0.00	\$35	\$135	\$45	\$747	\$789	\$960	\$1,279	\$1,6
(port 8-12"	\$710	-0.1796	2.50	0.00	\$35	\$135	\$45	\$710	\$738	\$910	\$1,215	\$1,5
SrvI and Better	\$752	-0.1568	3.00	0.00	\$35	\$135	\$45	\$752	\$688	\$879	\$1,199	\$1,57
2 Saw	\$681	-0.1619	3.00	0.00	\$35	\$135	\$45	\$681	\$666	\$854	\$1,167	\$1,53
3 Saw	\$673	-0.1613	3.00	0.00	\$35	\$135	\$45	\$673	\$633	\$812	\$1,109	\$1,4
4 Saw	\$613	-0.1595	3.00	0.00	\$35	\$135	\$45	\$613	\$590	\$755	\$1,031	\$1,3
Chip-n-Saw	\$46:	-0.2149	2.66	0.00	\$35	\$135	\$45	\$461	\$390	\$498	\$673	\$884
ulp	\$26	-0.2527	3.08	0.00	\$5	\$25	\$45	\$269	\$309	\$363	\$481	\$631
<u>/estern Redcedar</u>												
amprun	\$1,155	-0.1110	3.08	0.00	\$35	\$135	\$45	\$1,15	5 \$1,102	2 \$1,422	\$1,964	\$2,5
estern Hemlock												
(port 12"+	\$723	-0.1720	3.08	0.00	\$35	\$135	\$45	\$723	\$701	\$827	\$1,095	\$1,4
(port 8-12"	\$745	-0.1792	3.08	0.00	\$35	\$135	\$45	\$745	\$686	\$810	\$1,074	\$1,4
✓ and Better	600	-0.1195	4.83	0.00	\$35	\$135	\$45	\$600	\$535	\$674	\$943	\$1,2
2 Saw	\$601	-0.1336	4.83	0.00	\$35	\$135	\$45	\$601	\$573	\$732	\$1,033	\$1,3
3 Saw	\$607	-0.1221	4.83	0.00	\$35	\$135	\$45	\$607	\$524	\$662	\$928	\$1,2
4 Saw	\$536	-0.1211	4.83	0.00	\$35	\$135	\$45	\$536	\$482	\$608	\$852	\$1,1
Pulp	\$297	-0.1808	4.58	0.00	\$5	\$25	\$45	\$297	\$301	\$385	\$541	\$717

![](_page_24_Picture_0.jpeg)

![](_page_24_Figure_1.jpeg)

## **Log Market Forecasts**

![](_page_25_Figure_1.jpeg)

http://Forest-Econometrics.com/

## **Looking Forward**

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 View Market Value Report
 201402

 View Stand Report
 198381

 Export to PDF
 Generate Full Parcel Report

### **Future Nominal Prices**

Market Model Na	me RPA	Portfolio Name	Rate of Inflation	Landowner Discount Rate	Reforestation Cost	Reforestation Cost Access Fee (Timber)		e Fee	New Logging Road Construction			
Puget 201402	Casca	adia 20140414	2.75%	2.81%	\$375/Acre	\$0.50/MBF/Mile	\$1.33/MBF/N	lile	\$19,50	0/Mile		
Sort	Market Valu	e RPA	Longevity Terr	m Profit & Risk	Overhead & Administration	Logging Cost	Hauling Cost	Projec 2014	ted De 2015	ivered 2020	Log Val 2030	ue 2040
Western Red Alder												
2 Saw	\$716	0.0716	10.91	0.00	\$35	\$135	\$45	\$716	\$758	\$810	\$945	\$1,147
3 Saw	\$680	0.0587	10.91	0.00	\$35	\$135	\$45	\$680	\$693	\$748	\$888	\$1,091
4 Saw	\$558	0.0625	10.91	0.00	\$35	\$135	\$45	\$558	\$589	\$634	\$748	\$916
Pulp	\$256	-0.1126	4.50	0.00	\$5	\$25	\$45	\$256	\$258	\$315	\$429	\$566
Black Cottonwood												
2 Saw	\$525	-0.0946	1.75	0.00	\$35	\$135	\$45	\$525	\$476	\$573	\$757	\$992
3 Saw	\$500	-0.0512	2.91	0.00	\$35	\$135	\$45	\$500	\$434	\$529	\$716	\$941
4 Saw/CNS	\$378	-0.0665	2.16	0.00	\$35	\$135	\$45	\$378	\$395	\$478	\$636	\$834
Pulp	\$269	-0.1310	4.75	0.00	\$5	\$25	\$45	\$269	\$217	\$272	\$377	\$499
Douglas-fir												
Export 12"+	\$747	-0.1489	2.50	0.00	\$35	\$135	\$45	\$747	\$789	\$960	\$1,279	\$1,678
Export 8-12"	\$710	-0.1796	2.50	0.00	\$35	\$135	\$45	\$710	\$738	\$910	\$1,215	\$1,595
SM and Better	\$752	-0.1568	3.00	0.00	\$35	\$135	\$45	\$752	\$688	\$879	\$1,199	\$1,577
2 Saw	\$681	-0.1619	3.00	0.00	\$35	\$135	\$45	\$681	\$666	\$854	\$1,167	\$1,534
3 Saw	\$673	-0.1613	3.00	0.00	\$35	\$135	\$45	\$673	\$633	\$812	\$1,109	\$1,459
4 Saw	\$613	-0.1595	3.00	0.00	\$35	\$135	\$45	\$613	\$590	\$755	\$1,031	\$1,356
Chip-n-Saw	\$461	-0.2149	2.66	0.00	\$35	\$135	\$45	\$461	\$390	\$498	\$673	\$884
Pulp	\$269	-0.2527	3.08	0.00	\$5	\$25	\$45	\$269	\$309	\$363	\$481	\$631
Western Redcedar												
Camprun	\$1,155	-0.1110	3.08	0.00	\$35	\$135	\$45	\$1,155	\$1,102	\$1,422	\$1,964	\$2,585
Western Hemlock												
Export 12"+	\$723	-0.1720	3.08	0.00	\$35	\$135	\$45	\$723	\$701	\$827	\$1,095	\$1,437
Export 8-12"	\$745	-0.1792	3.08	0.00	\$35	\$135	\$45	\$745	\$686	\$810	\$1,074	\$1,409
SM and Better	\$600	-0.1195	4.83	0.00	\$35	\$135	\$45	\$600	\$535	\$674	\$943	\$1,252
2 Saw	\$601	-0.1336	4.83	0.00	\$35	\$135	\$45	\$601	\$573	\$732	\$1,033	\$1,373
3 Saw	\$607	-0.1221	4.83	0.00	\$35	\$135	\$45	\$607	\$524	\$662	\$928	\$1,232
4 Saw	\$536	-0.1211	4.83	0.00	\$35	\$135	\$45	\$536	\$482	\$608	\$852	\$1,131
Pulp	\$297	-0.1808	4.58	0.00	\$5	\$25	\$45	\$297	\$301	\$385	\$541	\$717

Parcel: 16N04E0416261028

Stand: 19359150

Market Model: Puget 201402

RPA Portfolio: Cascadia 20140414

Sort         Species Code         Sort Code         2014         2015         2020         2023         2030         2035           2 Saw         RA         H1         \$74.55         \$\$81.03         \$\$85.01         \$\$492.13         \$\$483.10         \$\$548.31         \$\$548.31         \$\$548.31         \$\$548.31         \$\$548.31         \$\$548.31         \$\$548.31         \$\$51.86         \$\$52.38         \$\$91.43         \$\$1.665.54         \$\$2.380.88         \$\$1.451.45         \$\$1.056.54         \$\$2.380.88         \$\$1.066.01         \$\$1	Rotation 1	Rotation 2	Perpetuity	Optimal Combination					
Western Red Alder         Littic         Littic <thlitic< th=""> <t< td=""><td>Sort</td><td>Species Code</td><td>Sort Code</td><td>2014</td><td>2015</td><td>2020</td><td>2025</td><td>2030</td><td>2035</td></t<></thlitic<>	Sort	Species Code	Sort Code	2014	2015	2020	2025	2030	2035
Sam         PA         HL         S7455         S81.03         S85.01         S492.13         S483.10         S548.33           2 Saw         RA         H2         S741.05         S84.44         S14.47.18         S12.02.1         S1.63.54         S2.338.08           3 Saw         RA         H3         S67.02         S720.20         S332.38         S914.34         S81.66.01         S1.08.51.19         S51.092.39         S57.43.15           Pulp         RA         P4         S62.73         S51.88         S74.21         S101.14         S134.67         S43.33           Saw         CW         B2         S52.98         S64.43         S50.60         S75.40         S86.51         S18.7         S1.02.7           Saw         CW         B2         S52.98         S64.43         S50.60         S57.40         S86.51         S1.84.25         S21.43         S28.67         S1.82.09         S97.33         S1.82.80         S18.20         S18.42.5         S21.43         S27.83.1         S1.83.87         S1.83.87 <t< td=""><td>Western Red Alder</td><td>Species code</td><td></td><td>2021</td><td>2025</td><td>2020</td><td>LULD</td><td></td><td>2000</td></t<>	Western Red Alder	Species code		2021	2025	2020	LULD		2000
2 Saw         RA         H2         \$741.05         \$84.34         \$1,407.18         \$1,202.51         \$1,636.54         \$2,338.08           3 Saw         RA         H4         \$2,2490.55         \$3,258.02         \$3,366.94         \$4,511.99         \$5,002.39         \$5,743.15           Pulp         RA         P4         \$5,273         \$51.88         \$74.21         \$101.14         \$51.965.71         \$54.33           Back Cottonwood         2         \$57.90         \$56.23         \$56.60         \$75.40         \$56.37         \$51.82           2 Saw         CW         B1         \$79.90         \$62.38         \$566.80         \$75.40         \$56.37         \$51.82           2 Saw         CW         BP         -	2 Saw	RA	H1	\$74.55	\$81.03	\$85.01	\$492.13	\$483.10	\$548.91
Saw         RA         HB         SG78.02         S770.20         S352.98         S914.34         S810.60         S10.066.10           4 Saw         RA         P4         S2496.55         S22.88.02         S3066.94         S45.11.99         S5092.39         S5092.39         S5092.39         S5092.39         S54.433           Pulp         RA         P4         S267.73         S51.88         S74.21         S101.14         S13.467         S44.33           Saw         CW         B1         S79.90         S62.28         S66.80         S75.40         S66.37         S102.62           Saw         CW         B2         S52.73         S51.71         S7.08         S81.55         S82.87         S11.83           Deugle-fir         Egort 12*         DF         E2         S85.20         S82.42         S184.25         S21.43.3         S278.51         S318.36           Saw         DF         D3         S173.76         S22.46         S33.26         S214.33         S361.3         S563.82           Camprun         RC         C1         S205.05         S210.03         S274.75         S539.14         S648.24         S481.30           Camprun         RC         C2         S75.58 </td <td>2 Saw</td> <td>RA</td> <td>H2</td> <td>\$741.05</td> <td>\$844.34</td> <td>\$1,467,18</td> <td>\$1,202.51</td> <td>\$1,636,54</td> <td>\$2,338,08</td>	2 Saw	RA	H2	\$741.05	\$844.34	\$1,467,18	\$1,202.51	\$1,636,54	\$2,338,08
L Saw RA H4 S2.2465.5 S3.258.02 S3.366.94 S4.511.69 S5.092.39 S5.743.15 Pulp RA P4 S50.73 S51.88 S74.21 S101.14 S134.67 S43.33 Black Cottomwood 2 Saw CW B1 S79.90 S62.38 S66.80 S75.40 S66.37 S102.62 2 Saw CW B2 S52.98 S44.33 S50.69 S53.42 S66.11 S78.16 3 Saw CW BP	3 Saw	RA	H3	\$678.02	\$720.20	\$352.98	\$914.34	\$810.60	\$1,066,10
Dup         EA         P4         S62.73         S51.88         S74.21         S101.14         S134.67         S44.33           2 Saw         CW         B2         S52.98         S42.43         S66.60         S75.40         S86.37         S102.62           2 Saw         CW         B2         S52.98         S44.43         S60.69         S53.62         S66.11         S78.61           2 Saw         CW         BP	4 Saw	RA	H4	\$2,949.55	\$3,258.02	\$3,966,94	\$4,511,99	\$5,092,39	\$5,743.15
Back Cottonwood         N.         Data	Pulp	RA	P4	\$62.73	\$51.88	\$74.21	\$101.14	\$134.67	\$44.33
2 Sw         CW         B1         \$79.90         \$62.38         \$66.80         \$75.40         \$86.37         \$102.2           2 Sw         CW         BP         -	Black Cottonwood				002100		4202121	<i>Q</i> 20 HOI	41100
25w         CW         B2         552.98         544.43         550.69         553.62         566.11         578.87           Pulp         CW         P4         58.75         56.17         57.08         58.15         59.87         51.182           Donglas-fit         D         E         58.75         56.17         57.08         58.15         59.87         511.82           Donglas-fit         DF         E3         54.941         555.42         586.09         532.53         5395.13         5563.82           3 Saw         DF         D4         570.02         578.46         512.09         597.67         511.53         516.66         524.58         533.26         545.19         559.59         575.19           Vestern Redecdar         C         C1         5205.05         5210.03         5274.75         5539.14         5648.24         580.85           Camprun         RC         C1         5205.05         5210.03         5274.75         5539.14         5648.24         580.51         150.24           Camprun         RC         C2         575.58         5120.08         5142.02         577.58         514.241         5400.23         570.58         510.51.4         580.561	2 Saw	CW	B1	\$79.90	\$62.38	\$66.80	\$75.40	\$86.37	\$102.62
3 Saw         CW         PP         Date         Da	2 Saw	CW	B2	\$52.98	\$44.43	\$50.69	\$53.62	\$66.11	\$78.16
Puip         CW         P4         \$8.75         \$6.17         \$7.08         \$8.15         \$9.87         \$11.82           Douglas fir         Eport 12*         DF         E2         \$85.20         \$83.49         \$18.425         \$214.93         \$278.51         \$318.96           Export 32*2         DF         D3         \$173.76         \$222.256         \$276.17         \$338.38         \$501.69         \$58.93.8         \$501.69         \$58.959         \$55.95         \$56.82           3 Saw         DF         D4         \$570.02         \$78.46         \$132.09         \$97.62         \$115.38         \$166.60           Puip         DF         P4         \$26.64         \$24.58         \$332.69         \$57.19         \$55.59         \$75.19           Western Redcedar         C         Camprun         RC         C4         \$570.54         \$210.03         \$274.75         \$539.14         \$648.24         \$881.30           Camprun         RC         C4         \$570.54         \$210.08         \$182.02         \$77.58         \$142.81         \$400.30           Camprun         RC         C4         \$570.54         \$159.46         \$214.59         \$216.52         \$330.69         \$207.710         \$328.41 <td>3 Saw</td> <td>CW</td> <td>BP</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	3 Saw	CW	BP						
Dargigs-fir         Cit         Dark	Pulp	CW	P4	\$8.75	\$6.17	\$7.08	\$8.15	\$9.87	\$11.82
Emort 12**         DF         E2         \$\$5.20         \$\$8.49         \$\$184.25         \$\$214.93         \$\$278.51         \$\$318.66           Export 12**         DF         D3         \$\$173.76         \$\$222.56         \$\$276.17         \$\$338.38         \$\$501.69         \$\$588.85           4 Saw         DF         D3         \$\$173.76         \$\$222.56         \$\$276.17         \$\$338.38         \$\$501.69         \$\$588.85           4 Saw         DF         D4         \$\$70.02         \$\$78.46         \$\$132.09         \$\$97.62         \$\$115.38         \$\$166.60           Camprun         RC         C1         \$\$205.05         \$\$210.03         \$\$274.75         \$\$339.14         \$\$648.24         \$\$881.30           Camprun         RC         C4         \$\$75.58         \$\$120.08         \$\$182.02         \$\$77.58         \$\$142.81         \$400.30           Camprun         RC         C4         \$\$70.52         \$\$337.93         \$548.35         \$\$657.61         \$\$885.61         \$\$10.52.74           Export 12*+         WH         E3         \$\$167.90         \$\$147.13         \$\$34.75         \$\$177.38         \$\$218.25         \$306.41           Saw         MH         D2         \$\$175.58         \$159.46	Douglas-fir		14	40.75	<i><b>40.17</b></i>	\$7.00	\$0.15	45.67	\$11.0L
Eport 8-12"         DF         D3         \$\$173.76         \$\$222.56         \$\$26.09         \$\$223.33         \$\$395.13         \$\$58.85           3 Saw         DF         D4         \$\$173.76         \$\$222.56         \$\$276.17         \$338.38         \$\$305.13         \$\$58.85           Puip         DF         D4         \$\$173.76         \$\$222.56         \$\$276.17         \$338.38         \$\$305.69         \$\$580.85           Puip         DF         D4         \$\$16.46         \$\$24.58         \$\$33.26         \$\$45.19         \$\$59.59         \$\$77.19           Camprun         RC         C1         \$\$205.05         \$\$210.03         \$\$77.475         \$\$39.14         \$648.24         \$\$881.30           Camprun         RC         C2         \$\$75.58         \$120.08         \$\$18.20         \$\$77.58         \$\$142.81         \$400.30           Camprun         RC         C3         -	Export 12"+	DF	E2	\$85.20	\$83.49	\$184.25	\$214.93	\$278.51	\$318.96
3 Saw         DF         D3         \$173.76         \$222.56         \$276.17         \$338.38         \$501.69         \$580.85           4 Saw         DF         D4         \$70.02         \$78.46         \$132.09         \$97.62         \$115.38         \$166.66           Pulp         DF         D4         \$70.02         \$78.46         \$332.6         \$45.19         \$59.59         \$77.19           Western Redcedar         C         C1         \$205.05         \$210.03         \$274.75         \$539.14         \$648.24         \$881.30           Camprun         RC         C1         \$205.05         \$210.03         \$274.75         \$539.14         \$648.24         \$881.30           Camprun         RC         C4         \$75.58         \$120.08         \$182.02         \$77.58         \$142.81         \$400.30           Camprun         RC         C3         \$75.59         \$173.78         \$218.52         \$173.78         \$218.52         \$173.78           Start Hemlock         Egord 12*         WH         E2         \$370.52         \$333.79         \$548.35         \$657.61         \$885.61         \$1,052.74           Start Hemlock         Egord 12*         WH         E2         \$173.79         \$248	Export 8-12"	DF	E3	\$49.41	\$55.42	\$86.09	\$325.33	\$395.13	\$563.82
Saw         DF         D4         S70.02         S78.66         S132.09         S97.62         S115.38         S166.60           Pulp         DF         P4         S16.46         S24.58         S33.26         S45.19         S59.39         S75.19           Western Redcedar         C         C         S205.05         S210.03         S274.75         S539.14         S648.24         S88.130           Camprun         RC         C2         S75.58         S120.08         S182.02         S77.58         S142.81         S408.30           Camprun         RC         C3	3 Saw	DE	D3	\$173.76	\$222.56	\$276.17	\$338.38	\$501.69	\$580.85
Duip         DF         P4         S16.65         S16.75         S17.38         S16.42.81         S40.03           Camprun         RC         C4         S70.55         S10.65         S10.65         S12.75         S17.78         S12.84         S40.03         S66.761         S48.51         S10.67.74           Camprun         RC         C3         -         -         -         -         -         -         70.58         S10.67.74         S10.67.74         S10.67.74         S10.67.74         S10.67.74         S10.67.74         S10.67.74         S10.67.74         S10.67.75         S10.75.76         S10.77.73         S10.67.76         S10.67.71.38         S10.57.76	4 Saw	DE	D4	\$70.02	\$78.46	\$132.09	\$97.62	\$115.38	\$166.60
Cop         Diff         Diff <thdiff< th="">         Diff         Diff         D</thdiff<>	Pulp	DE	D4	\$16.02	\$74.58	\$33.26	\$45.10	\$50.50	\$75.10
Comprun         RC         Cl         \$205.05         \$210.03         \$274.75         \$539.14         \$648.24         \$881.30           Camprun         RC         C2         \$75.58         \$120.08         \$182.02         \$77.58         \$142.81         \$400.30           Camprun         RC         C4         \$70.54         \$36.22         \$101.64         \$291.85         \$275.75         \$177.38         \$218.52         \$107.54         \$36.22         \$101.64         \$291.85         \$218.52         \$206.41         \$105.74         \$36.22         \$101.64         \$291.85         \$218.52         \$306.51         \$105.74           Export 12*         WH         E3         \$167.90         \$147.13         \$34.75         \$177.38         \$218.52         \$306.51           SM and Better         WH         D2         \$1175.98         \$159.46         \$216.90         \$272.10         \$354.91         \$421.52           2 Saw         WH         D2         \$191.25         \$300.69         \$509.64         \$709.02         \$271.00         \$354.91         \$421.22           2 Saw         WH         D3         \$46.66         \$43.42         \$203.95         \$316.58         \$392.74         \$358.64           3 Saw	Western Redcedar	51	14	\$10.40	924.50	\$55.20	\$ <del>+</del> 5.15	00000	475.15
Camprun         RC         C2         S75.58         S120.08         S18.20         S77.58         S14.21         S40.31         C400.30           Camprun         RC         C4         S70.54         S36.22         S101.64         S249.18         S287.57         S178.16           Camprun         RC         C3	Camprup	RC	CI	\$205.05	\$210.03	\$274.75	\$539.14	\$648.24	\$881.30
Camprun         RC         CL         S70.54         S30.23         S10.53         S10.54         S20.25         S10.54         S20.22         S10.51         S20.22         S10.51         S20.22         S10.51         S20.22         S10.52         S10.52         S10.52         S10.52         S10.52         S10.52         S10.52         S10.52         S10.52         S10.51         S20.22         S10.51	Camprun	RC	2	\$75.58	\$120.08	\$182.02	\$77.58	\$142.81	\$400.30
Computin         RC         C3         Jobstit	Camprun	RC	C4	\$70.50	\$36.22	\$101.64	\$2/10.18	\$287.57	\$178.16
Western Hemlock         Signal         Signal <t< td=""><td>Camprun</td><td>RC</td><td>G</td><td>\$70.54</td><td>\$50.22</td><td>\$101.04</td><td>\$245.10</td><td>\$207.57</td><td>\$170.10</td></t<>	Camprun	RC	G	\$70.54	\$50.22	\$101.04	\$245.10	\$207.57	\$170.10
Export 12*+         WH         E2         \$370.52         \$353.79         \$548.35         \$657.61         \$885.61         \$1,052.74           Export 8-12"         WH         E3         \$167.90         \$147.13         \$34.75         \$177.38         \$218.52         \$306.41           SM and Better         WH         D1             \$306.51           2 Saw         MH         D2         \$175.98         \$159.46         \$216.90         \$272.10         \$3354.91         \$421.22           2 Saw         WH         D2   536.82         520.72.07         \$138.60         \$207.26	Western Hemlock	NC	0						
Export 1.2"       WH       E3       S167.90       S147.13       S147.75       S177.38       S218.52       S306.17         S aw       MH       D1             S70.58         2 Saw       MH       D2       \$175.98       \$159.46       \$216.90       \$272.10       \$354.91       \$421.22         2 Saw       WH       D2       \$191.25       \$330.69       \$509.64       \$709.02       \$902.82       \$1,795.51         2 Saw       WP       D2 <td>Export 12"+</td> <td>WH</td> <td>F2</td> <td>\$370.52</td> <td>\$353.70</td> <td>\$548.35</td> <td>\$657.61</td> <td>\$885.61</td> <td>\$1.052.74</td>	Export 12"+	WH	F2	\$370.52	\$353.70	\$548.35	\$657.61	\$885.61	\$1.052.74
Chipmond Retter       With       D1	Export 8-12"	WH	E2 E3	\$167.90	\$147.13	\$34.75	\$177.38	\$218.52	\$306.41
Difference     MH     D2     \$175.98     \$159.46     \$216.90     \$272.10     \$354.91     \$421.22       2 Saw     WH     D2     \$191.25     \$330.69     \$509.64     \$709.02     \$902.82     \$1,795.51       2 Saw     WP     D2              3 Saw     MH     D3     \$46.66     \$43.42     \$203.95     \$316.58     \$392.74     \$536.82       3 Saw     WP     D3     \$10.51     \$8.66     \$72.07     \$138.60     \$207.26     \$271.87       3 Saw     WH     D3     \$684.02     \$614.49     \$994.53     \$1,553.33     \$2,111.69     \$2,305.06       3 Saw     UP     D3           \$56.90     \$64.12       4 Saw     WH     D4     \$202.72     \$194.92     \$301.63     \$312.14     \$489.20     \$660.67       Chip-n-Saw     MH     CS          \$29.02     \$47.53       Pulp     WP     P4     \$0.63     \$0.67     \$5.51     \$10.48     \$18.62     \$27.51       Chip-n-Saw     MH     P4     \$90.68     \$110.65     \$165.01 <td< td=""><td>SM and Better</td><td>WH</td><td>D1</td><td>\$107.50</td><td>\$147.15</td><td></td><td>\$177.50</td><td>\$210.5Z</td><td>\$70.58</td></td<>	SM and Better	WH	D1	\$107.50	\$147.15		\$177.50	\$210.5Z	\$70.58
2 Sow         WH         D2         \$175.50         \$175.50         \$125.50         \$126.50         \$276.10         \$306.10 <td>2 Saw</td> <td>MH</td> <td>D2</td> <td>\$175.08</td> <td>\$150.46</td> <td>\$216.00</td> <td>\$272.10</td> <td>\$354.01</td> <td>\$421.22</td>	2 Saw	MH	D2	\$175.08	\$150.46	\$216.00	\$272.10	\$354.01	\$421.22
2 Saw         WP         D2         151.15         350.05         350.05         350.05         350.02	2 Saw	WH	D2	\$101.25	\$330.60	\$500.64	\$700.02	\$002.82	\$1 705 51
Jaw         WH         D2         MH         D3         \$46.66         \$43.42         \$203.95         \$316.58         \$392.74         \$536.82           3 Saw         WP         D3         \$10.51         \$8.66         \$77.07         \$138.60         \$207.26         \$271.87           3 Saw         WH         D3         \$684.02         \$614.49         \$994.53         \$1,553.33         \$2,111.69         \$2,305.06           3 Saw         LP         D3             \$56.90         \$664.12           4 Saw         WH         D4         \$202.72         \$194.92         \$301.63         \$312.14         \$489.20         \$660.67           Chip-n-Saw         WH         D4         \$202.72         \$194.92         \$301.63         \$312.14         \$489.20         \$66.66.67           Chip-n-Saw         MH         CS         \$57.34         \$62.34         \$25.65         \$164.38         \$224.10         \$275.19           Chip-n-Saw         WP         P4         \$90.68         \$110.65         \$165.01         \$234.38         \$317.69         \$416.29           Pulp         WH         P4         \$90.68         \$110.65         \$165.01         \$	2 5800	WD	D2	\$151.25	\$550.05	\$505.04	\$705.02	\$502.02	\$1,755.51
3 Saw       WP       D3       \$10,50       \$45,42       \$12,535       \$35,50       \$35,514       \$35,50         3 Saw       WP       D3       \$10,51       \$8,66       \$72,07       \$138,60       \$207,26       \$271,87         3 Saw       WH       D3       \$684,02       \$614,49       \$994,53       \$1,553,33       \$2,111,69       \$2,305,06         3 Saw       LP       D3          *-       \$56,90       \$64,12         4 Saw       WH       D4       \$202,72       \$194,92       \$301,63       \$312,14       \$489,20       \$660,67         Chip-n-Saw       MH       CS       \$57,34       \$62,34       \$255,55       \$164,38       \$224,10       \$275,19         Chip-n-Saw       WP       CS          *       \$29,02       \$47,53         Pulp       WP       P4       \$0,63       \$0,67       \$5,51       \$10,48       \$18,62       \$22,35         Pulp       WH       P4       \$90,68       \$110,65       \$165,01       \$234,38       \$317,69       \$416,29         Pulp       MH       P4       \$19,31       \$19,84       \$313,31       \$57,25	2 Saw	MH	D2	\$46.66	\$43.42	\$203.05	\$316.58	\$302.74	\$536.82
J Solve       WH       D3       J Solve       J	3 5344	W/D	53	\$10.51	\$8.66	\$72.07	\$128.60	\$207.26	\$330.02
Solv       WH       D3       3000000000000000000000000000000000000	3 5344	WH	D3	\$684.02	\$614.40	\$00/ 53	\$1 552 22	\$2 111 60	\$2,305,06
J Solv       LP       D3       LP       D4       Store       Store       LP       D4       Store       Store       Store       Store       Store       Control       Store	3 5344	ID	53	\$004.0Z	\$014.45		\$1,555.55	\$56.00	\$64.12
4 3dV       WT       D4       3202.72       3134.32       3301.03       312.14       3403.20       3000.07         Chip-n-Saw       MH       CS       \$57.34       \$62.34       \$25.65       \$164.38       \$224.10       \$275.19         Chip-n-Saw       WP       CS            \$29.02       \$47.53         Pulp       WP       P4       \$0.63       \$0.67       \$5.51       \$10.48       \$18.62       \$225.35         Pulp       WH       P4       \$90.68       \$110.65       \$165.01       \$234.38       \$317.69       \$416.29         Pulp       MH       P4       \$19.31       \$19.84       \$31.31       \$57.25       \$73.78       \$93.58         Pulp       LP       P4       \$19.31       \$19.84       \$31.31       \$57.25       \$73.78       \$93.58         Pulp       LP       P4       \$19.31       \$19.84       \$31.31       \$57.25       \$73.78       \$93.58         Pulp       LP       P4       \$19.31       \$19.84       \$31.31       \$57.25       \$73.78       \$93.58         Pulp       LP       P4 <t< td=""><td>4 5 3 4 4</td><td></td><td>DI</td><td>\$202.72</td><td>\$104.02</td><td>\$201.62</td><td>\$212.14</td><td>\$10.30</td><td>\$660.67</td></t<>	4 5 3 4 4		DI	\$202.72	\$104.02	\$201.62	\$212.14	\$10.30	\$660.67
Chip-in-Saw         WP         CS             \$224.30         \$224.30         \$224.30         \$224.30         \$224.30         \$224.30         \$224.30         \$224.30         \$224.30         \$224.30         \$224.30         \$224.30         \$224.30         \$224.30         \$224.31         \$229.02         \$47.53         \$10.48         \$18.62         \$253.55         \$10.48         \$18.62         \$253.55         \$10.48         \$18.62         \$253.55         \$10.48         \$18.62         \$253.55         \$10.48         \$18.62         \$253.55         \$10.48         \$18.62         \$253.55         \$10.48         \$18.62         \$253.55         \$10.48         \$110.65         \$10.48         \$110.48         \$110.45         \$24.33         \$27.55         \$73.78         \$293.58         \$24.27         \$416.29         \$10.90         \$14.316         \$17.616         \$22,180         \$416.29         \$10.91         \$10.48         \$13.56.53         \$10.926.33         \$17.616         \$22,180         \$44.27         \$44.80           Value-Cost         \$7,640         \$8,182         \$10,790         \$14,316         \$17.616         \$22,180           Additional Costs         \$596.76         \$630.97         \$763.51         \$939.29	4 Jaw Chin-n-Saw	MH	CS	\$57.24	\$62.34	\$25.65	\$164.28	\$224.10	\$275.10
Chiperinaw         WP         Cd         Chiperina         Chiperina <thchiperina< th="">         Chiperina         Chiperina<td>Chip-n-Saw</td><td>W/D</td><td>C5</td><td>\$37.34</td><td>\$U2.54</td><td>\$25.05</td><td>\$104.50</td><td>\$20.02</td><td>\$47.52</td></thchiperina<>	Chip-n-Saw	W/D	C5	\$37.34	\$U2.54	\$25.05	\$104.50	\$20.02	\$47.52
Pulp         WH         P4         \$30.07         \$3.51         \$10.46         \$36.02         \$32.53           Pulp         WH         P4         \$90.68         \$110.65         \$165.01         \$234.38         \$317.69         \$416.29           Pulp         MH         P4         \$19.31         \$19.84         \$31.31         \$57.25         \$73.78         \$93.58           Pulp         LP         P4            \$427         \$4.80           Value-Cost         \$7,640         \$8,182         \$10,790         \$14,316         \$17,616         \$22,180           Additional Costs         \$596.76         \$630.97         \$763.51         \$939.29         \$1,126.49         \$1,356.53           Periodic NET Revenue         \$7,043.53         \$7,550.63         \$10,026.83         \$13,377.11         \$16,489.25         \$20,823.86           Acre Adjustment FV         \$199,500.96         \$213,864.25         \$284,000.10         \$378,893.28         \$467,041.64         \$589,815.24           NPV         \$199,500.96         \$202,451.50         \$204,369.16         \$207,265.88         \$194,214.02         \$186,446.83	Dulp	WD	C3	\$0.62	\$0.67	¢5 51	\$10.49	\$25.02	\$47.JJ \$25.25
Pulp       MH       P4       \$50.05       \$110.05       \$10.01       \$234.35       \$317.05       \$410.25         Pulp       MH       P4       \$19.31       \$19.84       \$31.31       \$57.25       \$73.78       \$93.58         Pulp       LP       P4           \$1.05       \$17.66       \$22.38         Value-Cost       \$7,640       \$8,182       \$10,700       \$14,316       \$17,616       \$22.180         Additional Costs       \$596.76       \$630.97       \$763.51       \$939.29       \$1,126.49       \$1,356.53         Periodic NET Revenue       \$7,043.53       \$7,550.63       \$10,026.83       \$13,377.11       \$16,489.25       \$208,238.64         Acre Adjustment FV       \$199,500.96       \$213,864.25       \$284,000.10       \$378,893.28       \$467,041.64       \$589,815.24         NPV       \$199,500.96       \$202,451.50       \$204,369.16       \$207,265.88       \$194,214.02       \$186,446.83	Pulp	WH	P4	\$0.05	\$0.07	\$1.51	\$10.40	\$10.02	\$23.33
Pulp         LP         P4         319.31         319.64         351.51         377.23         375.76         395.36           Pulp         LP         P4             \$17.76         \$95.36           Value-Cost         \$7,640         \$8,182         \$10,790         \$14,316         \$17,616         \$22,180           Additional Costs         \$56,760         \$630.97         \$763.51         \$939.29         \$1,126.49         \$1,356.53           Periodic NET Revenue         \$7,043.53         \$7,550.63         \$10,026.83         \$13,377.11         \$16,489.25         \$208,283.86           Acre Adjustment FV         \$199,500.96         \$213,864.25         \$204,000.10         \$378,893.28         \$467,041.64         \$589,815.24           NPV         \$199,500.96         \$202,451.50         \$204,369.16         \$207,265.88         \$194,214.02         \$186,446.83	Pulp		P4	\$90.00	\$110.03	\$103.01	\$Z04.00 \$57.05	\$517.09	\$410.29
Puip         LP         P4         L         L         L         L         L         S4.27         \$4.30           Value-Cost         \$7,640         \$8,182         \$10,790         \$14,316         \$17,616         \$22,180           Additional Costs         \$596,76         \$630,97         \$763,51         \$939,29         \$1,126,49         \$1,356,53           Periodic NET Revenue         \$7,043,53         \$7,550,63         \$10,026,83         \$13,377,11         \$16,489,25         \$20,823,86           Acre Adjustment FV         \$199,500,96         \$213,864,25         \$284,000,10         \$378,893,28         \$467,041,64         \$589,815,24           NPV         \$199,500,96         \$202,451,50         \$204,369,16         \$207,265,88         \$194,214,02         \$186,446,83	Pulp		P4	\$19.51	\$19.04	\$51.51	\$J1.2J	\$13.10 ¢137	\$2.00
Value-Cost         \$7,640         \$8,182         \$10,790         \$14,316         \$17,616         \$22,180           Additional Costs         \$596,76         \$630,97         \$763,51         \$939,29         \$1,126,49         \$1,356,53           Periodic NET Revenue         \$7,043,53         \$7,550,63         \$10,026,83         \$13,377,11         \$16,489,25         \$288,815,22           Acre Adjustment FV         \$199,500,96         \$213,864,25         \$284,000,10         \$378,893,28         \$467,041,64         \$589,815,24           NPV         \$199,500,96         \$202,451,50         \$204,369,16         \$207,265,88         \$194,214,02         \$186,446,83	Pulp	LF	P4					\$4.27	\$ <b>4.0</b> 0
Additional Costs         \$596.76         \$630.97         \$763.51         \$939.29         \$1,126.49         \$1,356.53           Periodic NET Revenue         \$7,043.53         \$7,550.63         \$10,026.83         \$13,377.11         \$16,489.25         \$20,823.86           Acre Adjustment FV         \$199,500.96         \$213,864.25         \$284,000.10         \$378,893.28         \$467,041.64         \$589,815.24           NPV         \$199,500.96         \$202,451.50         \$204,369.16         \$207,265.88         \$194,214.02         \$186,446.83	Value-Cost			\$7,640	\$8,182	\$10,790	\$14,316	\$17,616	\$22,180
Periodic NET Revenue         \$7,043.53         \$7,550.63         \$10,026.83         \$13,377.11         \$16,489.25         \$20,823.86           Acre Adjustment FV         \$199,500.96         \$213,864.25         \$284,000.10         \$378,893.28         \$467,041.64         \$589,815.24           NPV         \$199,500.96         \$202,451.50         \$204,369.16         \$207,265.88         \$194,214.02         \$186,446.83	Additional Costs			\$596.76	\$630.97	\$763.51	\$939.29	\$1,126.49	\$1,356.53
Acre Adjustment FV         \$199,500.96         \$213,864.25         \$284,000.10         \$378,893.28         \$467,041.64         \$589,815.24           NPV         \$199,500.96         \$202,451.50         \$204,369.16         \$207,265.88         \$194,214.02         \$186,446.83	Periodic NET Revenue			\$7,043.53	\$7,550.63	\$10,026.83	\$13,377.11	\$16,489.25	\$20,823.86
NPV \$199,500.96 \$202,451.50 \$204,369.16 \$207,265.88 \$194,214.02 \$186,446.83	Acre Adjustment FV			\$199,500.96	\$213,864.25	\$284,000.10	\$378,893.28	\$467,041.64	\$589,815.24
	NPV	<b>A</b>		\$199,500.96	\$202,451.50	\$204,369.16	\$207,265.88	\$194,214.02	\$186,446.83

NPV Max Optimal Relation Year \$207,266

2025

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#### R1 For StandID: 19359150 From 2014 - 2210

![](_page_28_Figure_2.jpeg)

![](_page_29_Picture_0.jpeg)

Parcel: 16N04E0416261028 Stand: 19359150

Market Model: Puget 201402

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RPA Portfolio: Cascadia 20140414

Rotation 1	Rotation 2	Perpetuity	Optim	al Combination				
©0 Sort Western Red Alder Black Cottonwood	Species Code	Sort Code	45	50	55	60	65	70
Douglas-fir				¢007.00	¢2.004.22	¢2 467 90	¢4 526 22	¢7.262.02
Export 12"+	DF	E2		\$827.99	\$2,084.22	\$3,407.80	\$4,520.32	\$7,303.03
Export 8-12"	DF	E3	\$1,556.45	\$1,890.72	\$3,287.22	\$6,597.75	\$7,679.62	\$10,067.84
3 Saw	DF	D3	\$7,828.70	\$9,789.78	\$11,043.77	\$13,637.39	\$17,980.39	\$20,749.44
4 Saw	DF	D4	\$2,307.14	\$3,246.00	\$3,748.74	\$3,662.64	\$3,333.30	\$3,511.78
Pulp	DF	P4	\$732.13	\$976.82	\$1,217.79	\$1,598.77	\$1,943.27	\$2,373.88
Western Redcedar								
Camprun	RC	C1		\$923.37	\$2,447.63	\$2,790.93	\$4,088.16	\$6,128.64
Camprun	RC	C2	\$2,049.92	\$1,713.67	\$1,188.11	\$1,342.24	\$1,510.49	\$1,599.23
Camprun	RC	C4	\$358.27	\$913.34	\$1,269.07	\$1,637.42	\$2,073.38	\$1,653.33
Western Hemlock								
Export 12"+	WH	E2		\$3,284.77	\$4,369.15	\$11,516.89	\$15,483.87	\$20,182.20
Export 8-12"	WH	E3	\$5,438.58	\$5,864.34	\$10,388.04	\$8,414.06	\$11,226.39	\$19,893.86
3 Saw	WH	D3	\$5,419.42	\$5,951.68	\$7,168.72	\$10,179.41	\$13,705.38	\$12,533.40
4 Saw	WH	D4	\$1,743.79	\$2,160.55	\$2,076.85	\$1,681.04	\$1,769.75	\$2,415.72
Pulp	WH	P4	\$1,406.85	\$1,832.83	\$2,403.73	\$3,112.92	\$4,095.39	\$5,089.52
Value-Cost			\$28,841	\$39,376	\$52,693	\$69,639	\$89,416	\$113,562
Additional Costs			\$2,551.48	\$3,144.66	\$3,842.34	\$4,733.68	\$5,794.69	\$6,958.30
Acre Adjustment FV		\$	744,631.67	\$1,026,213.15	\$1,383,647.10	\$1,838,386.01	\$2,368,482.41	\$3,019,440.31
NPV			\$63,120.14	\$66,126.89	\$67,776.62	\$68,455.02	\$67,042.91	\$64,971.54
NPV Max	\$68,455							
Optimal Notation Leng	th 60							

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#### R2 For StandID: 19359150 Over 200 with 0 years Offset

![](_page_30_Figure_2.jpeg)

![](_page_31_Picture_0.jpeg)

 Parcel:
 16N04E0416261028

 Stand:
 19359150

 Market Model:
 Puget 201402

RPA Portfolio: Cascadia 20140414

Rotation 1	Rotation 2		Perpetuity	Optimal Co	Optimal Combination				
Sort Western Red Alder	Species Code	Sort	35	40	45	50	55	60	65
Black Cottonwood									
Douglas-fir									
Export 12"+	DF	E2				\$1,251.74	\$3,150.86	\$5,242.52	\$6,842.77
Export 8-12"	DF	E3		\$667.58	\$2,444.23	\$2,969.18	\$5,162.23	\$10,361.07	\$12,060.03
3 Saw	DF	D3	\$7,648.34	\$10,430.27	\$13,326.92	\$16,665.31	\$18,800.00	\$23,215.17	\$30,608.35
4 Saw	DF	D4	\$1,028.87	\$2,924.26	\$4,270.25	\$6,007.96	\$6,938.48	\$6,779.12	\$6,169.54
Pulp	DF	P4	\$444.38	\$721.36	\$1,022.54	\$1,364.30	\$1,700.85	\$2,232.95	\$2,714.11
Western Redcedar									
Camprun	RC	C1				\$1,139.95	\$3,021.72	\$3,445.54	\$5,047.04
Camprun	RC	C2		\$1,837.70	\$2,530.73	\$2,115.61	\$1,466.78	\$1,657.06	\$1,864.77
Camprun	RC	C4	\$1,186.55	\$191.83	\$442.30	\$1,127.57	\$1,566.73	\$2,021.48	\$2,559.69
Western Hemlock									
Export 12"+	WH	E2				\$5,390.33	\$7,169.46	\$18,898.02	\$25,407.24
Export 8-12"	WH	E3		\$2,428.14	\$8,670.85	\$9,348.48	\$16,558.99	\$13,412.13	\$17,894.89
3 Saw	WH	D3	\$7,305.15	\$10,838.77	\$11,556.61	\$12,695.93	\$15,294.19	\$21,718.60	\$29,242.18
4 Saw	WH	D4	\$1,877.39	\$2,406.42	\$4,477.37	\$5,550.12	\$5,336.14	\$4,319.51	\$4,547.61
Pulp	WH	P4	\$734.61	\$1,210.06	\$1,846.39	\$2,405.51	\$3,154.83	\$4,085.64	\$5,375.11
Total Future Value Sta	nd		\$545,411.23	\$921,845.15	\$1,396,854.67	\$1,885,702.44	\$2,482,709.32	\$3,270,834.42	\$4,196,097.75
Current SEV Value	A _		\$93,759.49	\$115,695.82	\$129,373.70	\$129,879.62	\$127,877.06	\$126,504.96	\$122,235.93
			•						

SEV Rotation Optimum \$129,880 Optimal Rotation Length 50

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#### SEV For StandID: 19359150 Over 200 Years

![](_page_32_Figure_2.jpeg)

## **Sequential Quadratic Programming**

Parcel: 16N04E0416261028

Stand: 19359150

Market Model: Puget 201402

**RPA Portfolio:** Cascadia 20140414

![](_page_33_Figure_6.jpeg)

"Cut Rotation 1" in 2025 was the <u>one rotation optimum</u>. Rotation 2: 60 Years was the <u>one rotation optimum</u> When discounted, R2 "improved" to 45 years.

## **Sequential Quadratic Programming**

Stand: 19838190

Market Model: Puget 201402

RPA Portfolio: Cascadia 20140414

Rotation 1		Rotation 2	Perpe	tuity	Optimal Combination				
	Total	R1	R2 Year	R2	SEV (50)				
	This harvests R1 in 2025								
	\$250,435.30	\$207,265.88	30 (2055)	\$10,677.67	\$32,491.75				
	\$261,726.89	\$207,265.88	35 (2060)	\$26,173.39	\$28,287.61				
	\$266,865.96	\$207,265.88	40 (2065)	\$34,972.63	\$24,627.45				
	\$270,353.81	\$207,265.88	45 (2070)	\$41,647.04	\$21,440.88				
	\$269,567.23	\$207,265.88	50 (2075)	\$43,634.72	\$18,666.63				
	\$268,241.71	\$207,265.88	55 (2080)	\$44,724.49	\$16,251.34				
	\$266,586.88	\$207,265.88	60 (2085)	\$45,172.43	\$14,148.56				
	\$263,824.44	\$207,265.88	65 (2090)	\$44,240.69	\$12,317.87				
	\$260,863.80	\$207,265.88	70 (2095)	\$42,873.87	\$10,724.05				
	\$257,120.00	\$207,265.88	75 (2100)	\$40,517.66	\$9,336.45				
	\$253,466.91	\$207,265.88	80 (2105)	\$38,072.63	\$8,128.40				
	\$248,715.43	\$207,265.88	85 (2110)	\$34,372.89	\$7,076.66				
	\$245,609.30	\$207,265.88	90 (2115)	\$32,182.41	\$6,161.00				
	\$242,169.73	\$207,265.88	95 (2120)	\$29,540.02	\$5,363.83				
	\$238,672.11	\$207,265.88	100 (2125)	\$26,736.43	\$4,669.80				
	\$235,800.49	\$207,265.88	105 (2130)	\$24,469.04	\$4,065.57				
	\$232,445.73	\$207,265.88	110 (2135)	\$21,640.33	\$3,539.52				
	\$229,830.38	\$207,265.88	115 (2140)	\$19,482.96	\$3,081.54				

## **Sequential Quadratic Programming**

Parcel: 16N04E0416261028

Stand: 19359150

Market Model: Puget 201402

RPA Portfolio: Cascadia 20140414

Rotation 1	Rotation 2	Perpetuity	Optimal Com	bination	
Total R This harvests R1 ii 2014	1 R2	Year R2	SEV	(50)	
\$265,006.74	\$199,500.96	30 (2044)	\$16,267.43	\$49,238.3	4
\$282,090.10	\$199,500.96	35 (2049)	\$39,721.79	\$42,867.3	5
\$289,843.91	\$199,500.96	40 (2054)	\$53,022.24	\$37,320.7	0
\$295,112.85	\$199,500.96	45 (2059)	\$63,120.14	\$32,491.7	5
\$293,915.46	\$199,500.96	50 (2064)	\$66,126.89	\$28,287.6	1
\$291,905.03	\$199,500.96	55 (2069)	\$67,776.62	\$24,627.4	5
\$289,396.87	\$199,500.96	60 (2074)	\$68,455.02	\$21,440.8	8
\$285,210.49	\$199,500.96	65 (2079)	\$67,042.91	\$18,666.6	3
\$280,723.84	\$199,500.96	70 (2084)	\$64,971.54	\$16,251.3	4
\$275,050.43	\$199,500.96	75 (2089)	\$61,400.91	\$14,148.5	6

Rotation 1: Originally harvested in 2025 with NPV \$207,266 Rotation 2: Originally was 60 years with NPV \$45,172 **Continuously Extended Optimum: in 2014/45/50** 

![](_page_36_Figure_0.jpeg)

![](_page_36_Figure_1.jpeg)

![](_page_36_Picture_2.jpeg)

![](_page_37_Picture_0.jpeg)

### Agenda

### In a short amount of time, we will take a long walk together

![](_page_37_Figure_3.jpeg)

## **Looking Forward**

<sup>2</sup>uget 201402

Generate Full Parcel Report

View Market Value Repo

Export to PDF

View Stand Report || 19838190

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### **Future Nominal Prices**

Landowner Discount New Logging Road Market Model Name **RPA Portfolio Name Rate of Inflation** Reforestation Cost Access Fee (Timber) **Maintenance Fee** Rate Construction Puget 201402 Cascadia 20140414 2.75% 2.81% \$375/Acre \$0.50/MBF/Mile \$1.33/MBF/Mile \$19,500/Mile Overhead & Projected Delivered Log Value Sort Market Value RPA Longevity Term Logging Cost Hauling Cost Profit & Risk Administration 2015 2020 2030 2014 2040 Western Red Alder 2 Saw \$716 0.0716 10.91 0.00 \$35 \$135 \$45 \$716 \$758 \$810 \$945 \$1,147 3 Saw \$680 0.0587 0.00 \$135 10.91 \$35 \$45 \$693 \$748 \$888 \$1,091 \$680 \$558 4 Saw 0.0625 10.91 0.00 \$35 \$135 \$45 \$589 \$558 \$634 \$748 \$916 \$256 \$5 \$25 Pulp -0.11264.50 0.00 \$45 \$256 \$258 \$315 \$429 \$566 Black Cottonwood 2 Saw \$525 -0.0946 1.75 0.00 \$35 \$135 \$45 \$525 \$476 \$573 \$757 \$992 \$529 3 Saw \$500 -0.0512 2.91 0.00 \$35 \$135 \$45 \$500 \$434 \$716 \$941 4 Saw/CNS \$378 -0.0665 2.16 0.00 \$35 \$135 \$45 \$395 \$478 \$636 \$834 \$378 Pulp \$269 -0.1310 4.75 0.00 \$5 \$25 \$45 \$269 \$217 \$272 \$377 \$499 Douglas-fir Export 12"+ \$747 -0.1489 2.50 0.00 \$35 \$135 \$45 \$789 \$960 \$1.279 \$1.678 \$747 Export 8-12" \$710 -0.1796 2.50 0.00 \$35 \$135 \$45 \$710 \$738 \$910 \$1,215 \$1,595 SM and Better \$752 -0.1568 3.00 0.00 \$35 \$135 \$45 \$688 \$879 \$1,199 \$1,577 \$752 2 Saw \$681 -0.1619 3.00 0.00 \$35 \$135 \$45 \$681 \$666 \$854 \$1,167 \$1,534 3 Saw \$673 -0.16133.00 0.00 \$35 \$135 \$45 \$673 \$633 \$812 \$1.109 \$1.459 4 Saw \$613 -0.15953.00 0.00 \$35 \$135 \$45 \$613 \$590 \$755 \$1.031 \$1.356 \$461 -0.2149 2.66 \$35 \$135 \$45 \$390 \$498 \$673 Chip-n-Saw 0.00 \$461 \$884 Pulp \$269 -0.2527 3.08 0.00 \$5 \$25 \$45 \$309 \$363 \$481 \$269 \$631 Western Redcedar Camprun \$1,155 -0.1110 3.08 0.00 \$135 \$45 \$1,155 \$1,102 \$1,422 \$1,964 \$2,585 \$35 Western Hemlock Export 12"+ \$723 -0.17203.08 0.00 \$35 \$135 \$45 \$723 \$701 \$827 \$1,095 \$1,437 Export 8-12" \$745 -0.17923.08 0.00 \$35 \$135 \$45 \$745 \$686 \$810 \$1.074 \$1.409 SM and Better \$600 -0.1195 4.83 0.00 \$35 \$135 \$45 \$600 \$535 \$674 \$943 \$1,252 2 Saw \$601 -0.1336 4.83 0.00 \$35 \$135 \$45 \$601 \$573 \$732 \$1,033 \$1,373 3 Saw \$607 -0.1221 4.83 0.00 \$35 \$135 \$45 \$607 \$524 \$662 \$928 \$1,232 4 Saw \$536 -0.1211 4.83 0.00 \$35 \$135 \$45 \$536 \$482 \$608 \$852 \$1,131 Pulp \$297 -0.1808 4.58 0.00 \$5 \$25 \$45 \$301 \$385 \$541 \$717 \$297

## **Your e-Parcel Report**

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📧 Forest Resource Analysis S 🗴

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FORE	st <b>R</b> esource	Analysis Sy	stem <b>S</b> oftw/	ARE						
Home Locator 1	Interactive Map Parcel	s Owners Market	Models My Reports	Users Admin Logout						
Export to PDF	NW Pacific Rim	Cascadia 201311	Apply Market Model with RPA Portfolio							
Forest Resource Analy Delivered Log Market	/sis System Software Reporting System: Model - NW Pacific Rim: Cascadia 201311									
Generated By	Generated By William Schlosser			4/23/2014						
Parcel Number:	16N04E0416351088	Acres	19.9							
This parcel may be marginal in size needed to represent a commercial timber production parcel. Caution should applied in reference to timber production costs for this parcel.										
Township:     16N       Range     04E										
								Section	35	
County	Pierce County		Legal Description	W <sup>1</sup> / <sub>2</sub> SE <sup>1</sup> / <sub>4</sub> NW <sup>1</sup> / <sub>4</sub> , Sec. 35, T16N R04E WM						
Threatened, Endangered & Sensitive Species Habitat										
Marbled Murrelet, (	Brachyramphus marmor	<b>Caution:</b> Timber harvest timing may be restricted to times when the species is not nesting.								
Northern Spotted C	Owl, (Strix occidentalis co	No restrictions apply								
American Bald Eagl	e, (Haliaeetus leucoceph	alus)		No restrictions apply						
Existing Roads on Parcel										
Road Type			Feet	Miles						
Surface Roads:										

## **Looking Forward**

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Durat 201402

Minus Manhat Malua Dan ant

view iviarket value	Report	Puget 201402												
View Stand Report	19838190													
Export to DDE	Concrete Full Der	col Papar	7	FUTUI					<b>7</b> 6-	5				
				andowner Discount						New I	ogging	Road		
Market Model Na	Market Model Name RPA Portfolio Name		Rate of Inflation Rate		Reforestation Cost Access Fee (Timber)		ber) N	Maintenance Fee Co		Const	Construction			
Puget 201402	Cascad	ia 20140414	2.75%	2.81%	\$375/Acre	\$0.50/MBF/Mile	\$	1.33/MBF/Mil	e	\$19,50	0/Mile			
Sort	Market Value	RPA	Longevity Terr	n Profit & Risk	Overhead &	Logging Cost	Haulin	a Cost	Projec	ted De	livered	Log Val	ue	
Solt	market value	0.0	Longevity ren		Administration	Logging cost	Theattin	geost	2014	2015	2020	2030	2040	
Western Red Alder														
2 Saw	\$716	0.0716	10.91	0.00	\$35	\$135	\$45		\$716	\$758	\$810	\$945	\$1,147	
3 Saw	\$680	0.0587	10.91	0.00	\$35	\$135	\$45		\$680	\$693	\$748	\$888	\$1,091	
4 Saw	\$558	0.0625	10.91	0.00	\$35	\$135	\$45		\$558	\$589	\$634	\$748	\$916	
Pulp	\$256	-0.1126	4.50	0.00	\$5	\$25	\$45		\$256	\$258	\$315	\$429	\$566	
Black Cottonwood														
2 Saw	\$525	-0.0946	1.75	0.00	\$35	\$135	\$45		\$525	\$476	\$573	\$757	\$992	
3 Saw	\$500	-0.0512	2.91	0.00	\$35	\$135	\$45		\$500	\$434	\$529	\$716	\$941	
4 Saw/CNS	\$378	-0.0665	2.16	0.00	\$35	\$135	\$45		\$378	\$395	\$478	\$636	\$834	
Pulp	\$269	-0.1310	4.75	0.00	\$5	\$25	\$45		\$269	\$217	\$272	\$377	\$499	
Douglas-fir														
Export 12"+	\$747	-0.1489	2.50	0.00	\$35	\$135	\$45		\$747	\$789	\$960	\$1,279	\$1,678	
Export 8-12"	\$710	-0.1796	2.50	0.00	\$35	\$135	\$45		\$710	\$738	\$910	\$1,215	\$1,595	
SM and Better	\$752	-0.1568	3.00	0.00	\$35	\$135	\$45		\$752	\$688	\$879	\$1,199	\$1,577	
2 Saw	\$681	-0.1619	3.00	0.00	\$35	\$135	\$45		\$681	\$666	\$854	\$1,167	\$1,534	
3 Saw	\$673	-0.1613	3.00	0.00	\$35	\$135	\$45		\$673	\$633	\$812	\$1,109	\$1,459	
4 Saw	\$613	-0.1595	3.00	0.00	\$35	\$135	\$45		\$613	\$590	\$755	\$1,031	\$1,356	
Chip-n-Saw	\$461	-0.2149	2.66	0.00	\$35	\$135	\$45		\$461	\$390	\$498	\$673	\$884	
Pulp	\$269	-0.2527	3.08	0.00	\$5	\$25	\$45		\$269	\$309	\$363	\$481	\$631	
Western Redcedar														
Camprun	\$1,155	-0.1110	3.08	0.00	\$35	\$135	\$45		\$1,155	\$1,102	\$1,422	\$1,964	\$2,585	
Western Hemlock														
Export 12"+	\$723	-0.1720	3.08	0.00	\$35	\$135	\$45		\$723	\$701	\$827	\$1,095	\$1,437	
Export 8-12"	\$745	-0.1792	3.08	0.00	\$35	\$135	\$45		\$745	\$686	\$810	\$1,074	\$1,409	
SM and Better	\$600	-0.1195	4.83	0.00	\$35	\$135	\$45		\$600	\$535	\$674	\$943	\$1,252	
2 Saw	\$601	-0.1336	4.83	0.00	\$35	\$135	\$45		\$601	\$573	\$732	\$1,033	\$1,373	
3 Saw	\$607	-0.1221	4.83	0.00	\$35	\$135	\$45		\$607	\$524	\$662	\$928	\$1,232	
4 Saw	\$536	-0.1211	4.83	0.00	\$35	\$135	\$45		\$536	\$482	\$608	\$852	\$1,131	
Pulp	\$297	-0.1808	4.58	0.00	\$5	\$25	\$45		\$297	\$301	\$385	\$541	\$717	

![](_page_41_Picture_0.jpeg)

![](_page_42_Picture_0.jpeg)

![](_page_42_Picture_1.jpeg)

Mary takes step one, Joe builds on it, Jane brings in new insights Kelly approves the forecasts and the values are used for harvest timing & shareholder reports.

![](_page_43_Picture_0.jpeg)

### Agenda

### In a short amount of time, we will take a long walk together

![](_page_43_Figure_3.jpeg)

### Who are FRASS Users?

![](_page_44_Picture_2.jpeg)

- Timber Investment Management Organizations
- Forest Industry
- Tribal Forestry
- Consulting Foresters
- Public Agency Land Managers (Federal, State, County, City, University)
- Forestland Appraisers
- Asset Valuation Analysts
- Non-Industrial Private Forestland Owners

### **For What Purpose?**

![](_page_45_Picture_2.jpeg)

- Financially optimal timber
   stand harvest date selection
- New road construction location and timing (network solutions)
- Asset valuation  $\rightarrow$  on demand
- Land appraisal value using Income Capitalization Approach techniques
- Comprehensive data access by authorized users
- FRASS IS A FORESTLAND
   RESOURCE MANAGEMENT
   APPARATUS

FOREST RESOURCE ANALYSIS SYSTEM SOFTWARE

## **FRASS Subscription – 2 types**

### 1. Full FRASS Market System:

- Everything you saw in the presentation,
- Plus more

#### **Option #1 includes all of Option #2**

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#### **Forest Econometrics Bulletin**

#### Volume 2014 Issue 1, Washington State: Puget Sound and Olympic Peninsula Log Inventories Grow in Anticipation of Consumer Demand

Delivered log prices have continued upward progression to higher price levels. The <u>Real</u> price climb for many sorts has been to nearly double prices since the trough of June 2009. Mild winter weather provided log buyers with ample opportunity to fill inventories in preparation for the opment projects. There is pent-up demand building for wood products across North America, but the flow of "new wood" into the endproduct markets will first exhaust current log inventories (which are high in the northwest), then rely on new timber harvest materials. It is the reliance on the

should be supporting about 160 million workers, but the Bureau of Labor Statisvics reports (March 2014) d- that approximately 135 million workers are gainfully employed in the US. This e employment level is 1 million off from last summer, despite conflicting governe ment statistics.

![](_page_46_Picture_12.jpeg)

March 2014

First Quarter 2014

2. FRASS RPA Market Projections

- Log Market Data Analysis
- Real Price Appreciation Forecast Tool projections
- Price forecasts and trends in a Subscription to the quarterly
   Forest Econometrics
   Bulletin

### Forest Resource Analysis System Software

http://Forest-Econometrics.com/ You Tube

http://FRASS.Forest-Econometrics.com/

FTP://Data.Resource-Analysis.com/ User: FRASS

# THE PUZZLE IS ASSEMBLED: FRASS

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Schlosser@Resource-Analysis.com D&D Larix, LLC © 2014 Western Forest Economist Meeting May 18-20, 2014 <u>Missoula, Mo</u>ntana

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![](_page_48_Picture_0.jpeg)

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YouTube Video Music: Pure Amadeus By Wolfgang Amadeus Mozart Performed by Paulina Niemi-Loseva

Sonata C-minor, K. 457 Allegro Adagio Molto Allegro Sonata C-major, K. 545 Rondo

You Tube Visit us on our YouTube channel FRASS: Forest Resource Analysis System Software