AMERICAN FOREST RESOURCE COUNCIL

March 9th, 2017

Via email to sepacenter@dnr.wa.gov and first class mail

Washington Department of Natural Resources (DNR)
SEPA Center
P.O. Box 47015
Olympia, WA 99504-70115

Re: Comments on the Draft Environmental Impact Statement ("DEIS") for Alternatives for Establishment of a Sustainable Harvest Level
File no. 15-012901

To Whom It May Concern:

Please accept these comments on behalf of the American Forest Resource Council ("AFRC") and its members on the Draft Environmental Impact Statement on Alternatives for Establishment of a Sustainable Harvest Level for Forested State Trust Lands in Western Washington (the DEIS).

We appreciate the Department of Natural Resources (DNR) has invested substantial time and effort to produce this document. Unfortunately, the violation of the trust responsibilities, failure to consider reasonable alternatives, lack of reliable inventory, and failure to realistically address arrearage reveal a fatally and legally flawed planning process. At a minimum, AFRC encourages DNR to prepare a new DEIS with adequate alternatives that complies with the law.

AFRC's interests. AFRC is a regional trade association whose purpose is to advocate for sustained yield timber harvest on public timberlands throughout the West to enhance forest health and resistance to fire, insects, and disease.

AFRC's members own and operate the mills that are a primary market for the logs DNR sells from state trust lands. AFRC members have relied on the availability of sustainable raw materials from the state trust lands to invest hundreds of millions of dollars in the forest products mills that they own and operate in Washington State. They employ thousands of workers, paying family wages. In most cases, AFRC member mills are located in small rural communities in which there are often few, if any, alternative employment opportunities. In addition to the direct employment at AFRC member mills, the harvest of the timber to supply those mills creates jobs for loggers, contractors who subsequently reforest the land, and those involved in transporting raw materials from the forest to the mill. The mills of AFRC members are the economic lifeblood of the communities in which they are located.

The ability to operate a forest products mill depends on having a stable and adequate supply of timber within a reasonable haul distance from the mill. It is imperatives that DNR timber sales be economically and operationally viable. Although some AFRC members own forestland that provides a portion of their raw material supply, all AFRC members depend on the ability to buy timber on the open market. A stable supply of logs from public forestlands is particularly important because unprocessed logs from

public lands cannot be exported. By contrast, because unprocessed logs can be exported from private lands, our members must compete for private log supply with foreign mills. Timber harvests from public lands is an important guarantor of volume for domestic mills and of employment in rural communities. Over the last decade, harvests from state trust lands have been as much as 29 percent of the total harvest from westside forests. http://www.dnr.wa.gov/TimberHarvestReports.

Thus, an accurate sustainable harvest calculation is essential to AFRC members. They do not seek a sustainable harvest calculation that is higher than the land base can support; that would lead them to overinvest in mill infrastructure. But they also seek a sustainable harvest calculation that does not understate the capacity of the state trust land to produce sustained, economically viable harvests. In fact, the lack of an adequate mill supply has been the driving force in the closure of independent mills in Washington and dramatic reduction in domestic forest products manufacturing base in other Western states over the last decade. Having invested hundreds of millions of dollars in their mills, AFRC members depend on land managers, and particularly the managers of state trust lands, to harvest as much timber as the land can support while also complying with state and federal laws and adopted DNR policy.

The relationship of DNR's trust lands with AFRC member mills is symbiotic. DNR manages the lands in trust for income beneficiaries, and is obligated to manage them with undivided loyalty to those beneficiaries. In parts of the West, restrictions on harvest from public lands have grown to the point at which essentially all mills within reasonable haul distance of public forests have been forced to close. The result has been that forest managers have no market for logs that could be harvested from public lands, making effective management of those lands impossible. While Washington is not at that point, the ability of DNR to sell its timber into a competitive market depends on there being multiple mills interested in buying its wood. Thus, DNR will fail in its obligations to its trust beneficiaries if it understates the productive capacity of its lands (which is based on the sustainable harvest calculation), thereby forcing mills to close and restricting future competition and reducing competitive prices for its wood.

Based on these interests, AFRC has significant concerns about the DEIS. After extensive review, we have concluded the DEIS does not fulfill DNR's legal obligations under the State Environmental Policy Act (SEPA) or its statutory obligation to the calculation of an accurate sustainable harvest level (SHC) for the next decade. These are grouped under the following headings:

I. **Inconsistencies/Insufficient Documentation:** AFRC has identified numerous flaws and inconsistencies in information and documentation displayed in the DEIS and between the DEIS and DNR's 2004 Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington (2004 SHC FEIS) which must be rectified.

II. **Inventory Data and Modeling Methodology:** AFRC believes the methodology and processes for the development of a sustainable harvest calculation target for the planning decade fiscal years 2015-2024 (FY15--FY24) is fundamentally flawed. Due to these flaws, there is no reasonable basis to determine the sustainable harvest level for the planning decade FY15--FY24.

III. **Legal issues:** AFRC notes that a number of legal issues must be addressed before the DEIS meets trust law and statutory requirements.

For ease of reference in responding to our comments, we have numbered the issues addressed sequentially throughout this document.

I. **Inconsistencies/Insufficient Documentation:**

In our review of the DEIS for the FY15--FY24 planning decade, we found a variety of inconsistencies and insufficient information for the public and decision makers to fully understand this process and to make informed decisions. These issues are located both within the current DEIS and between the current DEIS and other DNR documents, such as the 2004 SHC Final Environmental Impact Statement (FEIS). As part of our review we took a historical view of the planning process (something important to consider in long-term natural resource management) by looking back at what was expected from the 2004 SHC planning process and the information provided in the 2004 SHC FEIS.

We will cover our concerns by issue:

Issue 1: *Insufficient data - forested versus non-forested acres.* Table 2.3.1 (DEIS, p. 2-8) identifies 1,567,020 acres of DNR managed lands. Yet Table 1.3.4 lists 1,465,000 acres of DNR managed forested land in the analysis area. This is a variance of 102,020 acres, or nearly twice the land area of the City of Seattle, implied to be in a non-forested state.

Table 2.3.1. Land Ownership in Western Washington (Forested and Non-Forested)

Land within Western Washington		Acres
Total land regardless of ownership		19,465,123
	Acres	Percent
US Forest Service, USFWS, and National Park Service land	5,647,041	29%
DNR-managed land	1,567,020	8%
Private and other	12,251,062	63%

Table 1.3.4. DNR-Managed Lands in the Analysis Area

Category	Forested acres	Percent
All sustainable harvest units	1,379,000	94%
Other lands (including natural areas)	87,000	6%
Total	1,465,000	100%

It is important for the reviewer and the decision maker to fully understand the differences between forested and non-forested acres and to have accurate data for each. DNR needs to provide further details as to the nature, location, and distribution of any truly non-forested acres.

Issue 2: *Inconsistency in documentation for acres managed for Forest Cover*.[1] Table 1.3.2 (DEIS, p. 1-8) lists the acres managed for Forest Cover by Alternative; however, Table 4.2.5 (DEIS, p. 4-13) lists a different number of acres managed for Forest Cover by Alternative. As seen in the tables reproduced below, there is a variance between tables of 2,000 acres on the low end to 25,000 acres on the upper end.

Table 1.3.2. Distribution of Lands by Management Category
(Refer to Chapter 2 for a detailed description of the alternatives)

	Lands managed for forest cover (acres)	Lands where harvest may occur (acres)	Total (acres)
Alternative 1	708,000	758,000	1,466,000
Alternative 2	700,000	766,000	1,466,000
Alternative 3	731,000	735,000	1,466,000
Alternative 4	732,000	734,000	1,466,000
Alternative 5	816,000	650,000	1,466,000

Table 4.2.5. The Total Number of Acres Under Each Alternative Managed for Forest Cover

Alternative	Acres	Difference from Alternative 1	Difference from Alternative 1 as a percent of acres in the analysis area
Alternative 1	726,000	-	-
Alternative 2	716,000	10,000	0.7%
Alternative 3	733,000	-7,000	-0.5%
Alternative 4	740,000	-14,000	-1.0%
Alternative 5	791,000	-65,000	-4.4%

Differences of anywhere from 2,000 acres (Alt 3) to 25,000 acres (Alt 5) between tables are clearly more than a rounding error or typo. There is not adequate information or detail provided for the reviewer to understand the variances. For the benefit of the reviewing public and the decision makers, AFRC requests clarification, identification, and explanation for the variance identified.

Issue 3: *Insufficient data presented – Acres deferred from management*. Table 1.3.2 DEIS, p. 1-8), reproduced above, identifies the acres managed for forest cover and the acres "where harvest may occur." This table would imply the "Lands managed for forest cover" column identifies the number of acres deferred from management for what AFRC assumes is the 10-decade (100 years / Long Term Deferral)[2] planning period of the

[1] The DEIS defines lands "managed for forest cover" as forest lands that are "managed for wildlife habitat or other ecological values and include Natural Area Preserves, Natural Resource Conservation Areas, riparian areas, lands in stream and wetland buffers, areas managed for northern spotted owl or marbled murrelet habitat, certain potentially unstable slopes, and areas with a range of operational difficulties." DEIS at 1-7.

[2] See planning period discussion under Issue 7. 100 years versus 50 years

DEIS. However, in various presentations regarding the SHC and Marbled Murrelet Long-Term Conservation Strategy (MMLTCS) made to the public and the Board of Natural Resources, the Department implied portions of the "Lands managed for forest cover" would see some level of active management. It is unclear to the reader, and ultimately the decision maker, what the total number of acres deferred from management for the long-term are and what portion of the forest cover acres are managed. AFRC was unable to locate more detailed explanations and identification of the acres available for management in the forest cover category and the acres deferred from management. The difficulty in identifying long-term deferrals is further complicated by the figures presented in the Fiscal Year 2008 and Fiscal Year 2015 (FY15) Annual Reports.

Deferrals | FY 2015 FORMERLY KNOWN AS ACRES OFF-BASE FOR HARVEST

Trust / Beneficiaries	No Deferral Acres	Short-Term Def. Acres	Long-Term Def. Acres
STATE FOREST TRANSFER			
Clallam	63,965	269	24,499
Clark	22,342	639	2,160
Cowlitz	9,797	18	570
Grays-Harbor	1,738	0	477
Jefferson	12,136	56	1,668
King	16,137	0	5,394
Kitsap	6,308	0	835
Klickitat	18,568	0	264
Lewis	31,130	0	7,138
Mason	23,081	0	3,589
Okanogan	9	0	0
Pacific	8,734	0	5,782
Pierce	7,759	0	759
Skagit	55,247	449	24,360
Skamania	24,556	71	12,169
Snohomish	47,702	43	11,871
Stevens	124	0	7
Thurston	15,195	0	3,660
Wahkiakum	8,495	32	3,834
Whatcom	20,082	0	8,065
Subtotal Transfer	**393,104**	**1,576**	**117,102**

Trust / Beneficiaries	No Deferral Acres	Short-Term Def. Acres	Long-Term Def. Acres
STATE FOREST PURCHASE			
Clallam	138	0	92
Clark	2,420	0	1,260
Cowlitz	219	9	37
Grays-Harbor	23,548	0	4,159
Jefferson	12	0	4
Kitsap	39	0	36
Klickitat	40	0	0
Lewis	2,608	0	334
Mason	403	0	104
Pacific	4,931	30	2,824
Pierce	2,812	0	432
Skagit	741	0	32
Skamania	2,798	0	1,537
Snohomish	1,600	0	39
Stevens	35	0	4
Thurston	18,762	0	3,695
Whatcom	710	0	243
Subtotal Purchase	61,815	38	14,834

Trust / Beneficiaries	No Deferral Acres	Short-Term Def. Acres	Long-Term Def. Acres
Comm. School, Indenmity & Esch.	862,288	1,851	219,218
Capitol Grant	72,624	464	26,088
Scientific School	53,625	329	11,788
Normal School	43,832	0	11,289
University, Original & Transferred	43,956	264	13,039
Agricultural School	42,368	100	10,970
CEP&RI	34,100	5	5,608
Water Pollution Control Division Trust Land	5,049	0	504
Community College Forest Reserve	3,322	0	54
Community Forest Trust	0	0	44,923
Other Lands*	2,796	0	119,331
Total – All TRUSTS	**1,618,878**	**4,627**	**594,747**

About This Page

These data are in the 2015 Annual Report to Trust Beneficiaries, per RCW 79.10.010.

With the adoption of the 2004 Sustainable Harvest Level, DNR no longer classifies lands as "off-base" or "on-base," but instead designates deferral status.

Long-term deferral approximates "off-base."

Deferral status is determined by whether the silviculture and land management activities, including harvest, are permitted or deferred for a period of time. Short-term deferrals represent forestlands anticipated to be deferred from harvest in the next 10 years. Long-term deferrals represent forestlands anticipated to be deferred from harvest beyond 10 years and forestlands managed for non-timber harvest revenue objectives.

Acres are designated as deferrals because they are inoperable, are low site, contain permanent research plots, are upland wildlife management areas, are timber gene pool reserves, are on unstable slopes in riparian buffers, are located in a northern spotted owl nest patch, contain a northern spotted owl site center, are identified as marbled murrelet habitat, are included in the Olympic Experimental State Forest deferral areas, or are the result of the Settlement Agreement reached in 2006, or the 2006 Policy for Sustainable Forests Old-Growth Policy (all of these decisions were included in the 2007 sustainable harvest adjustment for Western Washington State Trust forestlands). A site can be deferred due to one or more factors.

Deferral classifications are not permanent designations. DNR may change the classification as specific forest stands or sites are re-evaluated. Acreage updates and changes can occur over time due to technological refinements in data gathering and analysis.

Numbers may not add due to rounding or potential double counting.

* Includes Land Bank, Natural Resources Conservation Areas, Natural Area Preserves, administrative sites, TIDE-2nd, UC-Private, and Water Pollution Control trust data.

Source: Deferral Status of State Forestlands DNR Forest Resources Division, LDO v20150928, 2015.

The table from the DNR 2015 Annual Report lists a total of 726,683 acres in long-term deferral classification. This number is very close to the acres listed in DEIS Table 4.2.5 for acres managed for forest cover under Alternative 1. There are still unexplained issues

with these figures, which will present the decision maker with the inability to fully understand the variances. These issues include the high potential for acres listed in the FY15 report to be outside of the planning area covered by this DEIS and the potential for "double counting" as explained in the FY15 Annual Report "about this page" disclaimer that "*acres may not add due to rounding or potential double counting."* It is unclear how there could be potential double counting of deferral acres. Additionally, it is unclear how DEIS Table 1.3.2 compares to the No Action alternative and the 2015 Annual Report, i.e., 708,000 versus 726,683 acres.

Further concern comes from the comparison of the deferral acres listed in this DEIS and the 2015 Annual Report when compared with those in the DNR 2008 Annual Report. There was roughly double (354,849 acres in 2008 vs. 726,683 in 2015) the long-term deferral acres in 2015 than in the DNR 2008 Annual Report, yet DNR reports no changes in management policies and none have been adopted by the Board of Natural Resources as part of the current SHC process.[3] Further disclosure of this information is critical for the reviewing public to comment on and the decision maker to make a fully informed decision about the impacts addressed in this DEIS. This significant change in deferral acres, from the mid-point of the previous planning decade to the first fiscal year of the current planning period, needs to be understood by the public and decision makers. Discrepancies in acres is at the heart of the available land base for growing and harvesting timber as well as meeting Habitat Conservation Plan requirements.

[3] Long term deferrals of State Forest Transfer Lands went from 81,705 acres in FY 2008 to 117,102 acres in 2015 (a 43% increase). Long term deferrals of State Forest Purchase Lands went from 9,411 acres in FY 2008 to 14,834 in FY 2015 (a 58% increase). Long term deferrals of all other trusts went from 263,733 acres in FY 2008 to 462,811acres in FY 2015 (a 75% increase).

Deferrals

Formerly known as Acres Off-Base for Harvest

July 1, 2007 – June 30, 2008

- With the adoption of the 2004 Sustainable Harvest Level, DNR no longer classifies lands as "off-base" or "on-base," but instead designates deferral status. Long-term deferral approximates "off-base."
- 2008 Annual report to Trust Beneficiaries per RCW 79.10.010

'08

Trust / Beneficiaries	No Deferral Acres	Short-Term Deferral Acres	Long-Term Deferral Acres
State Forest Transfer (formerly known as Forest Board Transfer lands)			
Clallam	70,073	0	16,561
Clark	23,539	0	1,135
Cowlitz	9,898	0	394
Grays Harbor	1,841	0	323
Jefferson	12,688	0	375
King	16,837	542	4,995
Kitsap	6,764	0	584
Klickitat	16,613	0	2,703
Lewis	36,324	0	1,553
Mason	23,592	389	2,333
Okanogan	9	0	0
Pacific	10,826	72	3,512
Pierce	7,807	0	563
Skagit	59,754	0	16,968
Skamania	28,358	0	7,730
Snohomish	50,905	82	7,171
Stevens	120	0	7
Thurston	17,575	0	1,255
Wahkiakum	8,651	0	3,654
Whatcom	25,206	0	9,888
Subtotal - Transfer	427,379	1,085	81,705
State Forest Purchase (formerly known as Forest Board Purchase lands)			
Clallam	182	0	49
Clark	2,332	0	1,310
Cowlitz	246	0	20
Grays Harbor	23,943	0	2,974
Jefferson	18	0	0
Kitsap	76	0	0
Klickitat	36	0	0
Lewis	2,839	0	47
Mason	395	0	101
Pacific	6,168	162	1,464
Pierce	3,137	0	64
Skamania	3,141	0	1,109
Snohomish	1,557	0	5
Stevens	40	0	0
Thurston	19,642	0	1,995
Whatcom	649	0	274
Subtotal - Purchase	64,400	162	9,411
Common School, Indemnity & Escheat	849,268	2,087	129,376
Agricultural School	48,574	0	3,702
University – Original & Transferred	43,756	1,007	9,910
CEP&RI	34,916	62	4,116
Capitol Building	78,750	763	17,362
Normal School	42,935	19	8,690
Scientific School	54,604	150	8,084
Community & Technical College	3,061	0	61
Other Lands*	524	0	82,432
Forest Reserve			
TOTAL – ALL TRUSTS	**1,648,167**	**5,336**	**354,849**

Notes

- Deferral status is determined by whether the silviculture and land management activities, including harvest, are permitted or deferred for a period of time. *Short-term deferrals* represent forestlands anticipated to be deferred from harvest between 2004 and 2013. *Long-term deferrals* represent forestlands anticipated to be deferred from harvest beyond 2013 and forestlands managed for non-timber harvest revenue objectives.
- Acres are designated as deferrals because they are inoperable, are low site, contain permanent research plots, are upland wildlife management areas, are timber gene pool reserves, are on unstable slopes, in riparian buffers, are located in a northern spotted owl nest patch, contain a northern spotted owl site center, are identified as marbled murrelet habitat, are included in the Olympic Experimental State Forest deferral areas, or are the result of the Settlement Agreement reached in 2006, the 2006 Riparian Restoration Strategy or the 2006 Policy for Sustainable Forests Old-Growth Policy (all of these decisions were included in the 2007 sustainable harvest adjustment for western Washington State Trust forestlands). A site can be deferred due to one or more factors.
- Deferral classifications are not permanent designations. DNR may change the classification as specific forest stands or sites are re-evaluated. Acreage updates and changes can occur over time due to technological refinements in data gathering and analysis.
- Numbers may not add due to rounding or potential double counting.

* Includes Land Bank, Natural Resources Conservation Areas, Natural Area Preserves, administrative sites, TIDE-2nd, UC-Private, and Water Pollution Control trust data.

Sources

- Deferral Status of State Forestlands, DNR Land Management Division 2008

AFRC requests further disclosure of the geographic distribution of acres indefinitely deferred from management (sometimes referred to as "off-base"). AFRC, and the reviewing public, would also benefit from knowing what acres are deferred solely for the 100-year planning time frame and those available for management within both the 100-year planning period and the 10-year term (FY15—FY24) of the current calculation.

Additionally, the DEIS must include a discussion and explanation for the roughly doubling of Long Term Deferral acres between FY08 and FY15 without changes in policy.

Issue 4: *Historical review for consistency*. The DEIS references on page 5-1 the *Final Environmental Impact Statement [FEIS] on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington* (DNR 2004) (2004 SHC FEIS). We have compared the 2004 SHC FEIS with the current DEIS to determine consistency over time. We have identified a number of unexplained variances between the two documents which require explanation:

Variance #1: *Inconsistency/Variation of forested/total acres.* DNR reports in the current DEIS forested acres within sustainable harvest units as 1,379,000 acres and total forested acres as 1,465,000 per Table 1.3.4 (DEIS p. 1-10).

Table 1.3.4. DNR-Managed Lands in the Analysis Area

Category	Forested acres	Percent
All sustainable harvest units	1,379,000	94%
Other lands (including natural areas)	87,000	6%
Total	1,465,000	100%

However, this is not consistent with the 2004 SHC FEIS Table 2.6-4. According to the 2004 SHC table (reproduced below), there are 1,390,700 forested acres.

2004 SHC FEIS Table 4.11-1, reproduced below, shows 1,446,733 total westside acres, with 1,337,035 forested acres. However, in Table B.2.6-2 (2004 FEIS), reproduced below, by summing all columns there are 1,390,000 acres of forested land identified. The acre variances are summarized below and need further explanation.

Table 2.6-4. Summary of Off- and On-Base Lands

				On-Base					
Year	Alternative	Off-Base		Riparian and Wetland Area		Uplands with Specific Objectives		Uplands with General Objectives	
		Acres	%	Acres	%	Acres	%	Acres	%
2004	Alt.1	763,000	55%		0%	322,500	23%	305,200	22%
	Alt.2	489,300	35%	214,800	15%	343,100	25%	343,500	25%
	Alt.3	514,400	37%	238,600	17%	328,100	24%	309,600	22%
	Alt.4	755,500	54%		0%	326,400	23%	308,800	22%
	Alt.5	513,400	37%	238,700	17%	329,600	24%	309,000	22%
	PA	515,500	37%	237,800	17%	327,800	24%	309,600	22%
2013	Alt.1	736,600	53%		0%	348,400	25%	305,700	22%
	Alt.2	281,100	20%	278,100	20%	477,200	34%	354,200	25%
	Alt.3	213,000	15%	346,200	25%	477,200	34%	354,200	25%
	Alt.4	573,400	41%		0%	463,500	33%	353,800	25%
	Alt.5	213,000	15%	346,200	25%	477,200	34%	354,200	25%
	PA	232,100	17%	329,000	24%	475,400	34%	354,200	25%

Notes:
Off-base acres include both long-term (multiple decade) timber harvest deferrals (such as northern spotted owl nest patches, Natural Area Preserves) and short-term deferrals (such as some transition lands, northern spotted owl circles in some Alternatives).
PA = Preferred Alternative

Table 4.11-1. Trust Lands Managed by DNR, by Trust Beneficiary

	Total Acres[1/]	Total Forested Acres[1/]	Westside Acres[2/3/]	Westside Forested Acres[4/]
Federal Grant Trust Lands				
Agricultural School Grant (Washington State University)	70,733	56,783	27,579	26,210
Capitol Building Grant	108,281	100,290	91,715	85,460
Charitable, Educational, Penal, and Reformatory Institutions Grant	70,278	40,141	29,289	26,810
Common School, Indemnity, and Escheat Grants	1,746,020	1,103,452	560,377	508,307
Normal School Grant (Eastern Washington University, Central Washington University, Western Washington University, and The Evergreen State College)	64,304	57,005	34,757	32,549
Scientific School Grant (Washington State University)	80,455	68,549	56,268	52,995
University Grants (University of Washington) Original and Transferred	86,806	56,954	43,723	41,130
Federal Grant Trust Land Total	**2,226,877**	**1,483,174**	**843,708**	**773,461**
State Forest Lands				
Purchase and Transfer	625,178	595,241	603,025	563,604
Community College Forest Reserve[5/]				
Community College Forest Reserve Lands	3,339	3,339	3,339	3,079
Total for all Trust Lands	**2,852,055**	**2,078,415**	**1,446,733**	**1,337,065**

Data Sources:
[1/] DNR 2001 (various tables).
[2/] DNR Geographic Information System data 2003.
[3/] DNR Geographic Information System data identifies 79,672 acres in 9 other categories: Administrative Site, Tidelands - 2nd Class, Land Bank, CEP&RI Transferred, Under Contract to Private Party, Natural Area Preserve, Natural Resources Conservation Area, Non-specific Non-fiduciary Trust, and Water Pollution Control Division Trust Land.
[4/] These data compiled from the OPTIONS model identify 50,558 acres in the 9 other categories identified in footnote 3.
[5/] Lands managed per Revised Code of Washington (RCW) 79.02.420, which specifies the management of, and disposition of revenues from, these lands.
Note: Numbers rounded; when added may not equal total.

Table B.2.6-2. Acres of Land Deferred from Timber Harvest and Acres by Land Classification for Each Alternative

		Acres Deferred from Timber Harvest		Land Classification		
Year	Alts.	Long-term Deferrals	Short-term Deferrals	Riparian and Wetlands	Uplands with Specific Objectives	Uplands with General Objectives
2004	1	486,000	40,000	237,000[1/]	323,000	305,000
	2	281,000	208,000	215,000	343,000	343,000
	3	213,000	301,000	239,000	328,000	310,000
	4	238,000	280,000	238,000[1/]	326,000	309,000
	5	213,000	300,000	239,000	329,000	309,000
	PA	213,000	302,000	238,000	328,000	310,000
2013	1	486,000		251,000[1/]	348,000	306,000
	2	281,000		278,000	477,000	354,000
	3	213,000		346,000[1/]	477,000	354,000
	4	238,000		336,000	464,000	354,000
	5	213,000		346,000	477,000	354,000
	PA	232,000		329,000	475,000	354,000

Data Source: Model output data (State of the Forest)
[1] The majority of the area in riparian and wetlands in these Alternatives is effectively in long-term deferral.

The chart below shows the variances between the current DEIS Table 1.3.4 and the 2004 FEIS Tables.

Acres Comparison of Tables from 2004 FEIS and Current DEIS							
	2016 DEIS Tbl 1.3.4	2004 FEIS Tbl 2.6-4	Change from Tbl 1.3.4	2004 FEIS Tbl 4.11-1	Change from Tbl 1.3.4	2004 FEIS Tbl B.2.6-2	Change from Tbl 1.3.4
Forest Acres in SHU	1,379,000	1,390,700	**11,700**	1,337,035	**(41,965)**	1,390,000	**11,000**
Total Forested Acres	1,465,000	-	-	1,446,733	**(18,267)**	-	-

AFRC requests an explanation for the variances in acreage between these two documents. Since the 2004 FEIS was referenced as a source of information for the analysis of impacts from the current proposal, a clear understanding of the causes of these variances is needed for the reviewing public and the decision makers.

Variance #2: *Lack of information/variance in data regarding standing inventory.*
The 2004 FEIS reports in Table 4.2-3, reproduced below, a standing volume of 31 billion board feet (BBF). Further, DNR anticipated in 2004 SHC FEIS Table 4.2-7, reproduced below, the expected changes in standing volume by Alternative over the remaining life of the HCP.

As seen below, for the 2004 FEIS Preferred Alternative, this figure amounted to 32 BBF by 2013 and 45 BBF by 2067. It should be noted this was based on a much higher harvest level (636 BBF) than what was eventually adopted or produced in the FY'04-FY'14 planning decade. However, in 2014, DNR disclosed in the report "Assessment of Hardwood Growing Stock on Westside DNR Trust Lands" a standing inventory of 46 BBF. This is an unrealistic variance of standing volume and reveals poor rudimentary mathematics, or poor inventory and modeling quality. Unfortunately for the reviewing public and the decision maker, it appears DNR chose not to present standing volume numbers in the current DEIS. Thus, it is not possible to make an informed review of the differences between 2004 and 2016, despite DNR referencing the 2004 SHC FEIS for information on analyzing impacts of harvesting. DNR must provide the current standing inventory and an explanation for the extreme variances between the documents referenced above.

Table 4.2-3. Total Current Standing Timber Volume for Western Washington Forested State Trust Lands by Land Class

	Standing Volume	
Land Classification	**Billion Cubic Feet**	**Billion Board Feet (Scribner)**
Uplands with General Objectives	2	8
Uplands with Specific Objectives	3	13
Riparian	2	10
Total	**7**	**31**

Data Source: Model output data (stand development stages).

Table 4.2-7. Change in Standing Volume from Base Year 2004 by Alternative through 2067 (billion board feet)

Year Modeled	Alternative					
	1	2	3	4	5	PA
2004	31	31	31	31	31	31
2013	35	34	33	35	32	32
2031	46	41	38	45	34	37
2067	60	50	46	58	41	45

PA = Preferred Alternative
Source: Model output data (stand development stages).

Variance #3: *Inconsistency with acres reported versus transactions reported.*
Appendix C Table 1. "Factors considered by the subcommittee as contributing to arrearage" (DEIS pp. C8--9) references Land Transactions as a contributing factor to the arrearage volume. This table further identifies the disposal of 57,000 acres and the acquisition of 69,000 acres over the planning decade. AFRC is aware of the significant quantity of disposal acres; however, AFRC has not been able to locate information and details regarding the acquisition of 69,000 acres. AFRC has not been made aware of any large land purchases by DNR in the previous planning decade, especially under the Trust Land Transfer program.

Table 1 implies a net gain of 12,000 acres of trust lands. However, comparing 2004 SHC FEIS Table 2.6-4 with DEIS Table 1.3.4, there is a net loss of a minimum of 11,700 acres. AFRC requests an itemized list of transactions, including, at a minimum:

a. total acres disposed;
b. total acres acquired by transaction;
c. the mechanism/program authorizing the transaction (e.g. TLT, trade, outright purchase;)
d. trusts impacted; and
e. volume impacted.

It would also be helpful to understand how these transactions, particularly the difference in volume (and acres and value) disposed versus acquired, meets DNR's fiduciary obligations, especially as they relate to intergenerational equities and protecting the corpus of the trust. Without a clear understanding of these variances it is not possible for the decision maker to make a fully informed decision on the impacts of land acreage changes for both the arrearage issue and overall impacts to harvest numbers.

Issue 5. Other issues related to "Appendix C Table 1 Factors considered by the subcommittee as contributing to arrearage," DEIS at C-8 to C-9, requiring explanation and analysis for the reviewing public and decision makers.

1. Riparian Area: As stated by DNR, "*The modeling assumption was not validated and the assumption was never adjusted during the planning decade*." (DEIS C-9) Simply failing to meet a target does not directly correlate to the assumption the target was set too high or the modeling assumption was wrong. The public must understand why the riparian harvest was not done, how the failure to do so complies with the duty of a prudent trust manager, evidence the modeling assumption was incorrect beyond simply stating "the Department failed to meet the target," and how DNR plans to assure this type of error does not occur in the future. The fairly obscure words of the DEIS mask the fact that for the previous planning decade DNR has failed to conduct the riparian management that was an integral part of the previous sustainable harvest calculation. The result was less revenue for the trusts, less wood for AFRC member mills, and less improvement of riparian habitat called for by DNR's HCP. Now DNR appears to simply throw up its hands and declare that having failed its planned riparian management for the previous decade, it will not attempt riparian management going forward. Before it takes such a radical step to abandon management of trust assets, a detailed economic analysis of how the riparian thinning costs were developed, including evidence of increased layout and harvesting costs, is needed. The management of riparian areas has less to do with Net Present Value (NPV) and more to do with the ecological contract of the HCP to accelerate riparian stands towards desired future conditions.
2. Uncertainties:
    a. "*After the December 2007 wind storm (the Great Coastal Gale), the department focused resources on salvaging 1,100 acres as quickly as possible to maximize value. This effort redirected staff from working on normal deliverables.*" (DEIS at C-9) It is AFRC's understanding the salvage effort was considered additive at the time of the recovery process and all units were expected to maintain deliverables in addition to the salvage volume. Timber sale records also seem to indicate the fiscal year in which the salvage sales were brought forward was one of only two years that exceeded the 550 million board feet (MMBF)annual SHC

target. AFRC requests further explanation of how the December 2007 storm event contributed to the arrearage when sale data evidence seems to dispute that very argument.

b. *"The private sector curtailed harvest to a minimum, while the department continued harvesting to support local cash-strapped mills." (DEIS at C-9)* AFRC requests further explanation and documentation on how this would contribute to the arrearage. This is, in fact, counter to what would be expected with a curtailment from private timberlands. The reduction of materials available from private forestland would likely increase demand from DNR trust lands. What empirical data did DNR use to make this assessment?

c. *"The private sector exported logs overseas while the department continued to provide timber volume to local mills." (DEIS at C-9)* This statement requires more explanation and information to fully understand how a decrease in available logs from private lands would contribute to the decrease in logs coming available from DNR trust lands. AFRC requests more detailed analysis on how this allegedly contributed to growing the arrearage rather than decreasing it. What empirical data did DNR use to make this assessment?

Issue 6: *Differences in Stand Structure acres*. Stand development stage discussions do not use consistent acreages. On pages 3-24 of the DEIS, DNR states: *"Currently, approximately 82 percent (1,208,000 acres) of state trust lands within the analysis area are within the relatively low-value Competitive Exclusion stage, while approximately 11 percent are within the relatively high-valued Ecosystem Initiation (6 percent) and Structurally Complex (5 percent) stages."* This infers DNR based these percentages off a total land base of 1,473,171 acres (1,208,000/0.82). Using DNR's own numbers, the total acres in the Structurally Complex stage (5 percent) should be 73,658 acres. However, Table 4.2.6 (see below) identifies 70,000 acres as currently in a Structurally Complex state.

The figures are also inconsistent in Table 3.3.2. For example, the statement above identifies six percent of the acres in an Ecosystem Initiation stage. Using DNR's own numbers, there should be 88,390 acres (1,473,171 * 0.11) in the Ecosystem Initiation state. However, the table lists 95,000 acres in this stage. Even if the reader assumed a rounding error to the nearest 1,000 acres per Table

3.3.2, these variances are significant and require, at a minimum, an explanation. Over time, the "beginning point" for these development stages will dramatically impact harvest levels into the future.

Table 3.3.2. Stand Development Stages and Current Distribution of Acres of DNR-Managed Lands in Western Washington by Stand Development Stage (Rounded to nearest 1,000)

Stand development stage		Acres
Ecosystem Initiation Begins soon after most overstory trees have been removed by harvest or natural events. This stage is known to support a high number of wildlife species, particularly as foraging habitat.		95,000
Competitive Exclusion Trees fully occupy the site, competing for light, water, nutrients, and space. Dense overstory means there are few or no shrubs or groundcovers and relatively little wildlife use.		1,208,000
Understory Development Overstory trees die, fall down, or are harvested, creating gaps in the canopy. An understory of trees, ferns, and shrubs develops. This process can be accelerated through active management.		66,000
Biomass Accumulation Numerous large overstory trees rapidly grow larger in diameter, producing woody biomass. Forest stands lack large snags or downed woody debris in this stage.		26,000
Structurally Complex Approaching conditions of natural older forests with multiple tree and shrub canopy layers, dead and downed logs, and well-developed understory. Multiple tree canopies are present, supporting diverse vertebrate and invertebrate species.		70,000

Table 4.2.6. Acres of Structurally Complex Forest Under Each Alternative Currently and at the End of Decade 5

Alternative	Current conditions (acres)	Decade 5 (acres)	Decade 5 difference from Alternative 1 as a percent of acres in the analysis area (percent)
Alternative 1	70,000	168,000	
Alternative 2	70,000	160,000	-5%
Alternative 3	70,000	166,000	-1%
Alternative 4	70,000	170,000	1%
Alternative 5	70,000	178,000	6%

Further, these numbers are not consistent with the statement on pages 3-18 *"…DNR inventory information, there are approximately **88,000 acres of potential old growth** on DNR managed lands in Western Washington, with 60 percent of those acres demonstrating a high potential to be old growth (DNR 2005a)." (emphasis added)* What percentage of these 88,000 acres is in the Structurally Complex stage? Are the other development stages determined from the inventory? How did DNR calculate the percentages/acres for each development stage?

Finally, there is no information provided to identify the thresholds of each development class, which the Department is required to manage for under the 1997 HCP.

Issue 7: *Combinations for Alternatives.* On pages 2-5, DNR states there are 48 potential combinations of the various components of the Alternatives. DNR further states the combinations used to produce the five SHC Alternatives provides the greatest range. The DEIS does not discuss, or show how, the Alternatives selected provide the broadest range of potential outcomes. In fact, AFRC points out the potential number of combinations is 56 since the MM LTCS Alternative A could in theory be combined with the other arrearage and riparian alternatives. Thus, creating 7(MM LTCS) x 4(Arrearage) x 2(Riparian)= 56 potential combinations. AFRC requests the Department be more explicit in how it assured the maximum range of Alternatives was reached, including maximizing returns to the Beneficiaries, and maximizing volume available for sustained-yield timber harvests.

Issue 8: *Difference in analysis periods.* In reviewing the DEIS, it appears that harvest volumes by decade were calculated for a 10 decade, or 100-year planning period. However, most of the impacts (stand structure, carbon sequestration, etc.) were analyzed over a five decade or 50-year planning period. While we understand the five-decade period is intended to correspond to the remaining time period of the HCP, it is unclear how impacts in decades six to ten were analyzed or influenced harvest levels. Since stand structure, areas managed for forest cover, habitat thresholds, etc. were analyzed only for the first five decades, it is not possible for the reader or decision maker to fully understand the impacts on the environment or the ability of the Department to comply with its fiduciary obligation, particularly intergenerational equities from the harvest levels identified in decades one through ten.

Section I Summary: Inconsistencies/Insufficient Documentation:

The comments above point to much more than simple rounding errors and typos. They highlight a series of serious inconsistencies, insufficient data, and errors of the DEIS. These issues point to a fundamentally flawed analysis and lead to legitimate questions and concerns from AFRC and its members – the current and future purchasers of DNR timber – over the inventory quality and modeling efforts which are the basis for much of the data presented. It is clear that, in addition to responding and clarifying the requests identified in each issue above, DNR must review the remainder of the DEIS for additional areas of inconsistency, confusion, or simple inaccuracy to ensure the reviewing public and decision makers have the correct information. Frankly, these inconsistencies, insufficient data, and errors make informed and constructive public comment and decision-making impossible. **The DEIS should be corrected and reissued**.

II: Inventory Data and Modeling Methodology:

The development of a sustainable harvest level requires an estimate of how much volume can be grown and harvested on a landscape on an ongoing basis. In the case of DNR and the scope of the DEIS, the department is identifying how much can be harvested over the next decade (FY15 to FY24), complying with DNR's 1997 HCP and other regulatory obligations while meeting its trust mandate. The goal of this current process should be to maximize the current return to trust beneficiaries (in terms of volume – board feet of timber) without prejudicing DNR's ability to fulfill its intergenerational equity obligations in future decades.[4] The success of a process such as this for any large forest landowner relies on the quality and quantity of detailed information based on real world objective data.

An up-to-date inventory and mapping system which objectively correlate to real world conditions are the primary basis for an accurate sustainable harvest calculation. **It appears from our review that neither exists**.

Another key step in the development of a sustainable harvest calculation is the development of reliable and accurate growth and yield tables. These are used to produce an estimate of growth, typically by measure of volume, and involve some degree of imprecision. However, a valid estimate of growth is not biased.

Unfortunately, DNR's estimate of growth is repeatedly biased in one direction – downward. Its most basic components do not reflect the easily proven reality of DNR's data about the trust

[4] If DNR has adopted policies not required by the HCP, the Forest Practices Rules or intergenerational equity which further restrict the sustainable harvest, the effect of those policies should be clearly identified in the DEIS so that the public and decision-makers can determine the source of those policies and whether they are necessary and consistent with the state's fiduciary duties to the beneficiaries.

lands it manages. The result is that DNR's modeling significantly understates the volume of timber that can be sustainably harvested for the next decade while fulfilling its trust mandate and legal and regulatory obligations. Adoption of DNR's estimate would violate its trust obligations, including the duty to exercise reasonable care and the duty of undivided loyalty to the trust beneficiaries. It reflects a failure to use the degree of care and skill that should be expected of a prudent forest manager. The estimate should be rejected and DNR should be directed to redo the calculation based on provably correct data.

Issue 9: Flawed Inventory.

It is our understanding the DNR has replaced its Forest Resource Inventory System (FRIS) with what it now calls "RS FRIS," or Remote Sensing Forest Resource Inventory System. FRIS, or now RS FRIS, is the term for DNR's working inventory system. Prior to 2012, FRIS was used to store and maintain the inventory of timber on the landscape managed by DNR. Sometime around 2015, DNR transitioned to RS FRIS. Rather than conducting on-the-ground sampling of stands as was done with FRIS, RS FRIS utilizes LiDAR (Light Detection and Ranging) to collect forest inventory data on both a tree- and stand–level basis across the DNR's ownership. LiDAR is used to estimate heights of trees and identify softwood (evergreen) versus hardwood (deciduous) trees in stands across the forest. LiDAR can be used effectively to estimate the height of trees within a stand more accurately than human ground based observations. However, it has not developed to the sophistication of being able to differentiate between conifer species within a forest stand. , or to provide accurate numbers of trees per acre and accurate diameter measurements of trees. This differentiation of species, as well as more accurate trees per acre and diameter measurements of the trees, both key parts of stand inventory development, must be accomplished with ground based human observations.

In its simplest form, RS FRIS is a collection of processes to maintain and store forest inventory, which is then used to predict forest growth for purposes of HCP compliance, and to predict habitat development on the landscape. Historically, for any prudent forest manager, the core of an inventory system has been ground based survey plots to sample actual field conditions of forest stands. It is our understanding that under the FRIS system, DNR discontinued these survey plots sometime in the early 2000s. A sophisticated large landowner typically has plots at a density of one for every four to 15 acres. To make a process such as this less cumbersome, most large landowners conduct surveys on stands several years apart.

Since discontinuation of field surveys, updates to FRIS have consisted of "depleting," or removing from inventory, timber harvested, without any process for updating inventory due to growth, disturbance or other change. RS FRIS is an effort by DNR to update its inventory while minimizing costs associated with this work. However, as data often misrepresents real world findings, the model still requires field verification data. Though LiDAR offers a lower cost

alternative to traditional field sampling protocols, the technology has not matured to a point where other landowners have broadly adopted LiDAR as a full-scale inventory system – certainly not for a complex, multi-billion-dollar asset such as Washington state's trust lands. It is not a basis for determining inventory to the exclusion or extreme minimization of field sampling. While use of LiDAR for inventory may produce accurate tree height information, it is nearly impossible to determine species mix or obtain accurate diameters including DBH (Diameter at Breast Height) measurements from LiDAR. These diameters, coupled with height, are key to the development of Form Factors[5]. Form Factors are used in the development of growth and yield tables and will be discussed in more detail later in this document. It has been reported that DNR now has approximately 1,100 ground plots to verify the LiDAR data. In contrast to the plot density mentioned earlier of one plot for every four to 15 acres, these plots equate to approximately 1 plot per 1,270 acres, a significantly less dense sample rate than the current standard of practice for sophisticated land managers.

Due to a lack of updating the old inventory system with real world data and the implementation of a new system yet to be proven for accuracy, DNR's inventory system is fatally flawed and unable to predict current or future inventory levels. It simply does not accurately reflect real world conditions of DNR's forests.

Issue 10: Flawed GIS (mapping):

DNR's Geographic Inventory System (GIS) is the foundation from which the FRIS or RS FRIS inventory should be applied. But DNR's GIS data has numerous flaws and potential for bias. The Resource Inventory Unit or "riu" layer is the foundation for DNR's GIS. It should reflect all stands existing at the end of 2012. But it has obviously been allowed to become inaccurate over time. For instance, the GIS has 13,359 supposed "stands" that are 0.2 acres or less.

The "riu" layer has only been "depleted" since 2012. But since the early 2000s, DNR has not maintained any organized process for field sampling, so the accuracy of the stand descriptions as of 2012 are unknown. The inaccuracy is compounded because harvest areas since 2012 are then overlaid onto the "riu" layer (see fig 1) and this is not done accurately. It is not possible to

[5] Form factor. The ratio, expressed decimally, between the volume of a tree, or portion of a tree, and of a cylinder of the same height and diameter. The volume of this cylinder multiplied by the form factor gives the actual volume of the tree or portion of the tree. Three kinds of form factors are distinguished, according to the portion of the tree to which they refer: A Tree form factor is used for determining the actual volume of the whole tree; a Stem form factor for determining the volume of the stem; and a Timber form factor for determining the merchantable contents of stem, crown, or both. A form factor is called absolute when the diameter of the tree is measured at any convenient height, the form factor referring only to that portion of the tree above the point at which the diameter is measured; normal, when the diameter is measured at a height in constant ratio to the total height of the tree; and artificial, when the breast high diameter is measured. (TERMS USED IN FORESTRY AND LOGGING. U. S. DEPARTMENT OF AGRICULTURE, BUREAU OF FORESTRY—BULLETIN No. 61. GIFFORD PINCHOT, Forester. 1905)

determine whether harvests are delineated in the GIS based on the sale packet or proposed sales, before the sales packet is developed, but the actual harvest area frequently does not reflect what is entered into the GIS.

These inaccuracies can be seen in in Figure 2 below. Areas were clearly harvested that are outside the sale area delineated in the GIS, and areas within the sale area are not identified as harvested. The result is that the GIS has become significantly inaccurate as a representation of what is on the ground. Using the DNR's current methodology the GIS has become more inaccurate with each passing year of harvest activity. Since understanding the acres of available ground to grow trees is the foundation of maximizing return to the beneficiaries, it is critical that DNR's mapping system (GIS) represent real world conditions. Harvest volumes and accomplishment of habitat threshold goals are just two key items that rely on an accurately portrayed land base.

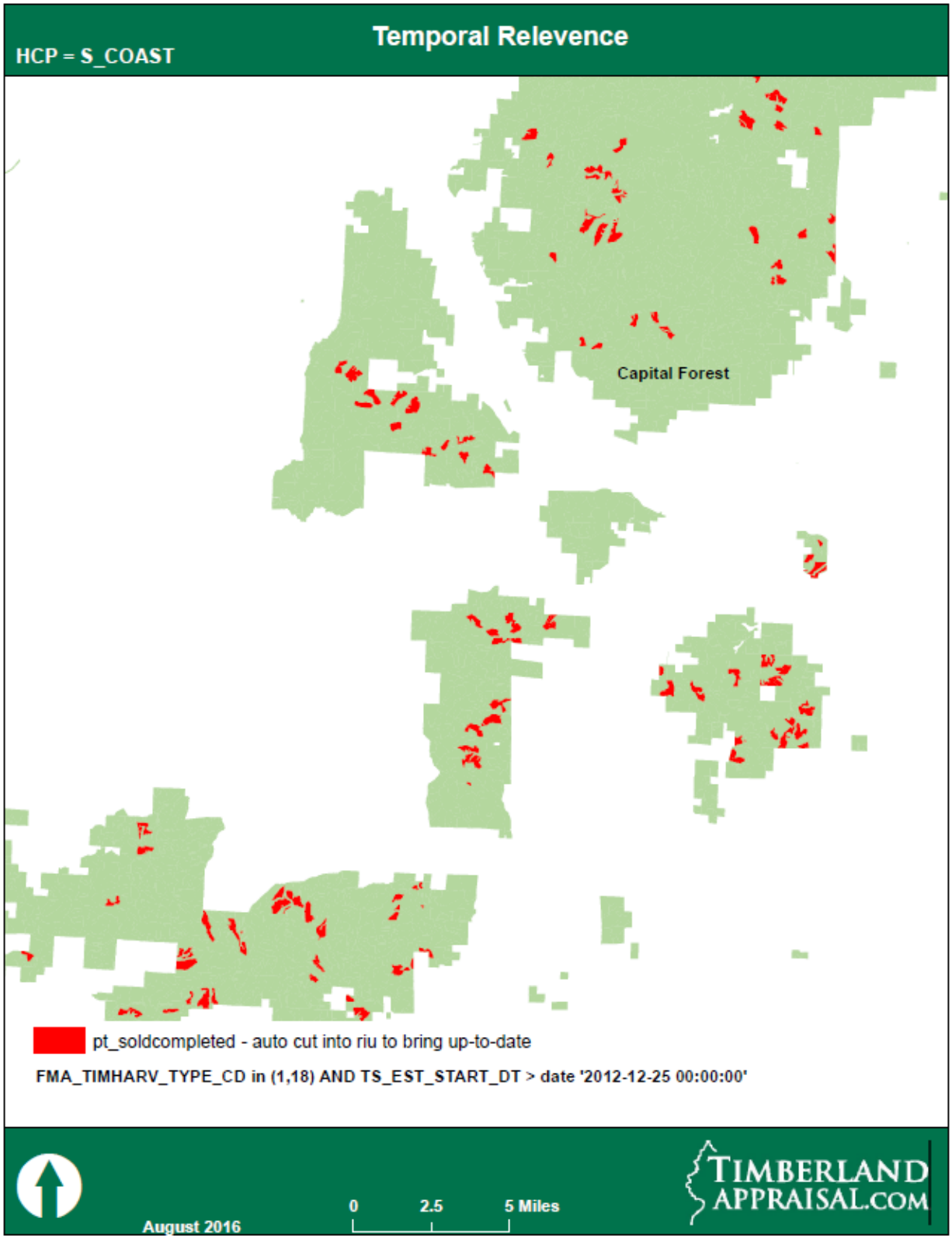


Figure 1- Showing completed sold sales overlaid on riu layer

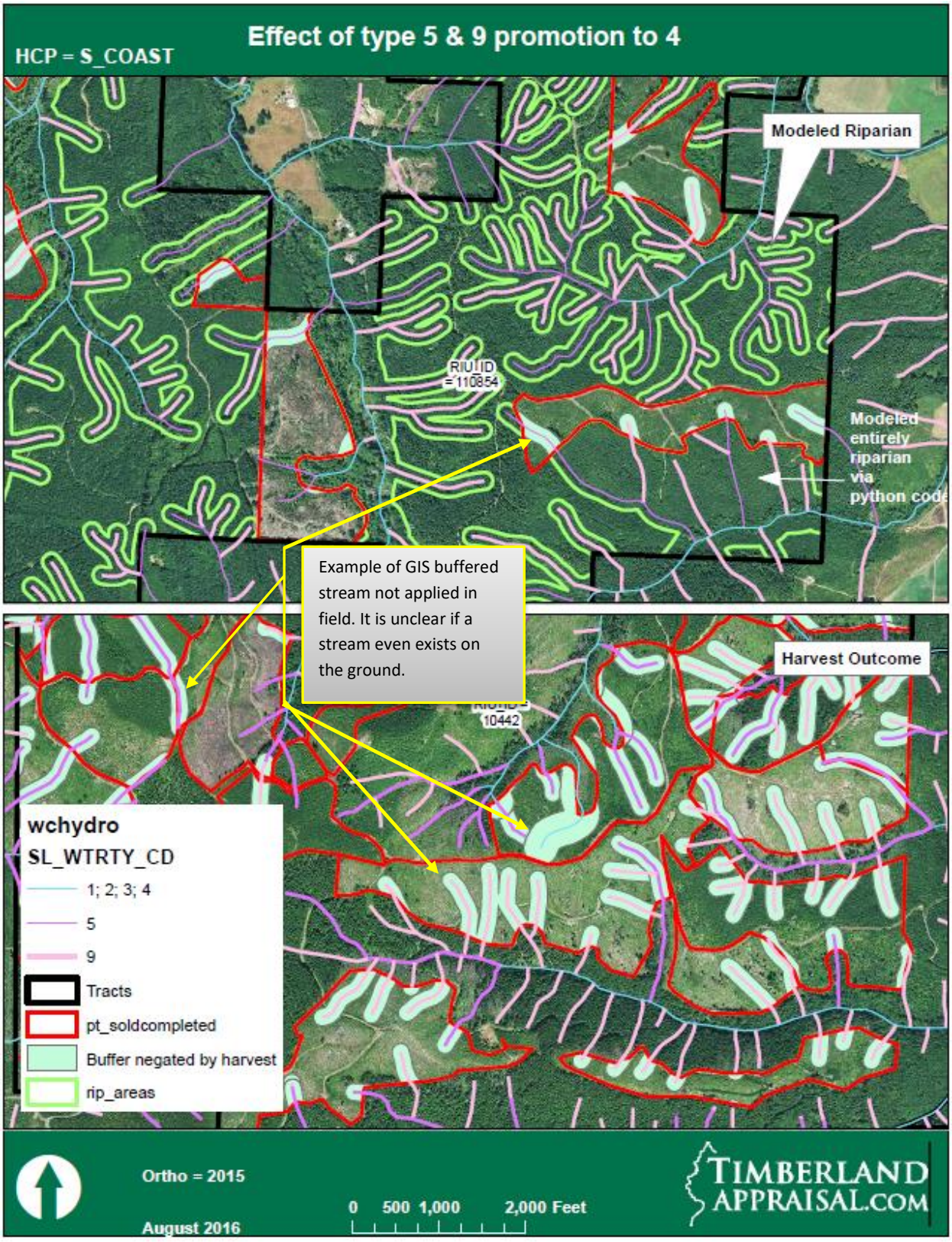
Figure 2- Map showing spatial mapping errors in GIS

Issue 11. Flawed Buffering Assumptions:

In addition to the GIS mapping errors identified above, DNR has applied buffers to streams using a method that does not reflect adopted policy, HCP requirements, or on the ground implementation. The most significant excess buffering issue involves DNR applying buffers to Type 5 and Type 9 streams. Type 5 streams are small, often non-perennial, streams and Type 9 streams are potential streams based on DNR's stream type modeling process. The stream modeling process uses GIS and slope analysis software to model the existence and size of streams on the landscape. Under the 1997 HCP, DNR is not required to buffer these streams. See DEIS p. 3-21. Type 4 streams receive a 100-foot-wide both sides buffer starting at the edge of the 100-year flood plain of the stream. In spite of no requirement to buffer Type 5 streams, DNR's GIS system buffers Type 5 and Type 9 streams as if they were Type 4 streams. The figure below depicts the over-estimation of stream buffers applied via GIS as compared to actual on-the-ground application.

DNR also applies a windthrow buffer to Type 1, 2, and 3 streams, with Type 4 streams included in the Olympic Experimental State Forest (OESF). This buffer is not only applied in DNR's GIS to areas susceptible to windthrow on the windward side of the stream, but instead to *all areas* equally dispersed (50-50) on both sides of the stream buffers.

Applying stream and windthrow buffers that are simply not required overstates the amount of riparian area on the landscape, which will artificially reduce the number of available acres for upland management and potential timber harvests.


Effect of type 5 & 9 promotion to 4
HCP = S_COAST
Modeled Riparian
RIUID = 110854
Modeled entirely riparian via python cod
Example of GIS buffered stream not applied in field. It is unclear if a stream even exists on the ground.
Harvest Outcome
10442
wchydro
SL_WTRTY_CD
1; 2; 3; 4
5
9
Tracts
pt_soldcompleted
Buffer negated by harvest
rip_areas
Ortho = 2015
August 2016
0 500 1,000 2,000 Feet
TIMBERLAND APPRAISAL.COM

Issue 12. Flawed Growth and Yield Modeling:

With no up-to-date inventory and a flawed GIS, DNR is unable to project future growth based on those tools which a prudent forest manager would normally rely on. Instead, DNR has one program which projects growth and yield of older stands (greater than age 30) without the actual data typically used. The Forest Vegetation Simulator (FVS) is the model that DNR uses to project growth and yield.

The way the DNR uses FVS is inherently flawed. FVS has essentially no ability to project or model the growth of young trees, especially those under age 30. To address this deficiency, young stand growth and yield models such as CONIFERS have been developed to work with FVS. DNR does not use CONIFERS or other growth modeling software that models young stands.

The data DNR inputs to FVS is not based on real data. Instead, DNR inputs artificial plot data, not developed from a field based inventory.

The initial stratum (grouping of species, site and associated ages) structure used in the yield file is relatively similar:

- 10 total plots
- 2 trees (species) per plot
- Each plot totals 800 trees per acre (TPA), which is split between 600 TPA for this dominant species and 200 TPA for the secondary species
- Each tree is represented by a diameter of .1'' per height of 1'
- There are no ages or site indexes passed to FVS

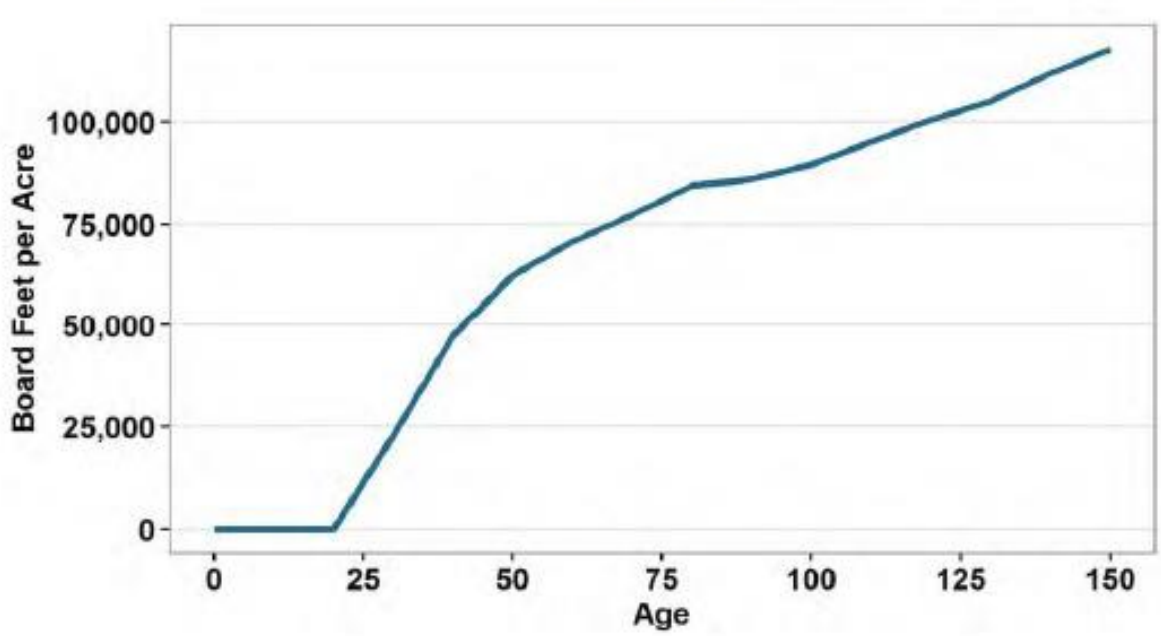
As displayed below, these tree lists are essentially 'dummy' or 'generic' trees, which purport to represent an actual DNR strata or stand. This hypothetical stand does not exist in real life. It is purely a dummy input to DNR's FVS modeling process. Nor does it represent the typical planting densities (trees per acre) that DNR or any other large forest landowner would use. Planting densities for a primary species (in the case below, Douglas fir - DF) are in the range of 400 trees per acre +/- 50 trees per acre, not the 600 trees per acre represented below. The excess trees (~200 DF and 200 WH [western hemlock]) is DNR's attempt to model naturally seeded trees at the time of planting, which does not represent reality, nor does DNR cite any data to back this assumption up.

Table 3, Example Tree List for FVS Input

Stand ID	Stand Plot ID	Plot ID	Tree ID	Tree Count	History	Species	DBH	Ht
UT_1_SFX_PN_DF	UT_1_SFX_PN_DF	1	1	600	1	DF	0.1	1
UT_1_SFX_PN_DF	UT_1_SFX_PN_DF	1	2	200	1	WH	0.1	1
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
UT_1_SFX_PN_DF	UT_1_SFX_PN_DF	10	1	600	1	DF	0.1	1
UT_1_SFX_PN_DF	UT_1_SFX_PN_DF	10	2	200	1	WH	0.1	1

Table 3 above shows the way in which trees are implemented into FVS. The basis of the model is not in fact 'trees', but rather dummy regeneration stands that input to the model in order to create the overall shape of the yield curves. The figure below shows an example of the raw output achieved by running FVS with these baseline assumptions:

Figure 7, Base FVS Yield Output



As shown, based on the dummy stand input data, FVS projects a yield of over 75,000 board feet per acre at age 75. Anyone with experience in Western Washington forests knows that projection is too high. It was expected that the baseline yields / growth rates would be high with the way the DNR uses FVS. This is an artifact of the DNR's use of FVS, which is not accurate with young trees, and the fact that 'dummy' trees are used as the base. With that said, FVS produces a 'curve shape' for DNR's growth and yield projections without utilizing any actual forest inventory measurements. It is thus purely hypothetical.

DNR acknowledged their yield curves were artificially high and undertook a process to "calibrate" the curves. The DNR uses FRIS-derived data to attempt to calibrate the curves. DNR

fits these to the 80th percentile, ensuring that 20% of observed data lie above the fitted curve, and 80% lie below. The method used by DNR can be a helpful strategy; however, this method will also fit any shaped curve to the data. A graphical representation of this approach is shown in the figure (fig 3) below. Here, the cross-hairs represent the raw strata (LiDAR with ground based verification plots and closer to real world) data, the dark blue line represents the FVS-yield, and the dark red line represents the calibrated yield using the 80th percentile. Selection of the 80th percentile appears largely subjective and not based on any forest inventory analysis.

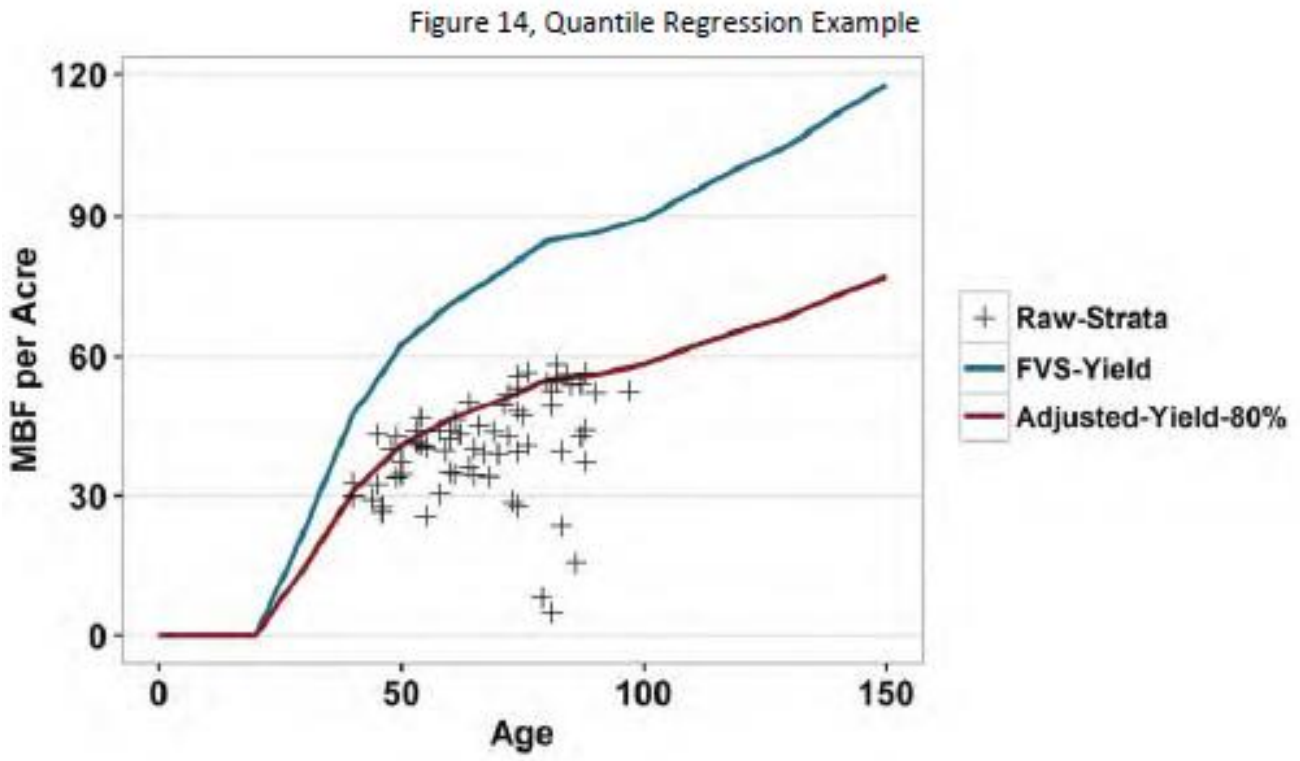


Figure 3- Example of DNR's calibration strategy

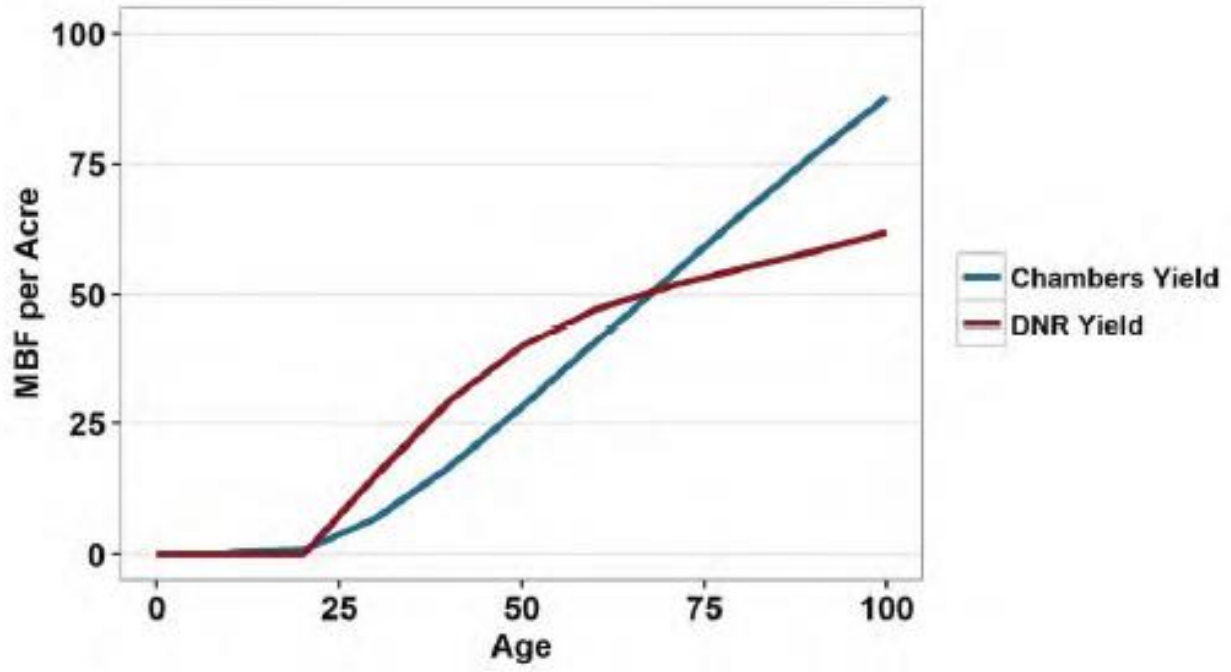
In the graphic below, 'Chambers[6] Yield' curve is taken from 'Empirical Growth and Yield Tables for the Douglas fir Zone', DNR Report No. 41, and uses the equation for "Table 9 (Scribner Board-Foot Volume per Acre, 6-inch top, 32-foot logs)" in that publication. In Figure 17 below, AFRC assumed a normally stocked stand with a Site Index of 120. The 'DNR Yield' is the "adjusted yield" line taken from Figure 3 (Figure 14, Quantile Regression Example) above, which shows a Site Class 2[7] curve for their most used stratum.

[6] Charles Chambers is a biometrician who worked for DNR and developed the original DNR yield curves based on real world field-collected observations.

[7] **Site class** is a specific grouping of site index values. **Site index** is a measure of site productivity and is defined as the height of a dominant tree (usually in feet) over a defined base age period - 50 or 100 years. **Site productivity** is

By age 70, when compared to the Chambers curve that was developed with actual field data, the growth rates DNR uses from FVS are far too conservative compared to what is expected. This is the result from using FVS to model young stands, using "dummy" tree lists, and then using a curve fitting method which would fit any line to the scatter of data. The yield curves used by the DNR are not the correct magnitude or shape as would be expected from its own forest inventory data or other established yield models.

Figure 17, Chambers Yield Equation vs. DNR Yield



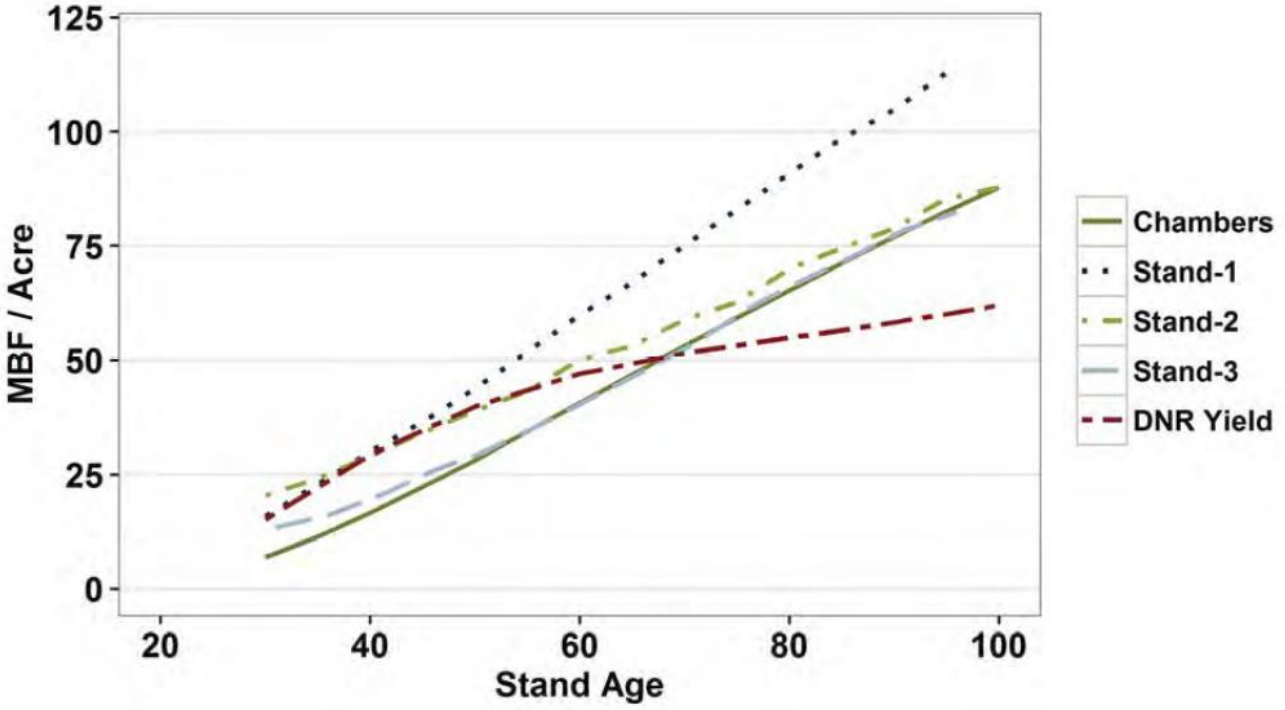
Further evidence of the flawed growth curves developed by DNR can be seen in the graph below. This graph shows how the DNR yields compare to both Chambers' yields as well as yields created by using ORGANON.[8]For this comparison, three tree lists from the FRIS LiDAR data set were taken and grown for 100 years using ORGANON. The tree lists assumed a site index of 120' and all began at age 30. There were no ages associated with the LiDAR data, so volume per acre estimates were calculated for the strata yield per 1-year age interval, then used to extract stands in the LiDAR data that had similar yields. Overall, the DNR yield remains in the middle of the pack for the first several decades, but slows down dramatically after about 70 years. These two widely-used yield models (Chambers and ORGANON) directly contradict the yields developed by the DNR.

---

the combined effect of physical and climate properties - soil depth, texture, nutrient load, precipitation, temperature, slope, elevation, and aspect - on tree growth.

[8] ORGANON is a growth model used in the Pacific Northwest and models individual tree growth and can model a variety of management prescriptions.

Figure 19, Chambers Yields vs. DNR Yields vs. ORGANON Yields



DNR's use of LiDAR data in this instance does not correct for the flaws in FVS. There has been a considerable amount of effort over the last several years by the DNR to collect data using LiDAR. This collected LiDAR data is primarily what DNR used to calibrate the FVS yields. As discussed in the section above, the overall *yields* (in terms of volume per acre) are "calibrated;" however, there still remains a tremendous amount of underlying variation (diameters, trees per acre, etc.) within the tree lists that comprise those yields. The DNR yields lack any real-world tree descriptions, which results in unlikely diameter distributions as the forest matures. As shown below, even with the "calibration" of the total yields that DNR has done with LiDAR, its modeling does not reflect important characteristics of its forests that can be seen in LiDAR data. In particular, FVS does not recognize the habitat qualities that exist in DNR stands.

One of the driving variables in the habitat definitions is the quadratic mean diameter ("QMD")[9], which is looked at below in greater detail. The figure below shows how the QMD of the LiDAR

[9] Quadratic mean diameter (QMD) is the measure of the average tree diameter in a stand and is more representative than using the arithmetic mean diameter. See also: Why Quadratic Mean Diameter? The historical and practical reasons for this convention are reviewed. West. J. Appl. For. 15(3):137-139. Robert 0. Curtis and David D. Marshall, Pacific Northwest Research Station, 3625-93rd Avenue SW, Olympia WA 98512-9193. https://www.fs.fed.us/pnw/olympia/silv/publications/opt/436_CurtisMarshall2000.pdf

data compares to the QMD of an FVS yield (same strata as used above).[10] Overall, the QMDs that are displayed in the forest inventory, as shown by LiDAR data, are greater than those computed using FVS. This means that the habitat qualities shown by LiDAR data are greater than those recognized by FVS as DNR uses it. **Thus, it is not possible for the reviewer to determine if habitat conditions on the landscape are reported accurately or, more likely, understated due to the influence of the way in which FVS is used**.

Figure 20, LiDAR vs. FVS QMD by Volume Class

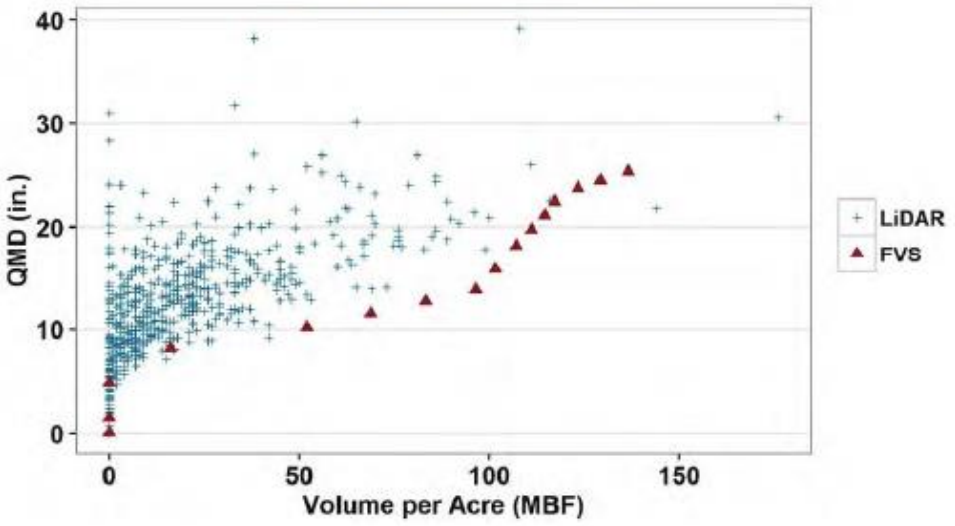
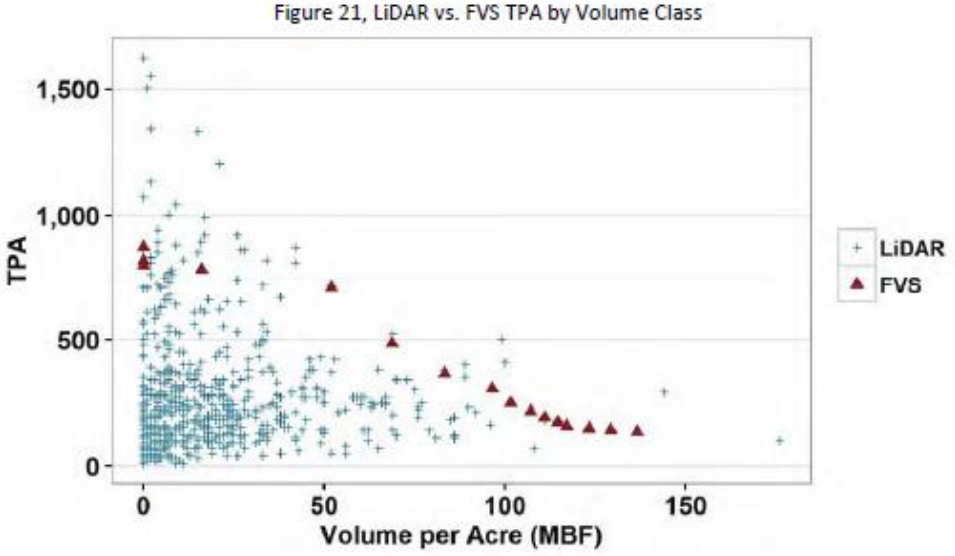


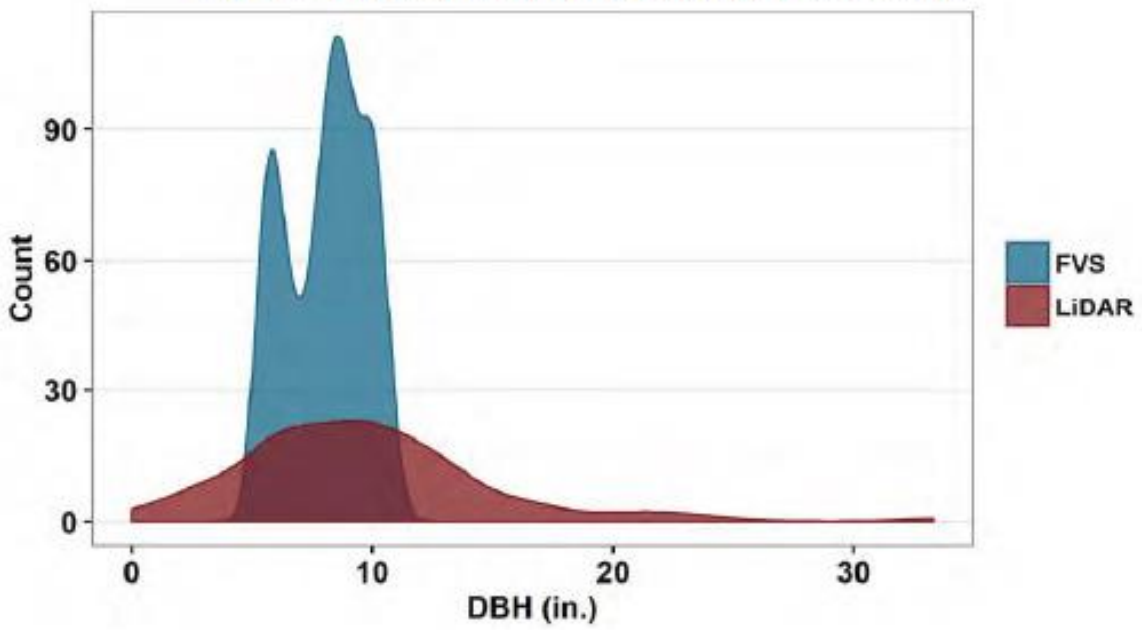
Figure 21, LiDAR vs. FVS TPA by Volume Class



[10] There are no ages provided in the LiDAR inventory, so volume per acre classes were computed (in 1,000 board foot increments).

We can then focus in on one 'point' per group to illustrate this further. The figures below show the distribution of DBHs and heights for the LiDAR data and FVS data for the volume group of 16,000 thousand board feet (MBF) per acre. Because DNR is using a dummy variable approach that starts with a hypothetical stand that is not what one would expect, their results are centered on a tight band of DBH / height ranges, whereas the DBH distribution of the LiDAR data is much more dispersed, with a greater number of large trees.

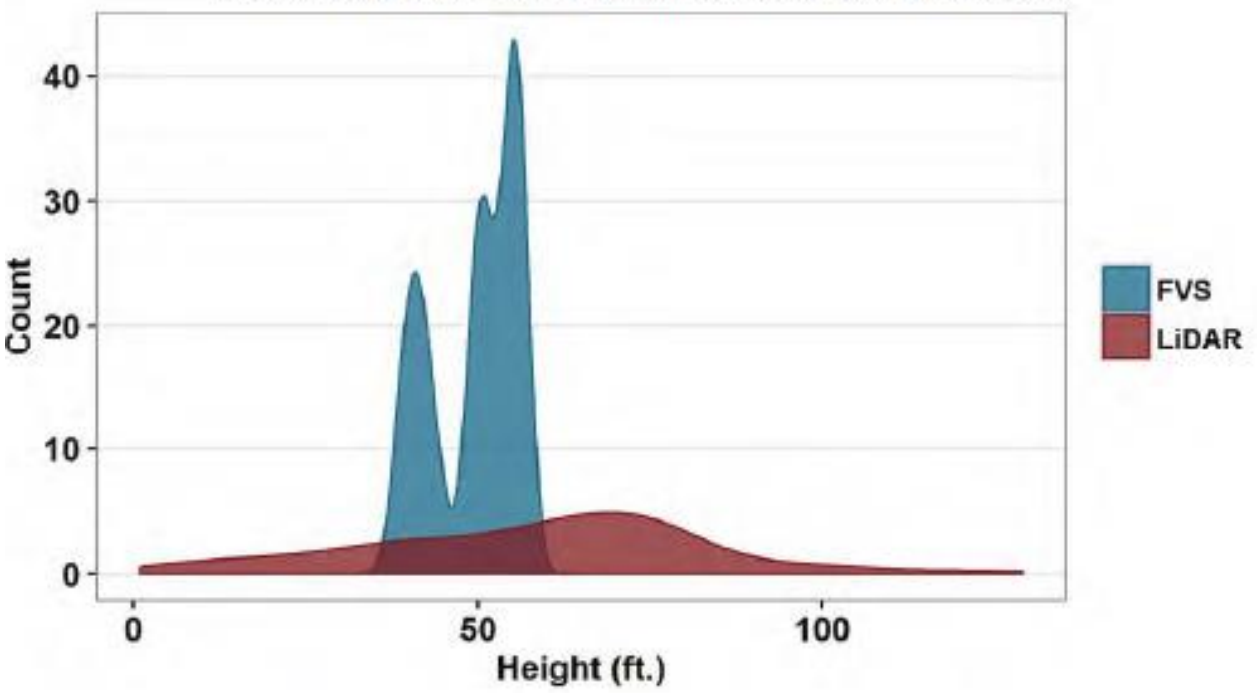
Figure 22, LiDAR vs. FVS DBH Distributions, Volume Group 16,000



The mean DBH of the FVS tree list is roughly 8 inches, whereas the LiDAR mean DBH is 9.6 inches. While the means are close, the LiDAR data is more dispersed. Whatever imprecision there is to LiDAR data, it is real data about the forest, while the FVS data is not in fact real data. Thus, one must assume the LiDAR data gives a picture closer to reality than FVS.

Similarly, as shown below, the mean height of the FVS tree list data (at 16,000 board feet per acre) is 50 feet whereas the LiDAR data shows it closer to 60 feet, and LiDAR demonstrates that there is more dispersion in the range of tree heights than FVS assumes. It is important to remember that the method in which DNR uses LiDAR data, the heights developed from LiDAR are more accurate than FVS, due to being based on real world observations.

Figure 23, LiDAR vs. FVS Height Distributions, Volume Group 16,000



- *Issue 12 summary:* The way in which the DNR uses FVS is flawed from the onset
    - FVS is not a young stand model, and DNR does not provide it with real data; rather, it uses artificial data for stands too young for FVS to model;
    - As a result, the tree lists, which are used to calculate habitat requirements, are flawed.
- The yield fitting process takes the FVS yields, which are not based in reality, and lowers them to attempt to meet DNR's LiDAR-based stratum data.
    - This leads to the overall yield estimates being too conservative;
    - Their overall shape (constructed by FVS) does not match what would be expected given normal stand growth based on real world data.
- Habitat requirements require very specific tree- and stand- level estimates such as diameters, tree heights, and number of trees per acre.

    - There is a wide range of variation in stand-level metrics such as QMD, trees per acre, and height, which would be reflected if DNR had real data to input into its growth and yield model. Based on DNR's current model inputs, there is a very narrow range of tree-level attributes that are modeled, such as future DBH and height distributions;

  - Both of the above-mentioned points then exacerbate the reliability of the 'yhabi' (this is the variable used to identify North Spotted Owl habitat) function, as it is based on tree-level data, which in this case is artificial.

- Further complications of not using real data in the modeling framework
  - Review of the raw LiDAR data and QMD / TPA outputs from FVS reveals major discrepancies:
    - QMDs are far lower in the FVS estimated data, which is an artifact of using dummy tree lists (tight range of DBHs and heights);
    - TPA estimates generated by FVS are far higher than LiDAR estimates.
- Overall, the simulated tree lists and yields are not representative of the actual DNR forest or their sampled inventory.
- This leads to significantly conservative yield estimates and under-modeled habitat in Woodstock (see discussion below).

Based on the above information and additional review work undertaken by AFRC, the Department's use of artificial data, loosely tied to real world stand data, produces an legally indefensible product that fails to meet its trust mandates and fulfill Objective #4 of the sustainable harvest calculation. (DEIS p. 1-3.)

Issue 13. Flawed Use of Woodstock:

Once DNR has done its growth and yield modeling with FVS, it then applies those growth projections to the inventory through a model called Woodstock. Woodstock calculates when and where harvests can occur, based on pre-programmed constraints.

DNR, via its GIS, creates a Large Data Overlay (LDO) which basically merges data layers and strips out unneeded data for the modeling process. Within the LDO lands are placed into three categories – General Ecological Management (GEM), which is the land that is subject to general management; Riparian (RIP), which are riparian and wetland areas, and Upland with Special Management Objectives (UPL), which are uplands within which management is restricted because of unstable slopes or wildlife habitat features or other similar restrictions. This GIS data (LDO) is loaded into Woodstock to provide the spatial reference to the forest stands it is scheduling for treatments. To control which acres are available for management in Woodstock, DNR places "LOCKs" to control land that is assumed to not be subject to management for the period of the lock. These "LOCKs" (which originate in the LDO) are placed on portions of all Land Classes: General Ecological Management (GEM), Riparian (RIP), and Upland with Special Management Objectives (UPL). Locks on the GEM lands are an additional withdrawal from management and timber harvest and make those lands unavailable to Woodstock to schedule

for treatment. Since many of the reasons (riparian, slope, etc.) for "LOCKs" are already separated out of the GEM lands and are already being modeled and accounted for in the LDO in other land classes, it is not clear why an additional 16% of the 880,000 acres of GEM lands is also "LOCKed" (removed from management) for most of the planning horizon (100 years). This leaves about 742,000 acres GEM lands available (50% of the net acres) for timber harvest and active management.

DNR's yield modeling uses two yields—one for total inventory volume and one for total harvestable volume. This difference is described by the DNR as "legacy tree" requirements from the HCP, but the DNR uses flawed modeling of the legacy tree requirement. Its model selects at least the ten largest trees from the stand to leave as legacy trees. The HCP, however requires leaving only two green trees, one of which is the largest, while the other is a dominate/co-dominate and eight snags (green or not) from dominate/co-dominate/minor species. DNR's modeling overstates the volume loss for "legacy tree" volume by 5-20%, which has serious implications for revenue generation for trust beneficiaries and timber volume outputs.

Another issue of the yield curves generated by the DNR is the very low growth rates in the mature ages. As described in the Growth and Yield section of the report, the flawed FVS yields are "hockey stick" shaped, due the use of dummy tree lists in FVS and young stand growth. The DNR's Woodstock model sets maximizing Net Present Value (NPV) as its objective and these non-representative growth curve shapes create bias. Revenues are calculated as a $/mbf (dollar per thousand board feet) which is volume based. So, non-representative growth curves which artificially suppress expected volumes per acre at harvest age can bias the Woodstock model into not scheduling acres for treatment due to low revenue per acre values.

The use of very low discount rates (2%) also influences the harvest ages selected by the model. Within Woodstock, it is scheduling treatments for forest stands based on the net present value (NPV) of that treatment. In basic terms, it calculates the revenue of a treatment by subtracting costs from income and then discounts that revenue value to present day dollars. The NPV calculation is sensitive to discount rates and in general the lower the discount rate the older a stand is scheduled for treatment and vice versa on higher discount rates the younger the stand is scheduled.

The DNR only models total volume per acre and breaks it out by Saw and CNS (commercial non-saw) product groups. DNR does not attempt to model species level volumes except for the broad land classification, but this does not describe the number of other species which exist on an acre and their volumes. This major weakness is compounded by the oversimplification of the prices and costs in the yield file. The Saw and CNS grades used are flawed because of the use of dummy tree lists which are too narrow and not representative of real world stands. Because FVS does not merchandize the logs, these product groups are only based on tree DBH, when in

fact larger trees will have both Saw and CNS logs within one tree. Since FVS does not break down a tree into marketable logs these volumes (Saw and CNS) are simply an estimate of the number of trees within the typical diameter ranges for these log types. So, Saw and CNS may be under- or over- stated, but there is no way to adequately know this. Thus, DNR modeling of Saw and CNS grade volumes are flawed and the revenues computed not representative of reality.

The current model inputs stumpage prices for each DNR region by species land type. The DNR is flawed in their use of stumpage prices this way. In stands where the trees are a majority of one species (e.g., Douglas fir or hemlock) this "camprun" approach may be reasonable, but when applied to species like western red cedar, and to a less degree red alder, it does not reflect reality. The species group is a land type which means it refers to acres and the volume that grows on those acres for applying the price. The model assumes that the primary species on an acre of land is the only species growing on that acre, and then applies the species price for that acre. In the case of red cedar, it is rare to find a pure stand and applying the $758/MBF price for red cedar to all the volume is incorrect. Because DNR has no actual inventory, DNR lacks species specific volume, and the assumptions it makes in its modeling are not accurate.

Finally, DNR states: *"The model is built with information on current conditions, management objectives, and management activities and an understanding of natural growth processes and how forests respond to management activities. By simultaneously considering all of this information, the model develops an optimal solution of which forest stands to harvest (when, where, and by what harvest method) and which stands not to harvest across state trust lands over time to meet both revenue production and ecological values objectives as effectively and efficiently as possible." (DEIS pg 2-6)* This statement is false. As shown previously, the majority of the stand data used is artificial and not representative of current conditions.

It is also an incorrect statement that the "*model develops an optimal solution of which forest stands to harvest (when, where, and by what harvest method) and which stands not to harvest across state trust lands over time." (DEIS pg 2-6)* The model aggregates stands at a macro level based on ten year age classes, not at the stand level with finer age classification. The latter would be required to accomplish this scheduling at the stand level as DNR claims to do. Rather, volumes by landscape by decade are identified and it is left to field staff to identify and schedule the individual stands.

Issue 14. Flawed Management Costs:

DNR's management costs are simplistic and do not reflect the disparity of the different areas and harvest methods in a given time period. In addition, DNR developed costs for timber sale preparation, such as variable density thinning and variable retention harvest, for which they do

not provide adequate documentation. DNR's use of words like "may be" is a direct indicator of lack of foundation.

DNR's use of the per acre harvest costs again demonstrates the simplicity of the implementation within its model. The DNR suggests that its indirect, direct and silviculture cost is based on recent historical spending levels. But the past blend of treatments is not likely to represent the future costs and blend of treatments. DNR's use of such aggregated costs nullifies the model's ability to make accurate financial predications. If the model thins more acres in the future which generates lower per acre yields, but assigns those thinnings the same indirect costs, these costs will be overstated. The DNR's use of per acre harvested costs ignore reality because slope, volume density, timber size and geography are all important factors in direct costs. It also ignores the reality that thinning operations require more acres to produce the same volume outputs as a variable retention harvest (VRH). Therefore, DNR field staff cover more acres (more field time) to produce the same volume as a VRH treatment. Using identical costs for both VRH and thinning projects does not make sense. It should be noted that, in other contexts, DNR has cited increased expense due to the lower volumes per acre removed from riparian treatments and increased time to complete riparian thinnings compared to VRH projects as the basis for not accomplishing riparian work at the levels expected.

It is indicated that the budget level constraint was not a "binding constraint". This could only be determined by viewing the opportunity cost associated with the budget constraint or the use of goals. The DNR needs to report on any binding and non-binding constraints and the associated opportunity costs (shadow prices) for them.

There is also no explanation or analysis showing the additional use of a 10% uncertainty factor to further reduce projected harvest volumes is justified. The modeling process already has additional uncertainty factors built in, such as reduction in growth by influence of legacy trees and excess buffering of streams beyond policy. Layering additional uncertainty on top of already very conservative assumptions does not appear to be in alignment with the need to maximize revenue to the beneficiaries. A detailed analysis of the need and appropriate application of conservative modeling assumptions and use of a 10% uncertainty factor is requested.

Section II Summary: Inventory Data and Modeling Methology

The information provided above is sufficient to show the significant flaws in the input data and methodology of the proposed sustainable harvest calculation. The lack of and poor quality of the inventory, coupled with unreliable mapping quality, buffering assumptions beyond adopted policy, and flawed modeling assumptions and methods do not provide the commenting public or the decision maker with adequate information to draw any conclusions about the

appropriate sustained harvest for the coming decade. DNR has not met the intent and requirements set forth in Objectives 2 and 4. (DEIS pp.1-2—1-3.)

DNR must develop a plan and procedure for updating its inventory, mapping system, and modeling (growth and yield, buffering, costs, revenues, etc.) using real data from its actual forest as the beginning step in re-analyzing and developing a sustainable harvest calculation for the planning decade. A prudent trust manager would have a quality accounting of the trust assets. It appears DNR does not and the trust beneficiaries and their customers deserve better.

III. LEGAL ISSUES.

Issue 15. The DEIS ignores DNR's paramount duty to the trusts.

From the description of the purpose, need, and objectives on pages 1-1—1-3, through the entire remainder of the DEIS, one consideration is absent: that DNR's paramount duty is to the trust beneficiaries, and that it has a duty of undivided loyalty to those beneficiaries. *C'ty of Skamania v. State*, 102 Wn.2d 127 (1984). The Board of Natural Resources is required to establish policies that "are based on sound principles designed to achieve the maximum effective development and use of trust lands and resources." RCW 43.30.215(2) (emphasis added). As trustee for the state forestland, DNR has a duty to produce long-term and short-term income for the trust beneficiaries, preserve productivity, and protect the forestland. *State Owned Forests v. Sutherland*, 124 Wn. App. 400 (2004). Although trust lands may be managed for multiple use, that is allowed only if additional uses are compatible with the DNR's financial obligations to trust beneficiaries. RCW 79.10.120. *Chuckanut Conservancy v. DNR*, 156 Wn.2d 274 (2010). DNR's proposed action inexplicably aims to violate the responsibility that is the foundation of DNR's administration of trust lands.

The DEIS says that each of the four action alternatives meets the purpose, need and objectives as stated on page S-1. If this were a sufficient range of alternatives, the Board could adopt only one of the four action alternatives described—the one that yields the highest annual volume of sales for the trust. But the DEIS fails to present a reasonable range of alternatives. It does not explain why other alternatives that might produce significantly more volume, while still meeting the need, purpose, and objectives were not considered. This violates SEPA. WAC 197-11-440(5); *Cascade Bicycle Club v. Puget Sound Reg'l Council*, 175 Wn. App. 494, 510 (Div. I 2013). A choice of one of these alternatives would be subject to challenge as "willful and unreasoning and taken without regard to the attending facts or circumstances." *Washington Indep. Tel. Ass'n v. Washington Utilities & Transp. Comm'n*, 148 Wn.2d 887, 904 (2003).

For instance, although the DEIS states that 82 percent of the state trust lands stands are currently in the competitive exclusion stage (DEIS, pp.3-16, 3-24), none of the alternatives involve significant thinning of those stands in the Columbia, North Puget, South Coast, or Straits regions. That is true even though DNR acknowledges that stands in the competitive exclusion stage provide essentially no wildlife habitat, DEIS at 3-24, and DNR has acknowledged that without thinning, they may continue in the competitive exclusion stage for more than a century. 2004 SHC FEIS,p. 4-19.

By contrast, the FEIS for the sustainable harvest level adopted in 2004 said that only 68 percent of the stands were in the competitive exclusion stage. Final Environmental Impact Statement on Alternatives for Sustainable Forest Management of State Trust Lands in Western Washington, DNR 2004 (2004 SHC FEIS) at 4-11. It appears that the forests have been backsliding in terms of the percentage of forests in competitive exclusion. Failure to thin stands that would benefit from thinning reduces both the current income to the trusts and the value of future growth on trust lands. Therefore, DNR's obligations as a trust manager require that it engage in active commercial thinning.

DNR must prepare and seriously consider at least one alternative that incorporates substantial amounts of thinning in stands in the competitive exclusion stage.

Issue 16. Confused method of dealing with the arrearage confounds informed decision making.

It appears that the alternatives that purport to harvest the arrearage from the previous planning decade instead merely increase the harvest in the next decade from lands available for "general management." That either means the actual sustained yield harvest should be higher than described, or that DNR is proposing to rob Peter (future decades) to pay Paul (make up for the prior arrearage). Neither approach complies with RCW 79.10.330.

Viewed on a trust-by-trust basis, there is an arrearage of 702 MMBF from the 2004-2013 planning decade. (DEIS p. 2-8.) That includes approximately 375 MMBF from the federal trusts, 220 MMBF on the OESF, and 75 MMBF distributed over the Capitol State Forest and the trusts of six counties.[11] DEIS App. C, p. C-10.

RCW 79.10.330 sets forth DNR's obligations when there is an arrearage:

> If an arrearage exists at the end of any planning decade, the department shall conduct an analysis of alternatives to determine the course of action regarding the arrearage which provides the greatest return to the trusts based upon economic conditions then existing and forecast, as well as impacts on the environment of harvesting the additional timber. The department shall offer for sale the arrearage in addition to the sustainable harvest level adopted by the board of natural resources for the next planning decade if the analysis determined doing so will provide the greatest return to the trusts. (Emphasis added.)

This direction explicitly requires DNR to provide an analysis that allows the Board to determine whether it is in the best interest of the trusts to harvest the arrearage in addition to the sustained yield adopted for the coming decade. AFRC finds no evidence DNR conducted an economic analysis of the arrearage

[11] Ten counties apparently had more than their sustained yield harvest cut during the 2004-2013 decade, which leads DNR to also calculate an alternative arrearage number of 462 MMBF, deducting the surplus harvest of those counties from the arrearage of the federal trusts, the OESF, the Capitol State forest, and Clallam, Skamania, Whatcom, Wahkiakum, King, and Pacific Counties. DEIS App. C, at. C-10. Alternatives 3 and 4 purport to harvest the 462 MMBF, but only from the trusts that sustained a deficit in the previous decade. But the deficit of those trusts was 702 MMBF, so if the trusts that sustained a deficit recover only 462 MMBF, they will not recover their full arrearage.

to determine what was in the best interest of the beneficiaries. Nor is it clear to the reviewer or decision maker what the specific impacts to the SHC targets are from the arrearage other than simple addition. Which seems rather simplistic considering the efforts to create a complex model analysis.

The arrearage is not just a number. It is real stands of trees, on the ground, that were not harvested or thinned during the previous planning decade, although under the previous sustained yield plan, they should have been harvested or thinned. To comply with RCW 79.10.330, DNR must identify where that arrearage is, and then provide an analysis of whether cutting it, in addition to the sustainable harvest for the coming decade, is in the best interest of the trusts.

Issue 17. The DEIS provides no basis for the decision-maker to understand what choices will have effects on harvest levels or why the choices appear to have so little impact once the arrearage harvest is subtracted.

An EIS need only consider a reasonable range of alternatives, and it is also correct that the decision-maker may select a somewhat different alternative, so long as the impacts of the selection are within the range of alternatives disclosed in the EIS. But to be adequate, the EIS must provide enough information so that the decision-maker can understand the effects of his or her choices. The way that the DEIS is structured, it is impossible to understand what choices make what difference in terms of outcome. Thus, the range of alternatives does not offer the decision-maker a real choice and obscures the impacts of the choice from the agency and the public. This falls far short of the core purpose of SEPA. "The point of an EIS is not to evaluate agency decisions after they are made, but rather to provide environmental information to assist with *making* those decisions." *King Cty. v. Washington State Boundary Review Bd. for King Cty.*, 122 Wn.2d 648, 666 (1993).

The four action alternatives are described as including a combination of three factors: different volumes and schedules for harvesting the arrearage, different plans to thin within the riparian areas, and the different long-term conservation strategies for the marbled murrelet. But as shown above, when the volume of arrearage is subtracted from the alternatives, Alternatives 3, 4, and 5 are effectively identical in their sustained yield numbers. That makes no sense. Alternatives 3, 4 and 5 are identical in thinning an insignificant amount of riparian area. Alternative 3, however, uses marbled murrelet Alternative D; Alternative 5 uses marbled murrelet Alternative F. Marbled murrelet Alternative D protects 51,000 acres of potential habitat in addition to the 10,000 acres of occupied habitat; Alternative F protects 151,000 acres of potential habitat in addition to the 10,000 acres of occupied habitat. There is no reason (or explanation) for why the sustained yield would be identical when there is 100,000-acre difference in the size of the land base. That must be explained.

Alternative 2 differs from Alternative 5 in two respects. First, it incorporates Alternative B of the marbled murrelet long-term conservation strategy. Alternative B protects only the 10,000 acres of occupied habitat—or 141,000 acres less than Alternative F, used in Alternative 5.[12] But Alternative 2 also calls for thinning 10 percent of the riparian areas over the decade, while Alternative 5 has negligible

[12] 141,000 acres is 12 percent of the trust land base of roughly 1.2 million acres of trust land in western Washington.

thinning of riparian areas. In the previous decade, DNR planned to harvest 394 MMBF, or 39 MBF/year, from the riparian areas. DEIS App. C, at C-9. Yet the difference between the projected harvest for Alternative 2, with both thinning of ten percent of the riparian area and an additional 141,000 acres of land not restricted by marbled murrelets, is only 21 MMBF/year. That makes no sense, and must be explained.

For an EIS to be adequate, it must provide adequate information so that the decision-makers can understand the implications of their decisions. Assuming for purposes of argument that the EIS has considered an adequate range of alternatives, the DEIS provides no basis for decision-makers to understand the implications to the trusts of the choices they might make. The numbers do not comport with any basic understanding of the silviculture and the land base in question here. The DEIS fails to establish a reasonable foundation for any further action.

Issue 18. The DEIS must consider alternatives that manage habitat areas.

As described above, the previous decade's sustained yield calculation assumed that 394 MMBF would be harvested from riparian areas, and that significant volume would be harvested in spotted owl management areas, including the OESF, in order both to contribute volume and revenue and to fulfill DNR's goals under its HCP. The EIS for the previous decade's sustainable harvest calculation made it clear that in the absence of active management, very little of the then 68 percent of the trust lands in the competitive exclusion stage, 2004 FEIS at 4-11, would become habitat within the life of the HCP.

The DEIS makes it clear that DNR has essentially failed to manage either the riparian areas or the spotted owl management areas. As a result, the current sustained yield model simply puts all those areas off limits going forward. (Alternative 2 does propose to thin ten percent of the riparian areas, although it does not explain how DNR will do so, when it failed to harvest those areas in the past decade.)

The failure to harvest or thin in riparian areas has not been for lack of a market—the areas that would be thinned are primarily alder, and alder mills have been hungry for logs during much of the last decade. The failure to harvest or thin in owl management areas may have been attributable to the economy during the worst of the 2008 recession, but during much of the last decade there has been demand from mills in owl areas. Nor is there a history of sales that were offered but did not receive bids. The problem has predominantly been that DNR has not offered the sales.

DNR cannot fulfill its duty to the trust beneficiaries if it does not manage the trust lands. If there are constraints that prevent it from doing so, the DEIS must explain those constraints and explain what would be necessary for the situation to change. Only if the DEIS does so will decision-makers have the information they need in order to make reasonable decisions as to how DNR can fulfill its trust responsibilities.

Issue 19. Commercial thinning must be increased in the sustained yield harvest.

As discussed above, the DEIS discloses that 82 percent of the state trust lands are currently in the competitive exclusion stage. That is an increase from 68 percent in 2004. (2004 SHC FEIS, p. 4-11.) DNR's current modeling assumes that at age 30, its stands have 800 trees per acre, with 600 trees of the dominant species and 200 trees of the secondary species. As described above, we believe that assumption of 800 trees per acre is likely false, and that it fundamentally distorts the modeling effort. But if it were true, it would reflect malpractice by the forest manager.

DNR needs to be thinning its stands, at least once, if not more than once, during their rotation. Yet comparing each of the four action alternatives to the "no-action" alternative (which is continuation of the prior sustained yield harvest), DNR proposes to reduce the number of acres it thins in the next decade from what it planned for the previous decade. Because the DEIS provides only bar charts, not actual acreage numbers, these comparisons are at best approximate. But the comparison of thinning acres by region is roughly as follows:[13]

Region	Alt. 1 (2004-2013 sustained yield plan)	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Columbia	1,000 ac.	600 ac.	300 ac.	300 ac.	300 ac.
N. Puget	1,700 ac.	1,150 ac.	800 ac.	800 ac.	200 ac.
S. Coast	550 ac.	400 ac.	200 ac.	200 ac.	200 ac.
S. Puget	1,050 ac.	800 ac.	550 ac.	550 ac.	100 ac.

The prior decade's plan arguably would have left far too many stands unthinned throughout their rotation. The four action alternatives for the next decade reduce the planned thinning aces to a fraction of the prior decade's plan. From the perspective of competent forest management, the lack of thinning being proposed here is inexcusable. It is inexcusable because it deprives the trusts of income during the typically 70-year rotation, and it is inexcusable because the opportunity to concentrate growth on higher-value trees over the course of the rotation is lost. It is inexcusable from AFRC's perspective because it reduces the volume available to its member mills.

If there are reasons why DNR cannot conduct more thinning of its overstocked stands, the DEIS needs to disclose those reasons, so that the Board of Natural Resources can make a reasoned decision about actions it can take to improve DNR's silviculture. It is unacceptable for DNR to simply conclude that because thinning requires too much effort, DNR won't do it.

[13] All the alternatives follow the adopted OESF plan.

Section III SUMMARY: LEGAL ISSUES

By ignoring the paramount duty to the trusts, failing to comply with statutory requirements for dealing with the arrearage, failing to consider alternatives that manage habitat areas and failing to plan for commercial thinning, the DEIS is fatally and legally flawed and must be revised and reissued to meet the requirements of SEPA.

Conclusion. Thank you for considering these comments. AFRC wants to work with DNR to get a new ten-year sustained yield harvest level adopted as soon as possible. But it is important to AFRC, as it is important to the trust beneficiaries, that the level that is adopted reflects sound forest management, and in fact reflects the highest sustained yield which the state trust lands can produce, consistent with DNR's obligations under its HCP, state law, and adopted policy.

The current DEIS does not provide a reasonable basis for moving forward. The agency must prepare a new DEIS with alternatives that comply with these duties.

Sincerely,

Travis Joseph
President