



Intertribal Timber Council

Forest Appraisals and Forest Inventory - Focusing on the Inputs That Matter Most

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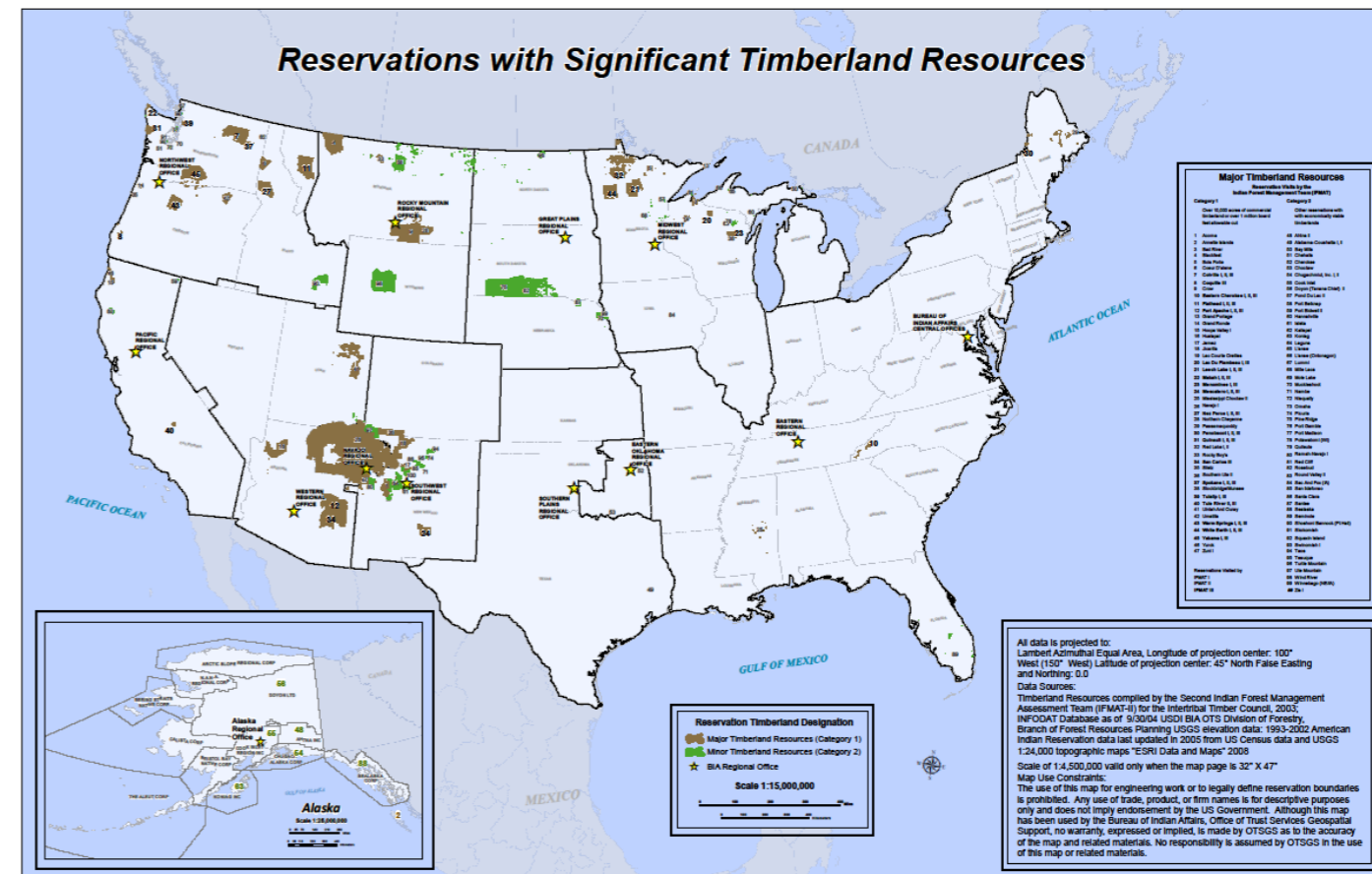


Tribal Forests are Both Natural, Community and Cultural Resources and Assets Providing Community, Economic, and Ecological Value to Tribes

- The approximately 18 million acres of tribal forests as timberlands and conservation assets are conservatively worth over \$27 billion

- Can Any Forest Owner Truly Manage Assets Without Knowing Their Value? The foundation of sustainable and responsible natural resource management is accountable timber, ecological, and community value creation over time

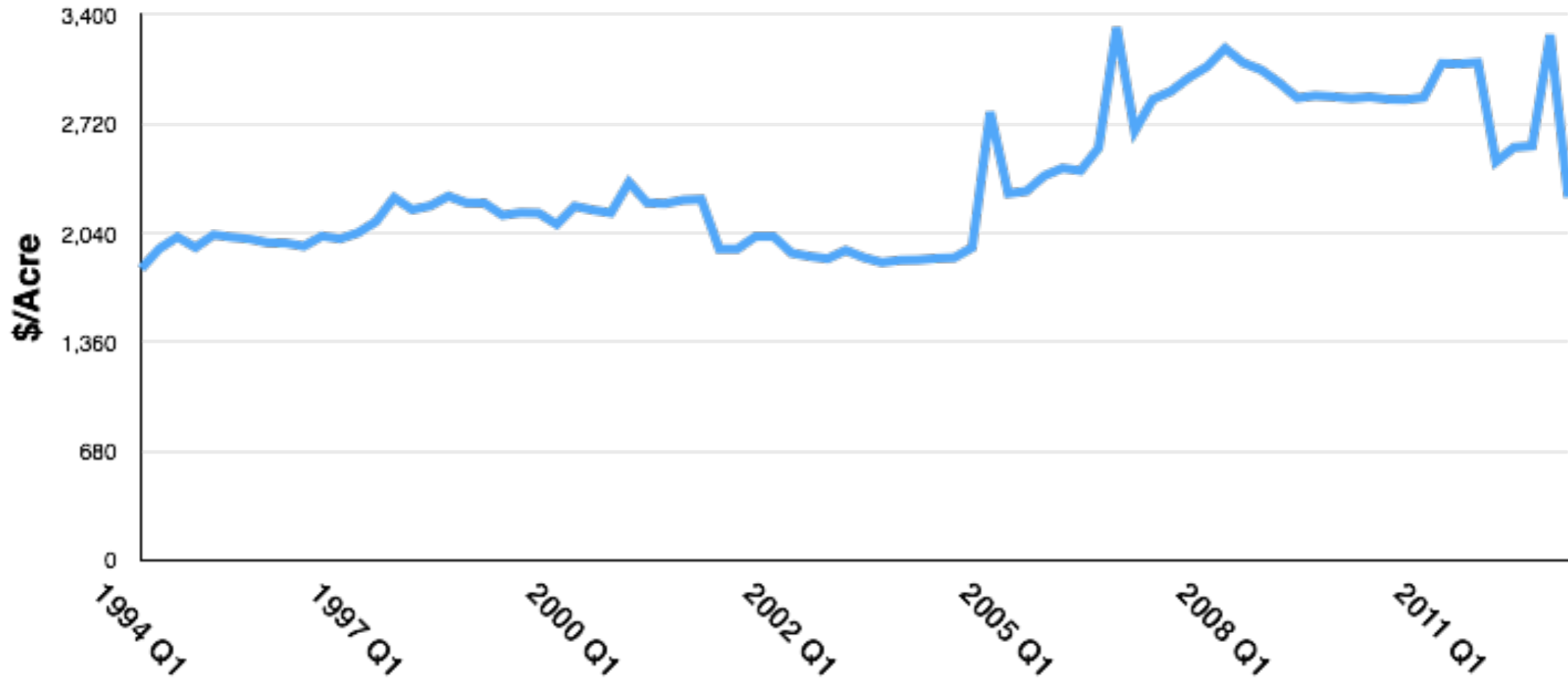
- Forest appraisal is about sustainably measuring the creation or diminishment of these values



Timber Valuation - Forest Information Systems Should “By Design” Provide Information Adequate to Meet Forestland Appraisal Requirements (USPAP)

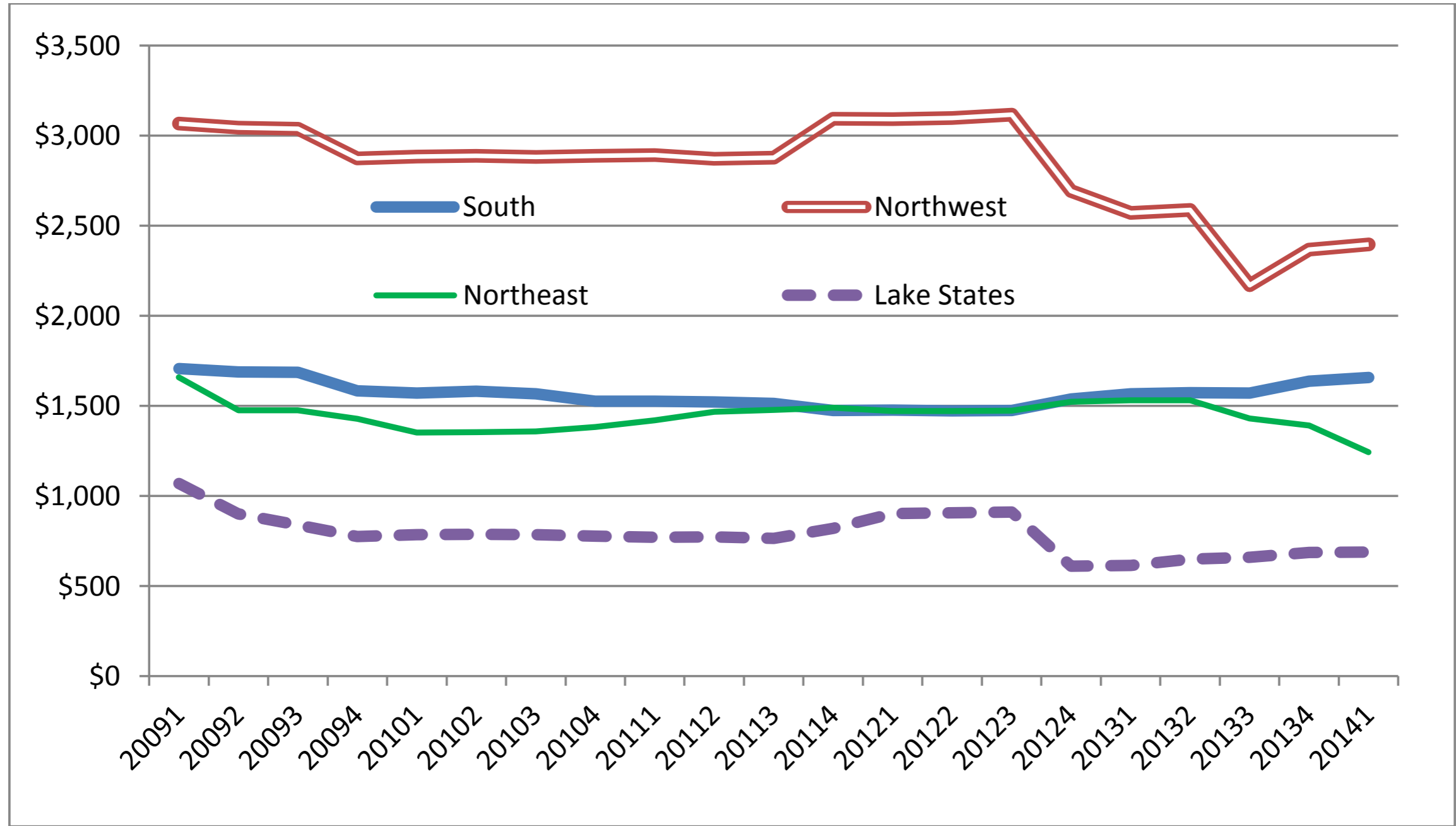
Estimating future timber yields, log prices and forest management costs are both *manageable and unmanageable uncertainties*. The most “value” impactful inputs for any forest appraisals are yield forecasting of the volume per acre by log grades & sizes, market delivered log prices, future forest management cost, working timberlands acres over time and discount (capitalization) rates.

NCREIF Western US Timberlands Values



South and Lake States Values Continue to Rebound From Recession

Value per Acre



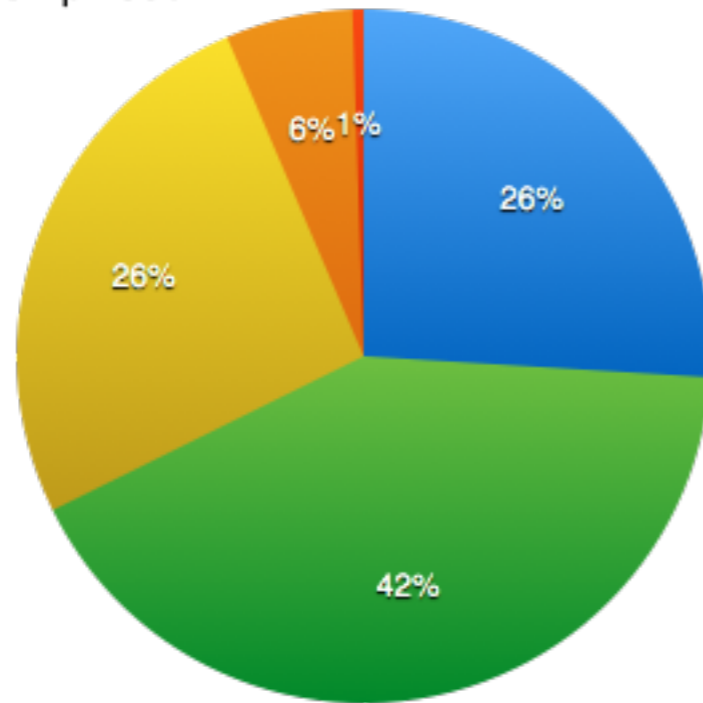
Source NCREIF 2014

Historically Most US Large Landowners Including Many Tribal Timber Inventories Programs Have Been Designed to Achieve Acceptable Standard Errors and Confidence Limits of Total Merchantable Volumes Per Acre - Case Example from White Mountain Apache Timber Sale Area

TC PSTATS				<u>PROJECT STATISTICS</u>				PAGE	2
				PROJECT	LONEPINE			DATE	2/1/2011
TWP	RGE	SC	TRACT	TYPE	ACRES	PLOTS	TREES	CuFt	BdFt
LP	LP	02	LEAVE	LS	15,717.00	330	849	S	E
CL	68.1	COEFF		NET CUFT FT/ACRE			# OF PLOTS REQ.	INF. POP.	
SD:	1.0	VAR.%	S.E.%	LOW	AVG	HIGH	5	10	15
BLACKPS		94.9	5.2	949	1,001	1,053			
YELLOWPS		315.5	17.4	107	129	151			
DOUGFIRS		444.6	24.5	61	81	100			
WFIRS		723.8	39.8	20	33	46			
TOTAL		81.7	4.5	1,188	1,244	1,299	266	67	30

However Standard Error Percentages on large and medium Ponderosa Pine Sawlogs historically have not been calculated and in this case of the Lone Pine Timber Sale are >80%.

● P. Pine 16"+ ● P. Pine 12-15" ● P. Pine 6-11" ● D. Fir #3
● Chipwood



2013 Stumpage
Values Per Acre

Yet these log grades & log sizes make up >66% of the current or NPV value of the timber sale unit

Cruising for Log Grade/Size Groups and Acquiring Sound Delivered Price Information is Essential to Reducing Uncertainty

Forest2Market Benchmark Data											
Domestic Softwood Log Delivered Prices											
Area	Product	Year-Qtr									
		<u>2010Q1</u>	<u>2010Q2</u>	<u>2010Q3</u>	<u>2010Q4</u>	<u>2011Q1</u>	<u>2011Q2</u>	<u>2011Q3</u>	<u>2011Q4</u>	<u>2012Q1</u>	<u>2012Q2</u>
<i>\$/MBF, Long Log Scribner Scale</i>											
2	Doug Fir-2s	456	518	485	463	573	594	556	567	526	541
	Doug Fir 3s (6-11") & 4s Combo	444	511	461	440	546	581	546	556	527	542
	Hem-Fir-2s	366	411	406	399	480	512	491	489	467	477
	Hem-Fir 3s (6-11") & 4s Combo	369	429	404	392	483	521	504	497	477	486
3	Doug Fir-2s	449	515	468	471	561	562	532	556	554	562
	Doug Fir 3s (6-11") & 4s Combo	454	522	462	449	563	559	511	527	526	554
	Hem-Fir-2s	383	438	409	418	493	507	470	457	461	480
	Hem-Fir 3s (6-11") & 4s Combo	390	451	408	414	495	502	483	460	464	482
<i>\$/MBF, ShortLog Scribner Scale</i>											
5	Hem-Fir-CR (6"+)	245	266	300	309	337	357	363	362	359	373
	Incense Cedar-CR	522	487	595	585	672	689	643	516	517	500
	Ponderosa Pine (6-11")	278	342	396	336	369	330	310	370	268	275
	Ponderosa Pine (12-15")	354	345	393	342	378	353	338	371	377	385
	Ponderosa Pine (16"+)	389	366	405	366	409	379	425	380	384	414
6	Doug Fir/Western Larch-CR (6"+)	320	367	332	333	348	355	361	366	363	382
	Engleman Spruce-CR (6"+)	272	329	298	305	334	354	340	332	333	372
	Hem-Fir-CR (6"+)	294	348	312	316	336	355	335	338	336	369
	Lodgepole Pine (6"+)	277	330	316	318	335	345	349	345	339	346
	Ponderosa Pine (6-11")		294	278	282	277	294	290	275	274	342
	Ponderosa Pine (12-15")	352	369	342	327	365	385	393	373	394	380
	Ponderosa Pine (16"+)		377	387	384	369	388	399	420	408	400

Central Oregon Delivered Log Prices

		<u>2010Q1</u>	<u>2010Q2</u>	<u>2010Q3</u>	<u>2010Q4</u>	<u>2011Q1</u>	<u>2011Q2</u>	<u>2011Q3</u>	<u>2011Q4</u>	<u>2012Q1</u>	<u>2012Q2</u>
Ponderosa Pine 5"-11"											
	F2M - A5	278	342	396	336	369	330	310	370	268	275
	F2M - A6		294	278	282	277	294	290	275	274	342
	OLMR - E	225	253	258	268	281	277	284	291	287	289
	Average	251	296	311	295	309	300	295	312	276	302
	Minimum	225	253	258	268	277	277	284	275	268	275
	Maximum	278	342	396	336	369	330	310	370	287	342
Ponderosa Pine 12"-17"											
	F2M - A5	354	345	393	342	378	353	338	371	377	385
	F2M - A6	352	369	342	327	365	385	393	373	394	380
	OLMR - E	314	330	332	268	347	366	363	361	349	352
	Average	340	348	356	312	363	368	364	368	374	372
	Minimum	314	330	332	268	347	353	338	361	349	352
	Maximum	354	369	393	342	378	385	393	373	394	385
Ponderosa Pine 18"+											
	F2M - A5	389	366	405	366	409	379	425	380	384	414
	F2M - A6		377	387	384	369	388	399	420	408	400
	OLMR - E	384	395	398	361	388	410	405	404	403	403
	Average	387	379	397	370	389	392	410	401	398	406
	Minimum	384	366	387	361	369	379	399	380	384	400
	Maximum	389	395	405	384	409	410	425	420	408	414

Re-Architecting Forest Inventories = Sampling to Achieve a Current Stumpage Value per Acre of Plus Or Minus Ten Percent Standard Error

- New Stand Level field cruises incorporating double sampling or sampling proportional to tree size can achieve such inventory and appraisal standard error targets.
- There are several well established international cruising systems built to incorporate both flexibility in log grade/size analysis at a stand level (Plotsafe & YTG N)

So Why Invest in Reducing the Manageable Uncertainties of Timber Appraisals?

- At current average Western forest values reducing 1% of uncertainty of log grade yields or log prices improves appraisal reliability by \$27-\$30 per acre.
- Stand level forest inventory cruising designed for value versus volume can easily improve Western US appraisal reliability by \$200-\$400 per acre and during periods of high comparable timberlands sale prices insure net cash return on asset expectations (ROA) are achieved.