Vegetation Resources Inventory

Project Implementation Plan for Tree Farm Licence 23

Net Volume Adjustment Factor (NVAF) Sampling

Prepared for:

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Executive Summary

This Vegetation Resource Inventory (VRI) Project Implementation Plan (VPIP) for Net Volume Adjustment Factor (NVAF) sampling is based on the Vegetation Resource Inventory (VRI) Strategic Inventory Plan (VSIP) for TFL 23. It documents the NVAF sampling plan for TFL 23, including target population, sample sizes, stratification criteria, project schedule and costs. A description of the NVAF sample tree selection process, including the list of NVAF sample trees, will be provided as an addendum to this VPIP. The addendum is necessary since this VPIP has been prepared prior to the NVAF enhancement of the VRI samples.

The target population for NVAF sampling is the TFL Vegetated Treed Landbase ($\geq$ 30 year-old polygons), excluding the British Columbia Timber Sales (BCTS) area. Forty VRI sample clusters will be enhanced and remeasured for NVAF. These will be selected from the existing Vegetated Treed VRI sample polygons that fall in the target population, using systematic sampling from a sorted list (sorted by polygon leading species and maturity). The enhanced plots will be full VRI plots (excluding range). That is, timber attributes will be remeasured for the entire plot cluster, including the IPC (Integrated Plot Centre), and additional VRI attributes, including CWD (coarse woody debris), site series, succession, and ecology, will also be collected.

Trees from the enhanced VRI auxiliary plots will be grouped into dead and live trees. A total of 10 dead trees and 120 live trees will be selected systematically from a sorted list from each group, for destructive sampling. Of the live trees, 25 will be immature (from polygons $\leq$ 120 years old), 45 mature western hemlock (Hw) and 55 other mature species.

The plot enhancement and remeasurement will take place in May/June 2007, sample tree selection in July, destructive sampling in August/September and NVAF analysis and statistical adjustments in October-December. The total cost of all these NVAF and adjustment activities is approximately $251,000. The statistical adjustment of the existing updated Phase I database will support the timber supply analysis for the AAC determination in 2009.

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INTRODUCTION

This report outlines the Vegetation Resource Inventory (VRI) Project Implementation Plan (VPIP) for Net Volume Adjustment Factor (NVAF) sampling in TFL 23. It is based on the TFL 23 Vegetation Resource Inventory (VRI) Strategic Inventory Plan (VSIP). This VPIP documents the planned NVAF sampling activities for the TFL. These activities include the NVAF enhancement and remeasurement of the existing VRI plots, the tree destructive sampling (stem analysis), the derivation and application of the NVAF ratios, and the statistical adjustment of the updated existing Phase I database. It also provides details on the target population and the sample sizes and stratification criteria for the NVAF enhancement and the destructive sampling, and a list of the VRI plots to be enhanced. A glossary of VRI terms is provided in Appendix I.

The list of NVAF sample trees to be destructively sampled, including a description of the NVAF sample-tree selection process, will be provided as an addendum to this VPIP. This addendum is necessary since this VPIP has been prepared prior to the NVAF enhancement of the VRI samples.

This VPIP was prepared following discussions with the stakeholders (see Appendix II), and review of the following documents:

1. *VRI guidelines for preparing a project implementation plan for ground sampling and net volume adjustment factor sampling (March 2006).*
2. *Vegetation Resources Inventory Strategic Inventory Plan for Tree Farm Licence 23 (2007).*
3. *Net volume adjustment factor sampling standards and procedures* (version 4.1, March 2006).

A draft version of this VPIP has been reviewed by the stakeholders and their comments are incorporated into this final version.

LANDBASE

TFL 23 is located in the Arrow and Columbia Forest Districts in the southern interior of British Columbia, with a total land base of approximately 556,389 ha (Table 1).

Table 1. TFL 23 landbase

Land type	*Area (ha)*
Productive landbase	371,834
THLB	224,702
Other	147132
Non-productive landbase	184,555
Total TFL landbase	***556,389***

Approximately 67% of the TFL area is productive forest and the remainder is non-productive (alpine areas, non-productive brush, rock, rivers, lakes and swamp. The timber harvesting landbase is approximately 40% of the total TFL landbase. Approximately 28% (50,000 ha - 60,000 ha) of this THLB will be taken back for the British Columbia Timber Sales (BCTS) program. The TFL lies in the ICH, IDF and ESSF biogeoclimatic zones. The main tree species are Douglas-fir (Fd), western hemlock (Hw), Engelmann spruce, white spruce (Sw), lodgepole pine (Pl), sub-alpine fir (B), western larch (L) and western redcedar (Cw).

NVAF SAMPLING PLAN

OBJECTIVE

The purpose of NVAF sampling is to provide factors to adjust net tree volume, which is obtained from net factoring and taper equations, for the 289 VRI samples established in TFL 23 in 1999 and 2000. The 1999 samples were in stands 10-80 years old, and the 2000 samples were in stands greater than 80 years old. The NVAF is required to complete the TFL VRI ground sampling and statistical adjustment. The adjustment accounts for hidden decay and possible taper equation bias.

TARGET POPULATION

The target population for NVAF sampling is the Vegetated Treed (polygons $\geq$ 30 years old) landbase, excluding the BCTS area. The BCTS area is excluded because Pope & Talbot has requested the MOFR to delete this area from the TFL landbase. Thus, as explained in the TFL 23 VSIP, the BCTS area and the remaining TFL area should be treated as separate units. If the two units are combined during NVAF sampling and statistical adjustment, and the BCTS area is then removed after the adjustment, the attributes of the remaining TFL landbase would no longer be unbiased. To remove the bias, the NVAF samples would have to be recompiled, and the statistical adjustment made, separately for each unit. Stands younger than 30 years old are excluded because, according to current MOFR FAIB statistical adjustment practice, only stands at least 30 years old are adjusted.

SAMPLE SIZES & STRATA

VRI sample plots to enhance

The polygons in which the 289 VRI ground samples were established in 1999/2000 were screened to exclude those that fell outside the NVAF target population. That is, all polygons that were in the BCTS area, were younger than 30 years old, or were logged or burned, were excluded. The remaining 165 VRI sample polygons were divided into two lists: one for the 112 immature polygons ($\leq$ 120 years old) and the other for the 53 mature polygons.

Each list was then sorted by polygon leading species and age. A sub-sample of 7 VRI sample polygons was selected systematically from the immature list, and 33 from the mature list, for a total of 40 VRI sample polygons. The sample sizes of 7 immature polygons and 33 mature polygons are based on the rule-of-thumb that the number of VRI plots to enhance (sample polygons) is equal to the number of target total live sample trees (20 and 100, respectively) divided by three. The list of the VRI samples and polygons to be enhanced is provided in Appendix III.

Sample trees for destructive sampling

Trees from the enhanced NVAF VRI plots will be stratified into live and dead (Table 2).

Table 2.Total number of NVAF sample trees by strata for TFL 23

Stratum	Number of NVAF sample trees
Dead trees	10
Live trees	120
Immature (stand ≤ 120 yrs old)	20
Mature (stand > 120 yrs old)	100
Western hemlock	45
Other species	55
Total	*130*

A total of 10 dead trees and 120 live trees will be selected systematically from a sorted list from each stratum for destructive sampling. These strata tree lists will be sorted by tree dhb. The live trees are stratified further: 25 will be immature, 45 mature western hemlock, and 55 other mature species. The immature and mature strata are further stratified by species. Thus, the tree strata (matrix cells) are: dead (all species combined), live immature (≤ 120 years old) by species, and live mature by species. An approximate distribution of live sample trees by these strata is given in Table 3.

Table 3. Distribution of live NVAF sample trees by strata for 2007 sampling for TFL 23 (Source: MOFR FAIB)

Maturity class	*Number of live sample trees by species*																
	Ac	*At*	*B*	*Cw*	*Ep*	*F*	*Hw*	*Lw*	*Pl*	*Pw*	*Py*	*S*	*Tw*	*Xc*	*Yc*	*D*	*Pa*
Immature	0	0	2	3	0	4	2	1	5	1	0	2	0	0	-	-	-
Mature	0	0	9	16	1	12	45	3	3	1	0	10	-	0	0	0	0

Allocation of live sample trees to the strata in Table 3 is proportional to relative species volume in the VRI plots, except for mature western hemlock. More mature western hemlock trees are sampled to permit a more precise assessment of the accuracy of the taper equations and loss factors of this species.

The NVAF sample trees will be selected after the VRI plot enhancement. The list of NVAF sample trees to be destructively sampled, including a description of the NVAF sample-tree selection process, will be provided as an addendum to this VPIP (see Appendix IV).

MEASUREMENT PROCEDURES & ANALYSIS

NVAF enhancement and remeasurement

The NVAF enhancement will involve the tallying and enhancement of dead trees, the enhancement of the live trees, and the updating of sample location access and stand conditions. During the enhancement, timber attributes will be remeasured for the entire plot cluster, including the IPC (Integrated Plot Centre). As well additional VRI attributes, including coarse woody debris (CWD), site series, succession, and ecology, will be collected. That is, the enhanced plots will be full VRI plots (excluding range). These additional data would be entered into TFL database, to be used support habitat mapping and other sustainable forest management initiatives. The enhancement and remeasurement will follow the MOFR standards for NVAF sampling and VRI ground sampling.

Re-compilation of VRI samples

The timber attributes from the original VRI samples will be re-compiled and updated to 2007, to account for the 6-year age difference in the attribute values between the initial measurement date (1999/2000) and the enhancement date (2007). The ratio of the timber attribute stand value (e.g., volume/ha) in 2007 to the attribute stand value in 1999/2000 will be calculated using the enhanced VRI sample data. Then, all the non-enhanced plots within the NVAF target population will be updated by multiplying the original attribute stand value by this ratio. Once the data are available, this update process will be discussed further with the MOFR FAIB prior to its implementation.

Tree destructive sampling

Complete destructive (stem) analysis of the sample trees will be done following the MOFR standards for NVAF sampling. The stem analysis data will be analyzed to develop net volume adjustment factors, and to determine the accuracy of merchantable volume and taper equations for western hemlock.

NVAF analysis and statistical adjustment

The data from the destructive sampling will be analyzed to calculate actual net volume, and the NVAF – the ratio between actual net volume and the estimated (cruiser) net volume. The NVAF ratios will be calculated by strata, and will be used to adjust the updated VRI ground sample data. The new net volume for the VRI plots is obtained as the product of the updated estimated net volume and the NVAF ratio. The NVAF analysis will use the methods approved by the MOFR.

The existing Phase I database will then be adjusted by strata using all the updated VRI sample data. The purpose of this adjustment is to adjust the photo-interpreted attribute estimates to obtain unbiased overall and strata averages and totals for the TFL. The adjustment strata will be determined after examining the updated VRI data, and the previous analyses done by Sterling Wood Group in 2000. The stratification criteria shall include biogeoclimatic classification, leading species, age, similarity of attribute ratios, and number of available samples. The derived adjustment strata ratios and their impact on the TFL inventory database shall be discussed with the MOFR. The statistical adjustment will use the methods approved by the MOFR.

Analysis of western hemlock decay and taper errors

As discussed in the TFL 23 VSIP, past anecdotal evidence from cruise and scale comparisons appears to suggest that sound wood is over-estimated in western hemlock stands. To verify these observations, the NVAF western hemlock data will be analyzed to detect error trends in the decay estimates and taper equations. It is also for this reason that priority has been given to completing NVAF sampling ahead of a new Phase I. Methods for conducting this non-standard VRI analysis will be developed by Pope & Talbot in consultation with the MOFR.

NVAF PROJECT IMPLEMENTATION PLAN

SCHEDULE

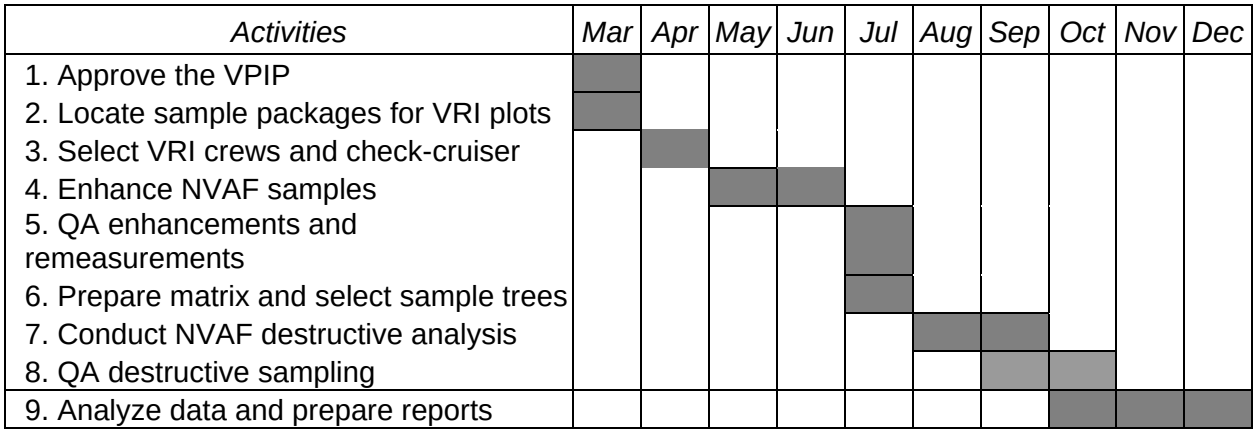
The proposed work schedule is as follows (Figure 1):

1. Submit the VPIP for approval by the MOFR (February/March, 2007) (Pope &Talbot Ltd.).
2. Identify and prepare sample packages for the selected 40 polygons for NVAF enhancement (Pope &Talbot Ltd).
3. Tender and select contract enhancement field crews and independent Check-Cruiser (April) (Pope &Talbot Ltd.).
4. Locate and measure timber attributes in the VRI sample clusters in the selected polygons; and enter and validate data (May - June) (certified contract crew).

5. Conduct quality assurance (4 plots) of the enhanced plots (July) (Independent Check-cruiser).
6. Prepare tree sampling matrix and select sample trees (July) (Contractor).
7. Conduct NVAF destructive sampling and sampling of ecology attributes (August-September) (NVAF Contractor and certified ecologist). The regional or local ecologist will be consulted to determine if the ecology sampling can be done at the same time as that for the timber attributes in April-June.
8. Conduct QA of destructive sampling (September-October) (Contractor).
9. Complete all NVAF data analysis; adjust the existing updated Phase I inventory; complete the western hemlock decay/taper analysis; and prepare inventory summary reports (October-December) (Contractor).

Figure 1. NVAF sampling implementation schedule for TFL 23 in 2007.

2007 Field Season



PLOT REMEASUREMENT AND ENHANCEMENT

Sample Packages

The original VRI sample packages are not available; they were not provided by the now defunct Sterling Wood Group who installed the VRI plots. Pope & Talbot will re-create and provide to the contract crew as much information as is available in the VRI database, including maps and plot access notes.

Fieldwork

Fieldwork will be completed using certified timber and ecology crews. The field work will be completed according to the MOFR NVAF sampling and VRI ground sampling procedures. Field supplies such as aluminum stakes, field maps, photos, field cards, and equipment (including global positioning system [GPS] and

helicopter time) will be provided by the contract field crews. Each contract crew will enter their own plot data and provide validated data, including updated access notes, to the project manager. A qualified third party will complete the Quality Assurance of four VRI plots.

NVAF DESTRUCTIVE SAMPLING AND ANALYSIS

Sample Packages

Pope & Talbot will provide to the contract crew the enhanced VRI sample packages, maps, and plot access notes.

Fieldwork

A contract crew, separate from the enhancement crew, will complete the destructive sampling. Field supplies such as field cards, and equipment (including GPS and helicopter time) will be provided by the contract field crews The NVAF sampling will be completed to current NVAF sampling standards and procedures. A third party will be responsible for QA of the field work.

NVAF Analysis and Adjustment

Pope & Talbot will contract out the compilation and verification of the data, and completion of the NVAF analysis and existing database statistical adjustment. The analysis and adjustment will in general follow the procedures recommended by the MOFR.

Analysis of western hemlock decay/taper errors

Pope & Talbot will contract out the analysis of the western hemlock NVAF data to detect error trends in decay and taper estimates. The analysis methods will be discussed with the MOFR prior to implementation.

ROLES AND RESPONSIBILITIES

The *MOFR* shall be requested to:

1. Approve this NVAF VPIP.
2. Mentor NVAF crews and conduct NVAF QA, as required.

Pope & Talbot's *Project Coordinator* will:

1. Coordinate the project and liaise with the MOFR.
2. Ensure the VPIP is followed, and all contractors are qualified and certified.
3. Manage fieldwork contracts and monitor the project budget.
4. Ensure the sample packages are assembled and complete.
5. Ensure QA for enhancement and destructive sampling is complete.

6. Ensure completion of NVAF analysis, VRI statistical adjustment and analysis of western hemlock decay/taper.

ESTIMATED COSTS

The estimated total cost of the NVAF sampling project is $251,000. The cost breakdown is given in Tables 4.

Table 4. Estimated total costs for the NVAF sampling and adjustment in TFL 23 in 2007.

Operational Activity	*Units*	*Unit Cost*	*Total*
NVAF			
Enhancement	40 clusters	$2,250/cluster	$90,000
QA VRI enhancement & measurement			$9,000
Sample tree selection		$3,000	$3,000
Destructive sampling	140 trees	$600/tree	$84,000
QA destructive sampling			$5,000
Helicopter costs			$30,000
NVAF analysis & statistical adjustment			$25,000
Analysis of western hemlock decay/taper			$5,000
Total			***$251,000***

APPROVAL/SIGNING

I have read and concur with the VPIP for NVAF sampling in TFL 23, dated 6 March, 2007. It is understood that this is an agreement-in-principle and does not commit the signatories to completing the inventory activities outlined within the plan. Modifications to this plan or more detailed plans need to be reviewed and approved by the signatories.

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APPENDIX I: GLOSSARY OF TERMS

Ground Sampling

Ground sampling is the field measurement of timber, ecology, range, and/or coarse woody debris values at one or more locations within each sample polygon. The sample polygons are selected proportional to their area from a sorted list. To accommodate the wide variety of resources, various types and sizes of sampling units (e.g., fixed and variable plots, transects) are used to make the measurements.

Inventory Unit

An inventory unit is the target population from which the samples are chosen. For the provincial VRI, the inventory unit is the Forest District or TFL, which includes the timber harvesting landbase, parks, recreational areas, private, and federal lands. For management inventories, the inventory unit is a subset of the provincial VRI inventory unit that focuses on a geographic area or specific attribute set, depending upon the sampling objectives.

Landcover Classification

The BC Landcover Classification Scheme (BCLCS) was designed specifically to meet the requirements of the VRI, in addition to providing general information useful for “global vegetation accounting” and “integrated resource management.” The BCLCS is hierarchical and reflects the current state of the landcover (e.g., presence or absence of vegetation, type and density of vegetation) and such fixed characteristics as landscape position (i.e., wetland, upland, alpine). There are two main classes of polygons: Vegetated and Non-Vegetated.

Management VRI

Management VRIs are specialized inventories that provide the detailed information required for specific resource management, i.e., day-to-day forest management. One or more VRI sampling procedures may be used for management inventories. Management inventories may focus on specific resource types (timber, range, ecology), geographic areas (e.g., landscape unit, TFL), attribute sets (e.g., Douglas-fir leading stands, age class 4+). They may use one or more of the following tools (e.g., photo-interpreted estimates, ground sampling, NVAF sampling).

National Forest Inventory (NFI)

The NFI provides information on Canada’s resources across all provinces and allows the Federal Government a consistent framework for reporting on Canada's inventory. The inventory unit for the NFI is the entire country, although it is implemented province-by-province.

Net Volume Adjustment Factor (NVAF) Sampling

NVAF sampling provides factors to adjust net tree volume, which is estimated from net factoring and taper equations. The adjustment accounts for hidden decay and possible taper equation bias. NVAF sampling involves detailed stem analysis of sample trees, calculation of actual net volume, and calculation of the ratio between actual net volume and estimated net volume.

Photo-Interpreted Estimates
Photo-interpreted estimates inventory involves the subjective delineation of polygons and the photo estimation of attributes for all polygons in an inventory unit.

Post-Stratification
Post-stratification involves the division of an inventory unit into mutually exclusive sub-populations (strata) *after* ground sampling has been completed. Samples that fall in each post-stratum are analyzed separately and the results are applied to the corresponding population post-strata to improve the precision of the inventory's overall averages and totals.

Pre-Stratification
Pre-stratification involves the division of an inventory unit into mutually exclusive sub-populations (strata) *before* ground sampling to provide estimates for specific areas, or to increase the confidence in the overall estimates by considering the special characteristics of each stratum.

Provincial VRI
The provincial VRI provides baseline data for provincial inventory reporting, monitoring, and research. All of the sampling procedures from the VRI toolbox are used for this inventory at the Forest District level. The databases generated from each District inventory will be compiled to create the provincial VRI database. The provincial VRI has also been referred to in the past as the District VRI.

Resource-Specific Interpretations
Resource-Specific Interpretations (RSI) use the RIC standard VRI baseline data products (provincial VRI or management inventory), in combination with other data sets and analysis (outside of that required to produce VRI), to produce information to address specific-resource management issues (e.g., TSR review, important ecosystems, important habitats). These interpretations include ecosystem interpretations and habitat interpretations.

Sample Size
The sample size for an inventory is the minimum number of ground samples to be established in an inventory unit to meet the target precision.

Statistical Analysis (Adjustment)
Statistical analysis is the process of adjusting the values of the photo-interpreted estimates variables using the ground sampling observations. For each sampled polygon, the ground observations are compared to the photo-estimated values to develop an adjustment factor. This factor is then applied to all polygons in the photo-interpreted estimates database to produce the final adjusted database.

Sub-unit
The term sub-unit describes the inventory unit of a management inventory (i.e., the management inventory target population is a subset of the provincial VRI inventory unit). A sub-unit may be defined by a specific geographic area (e.g.,

operable landbase) or stand type (e.g., problem forest types) within the Forest District.

Target Precision
Target precision expresses the amount of variation in key attributes (e.g., timber volume) desired in the final results. The target precision, usually expressed as the coefficient of variation (CV), is used to calculate the minimum sample size for subsequent ground sampling.

Vegetation Resources Inventory (VRI)
The VRI is an improved vegetation inventory process for assessing the quantity and quality of BC's vegetation resources. The VRI process is designed to include a flexible set of sampling procedures for collecting vegetation resource information. The VRI is essentially a toolbox of procedures, which include:

- *Photo-interpreted estimates*: the delineation of polygons from aerial photography and the estimation of resource attributes.
- *Ground sampling*: the establishment of plot clusters in selected polygons to measure timber, ecological, and/or range attributes.
- *NVAF Sampling*: Stem analysis sampling of individual trees for net volume adjustment.
- *Statistical Adjustment*: the adjustment of the photo-interpreted estimates for all polygons in an inventory unit or management unit using the values measured during ground sampling.

The VRI can be deployed over the entire province (provincial VRI) measuring timber and non-timber resources, or over a large management unit (management VRI) measuring selected resources in specific portions of the landbase. The VRI sampling process produces spatial and non-spatial databases that can be used in multiple resource management applications including timber, ecosystem, and wildlife habitat management.

APPENDIX II: STAKEHOLDERS AND CONTACTS

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APPENDIX III: VRI SAMPLES TO BE ENHANCED FOR NVAF SAMPLING

The list of the 40 VRI sample polygons to be enhanced and remeasured for NVAF is given in Table 5. There are 33 mature polygons (> 120 years old) and 7 immature.

Table 5. List of VRI samples to be enhanced and remeasured in TFL 23.

MAPSTAND	PROJ_ID	SAMP_NO	POLY_ID	CLSTR_ID	SPEC_1_TFL	PRJAGE	AGE-CLASS
082E080 493	3232	0134	082E080 493	3232-0134-QM1	B	135	MAT
082L029 44	3232	0097	082L029 44	3232-0097-QO1	B	215	MAT
082K073 333	3232	0077	082K073 333	3232-0077-QO1	B	228	MAT
082K042 217	3232	0051	082K042 217	3232-0051-QO1	B	228	MAT
082K042 721	3232	0129	082K042 721	3232-0129-QM1	B	228	MAT
082L030 249	3232	0098	082L030 249	3232-0098-QO1	B	228	MAT
082K011 200	3232	0035	082K011 200	3232-0035-QO1	B	228	MAT
082K062 723	3232	0066	082K062 723	3232-0066-QO1	CW	138	MAT
082L010 389	3232	0091	082L010 389	3232-0091-QO1	CW	148	MAT
082N003 32	3232	0119	082N003 32	3232-0119-QO1	CW	228	MAT
082K082 245	3232	0080	082K082 245	3232-0080-QO1	CW	228	MAT
082L030 322	3232	0100	082L030 322	3232-0100-QO1	FD	125	MAT
082F041 21	3232	0123	082F041 21	3232-0123-QM1	FD	135	MAT
082F091 265	3232	0025	082F091 265	3232-0025-QO1	FD	145	MAT
082E050 211	3232	0003	082E050 211	3232-0003-QO1	FD	190	MAT
082E049 105	3232	0001	082E049 105	3232-0001-QO1	H	171	MAT
082K021 224	3232	0038	082K021 224	3232-0038-QO1	HW	130	MAT
082K062 638	3232	0065	082K062 638	3232-0065-QO1	HW	158	MAT
082K051 312	3232	0056	082K051 312	3232-0056-QO1	HW	215	MAT
082E069 22	3232	0008	082E069 22	3232-0008-QO1	HW	215	MAT
082K083 135	3232	0082	082K083 135	3232-0082-QO1	HW	228	MAT
082K061 119	3232	0063	082K061 119	3232-0063-QO1	HW	228	MAT
082K041 308	3232	0046	082K041 308	3232-0046-QO1	HW	228	MAT
082K072 411	3232	0075	082K072 411	3232-0075-QO1	HW	228	MAT
082K072 245	3232	0074	082K072 245	3232-0074-QO1	HW	328	MAT
082K041 487	3232	0049	82K041 487	3232-0049-QO1	HW	328	MAT
082K051 534	3232	0058	082K051 534	3232-0058-QO1	L	228	MAT
082F041 12	3232	0019	082F041 12	3232-0019-QO1	S	215	MAT
082N003 185	3232	0130	082N003 185	3232-0130-QM1	S	228	MAT
082K073 110	3232	0076	082K073 110	3232-0076-QO1	S	228	MAT
082K073 444	3232	0078	082K073 444	3232-0078-QO1	S	228	MAT
082L039 209	3232	0102	082L039 209	3232-0102-QO1	S	228	MAT
082L039 252	3232	0103	082L039 252	3232-0103-QO1	S	228	MAT
082K062 346	3231	0120	082K062 346	3231-0129-QO1	B	65	IMM
082E090 73	3231	0052	082E090 73	3231-0042-QO1	FD	39	IMM
082K051 224	3232	0055	082K051 224	3232-0055-QO1	FD	88	IMM
082L010 622	3231	0158	082L010 622	3231-0177-QO1	HW	34	IMM
082K021 120	3231	0090	082K021 120	3231-0058-QO1	L	38	IMM
082E090 205	3231	0055	082E090 205	3231-0085-QO1	PL	63	IMM
082E070 387	3231	0040	082E070 387	3231-0139-QO1	PL	75	IMM

All the variable names in Table 5 (except AGE-CLASS) are those in the inventory database. That is, MAPSTAND is map number, PROJ ID is the VRI project code, SAMP NO is the VRI sample number, POLY ID is the polygon identification, CLUSTER ID is the VRI plot identification, SPEC 1 TFL is the polygon leading tree species, PRJAGE is projected age to end of 2005 (the most recent forest cover update), and AGE-CLASS is maturity class where IMM is immature polygons ($\leq$ 120 years old) and MAT is mature polygons.

APPENDIX IV: LIST OF NVAF SAMPLE TREES IN TFL 23

This appendix that provides a list of the NVAF sample trees will be included in this VPIP as an addendum. The NVAF sample tree selection addendum shall provide at least the following information:

- a description of the process used to determine the proportional sample sizes by species,
- a table that shows the proportions by species in the population,
- A description of the sample selection process used to select the sample trees.