# KINGCOME TIMBER SUPPLY AREA
# TSR 3 DATA PACKAGE

**Prepared for:**

**Kingcome TSA Licensee-Agency Group**

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Attention: Ian Robertson, RPF
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***Reference:*** *Kingcome TSA TSR 3 Data Package*

Attached please find the Data Package report as part of the Kingcome TSA TSR 3 process. This report outlines the inputs and assumptions that will be used in the timber supply analysis for the TSA. Revisions have been made based on feedback from members of the Licensee Group and MoFR.

Thank you for your input and assistance during the preparation of the Data Package.

Yours truly,
TIMBERLINE NATURAL RESOURCE GROUP LTD.

Erik Wang, RPF
Senior Resource Analyst

# EXECUTIVE SUMMARY

A timber supply review process has been initiated for the Kingcome Timber Supply Area (TSA). These reviews are conducted every five years and assist the B.C. Forest Service's Chief Forester in re-determining allowable annual cuts (AACs). For the Kingcome Timber Supply Area the Chief Forester will determine a new AAC by August 2008. Timberline Natural Resource Group Ltd., on behalf of the Kingcome TSA Licensee-Agency Group, is preparing timber supply information for the analysis.

The allowable annual cut (AAC) for the Kingcome TSA was set in 1996 at 1,399,000 m³, which equated to a 22 percent reduction from the previous AAC. In July 2002, the Chief Forester temporarily reduced the AAC under section 173 in Part 13 of the *Forest Act*, to 1,355,000 m³. This reduction was done to account for the Central Coast Designated Area. On October 1, 2002, the Chief Forester determined the AAC under section 8 of the *Forest Act* to be 1,284,000 m³, a reduction of 8 percent from the previous AAC. This included a 20,340 m³ partition for deciduous-leading stands. The July 2002 temporary reduction of 44 000 m³, also applied to the October 2002 determination and remained in place until June 2004. In September 2006, the Chief Forester made a new determination under Section 173 of the *Forest Act* that reduced the AAC by 52,000 $m^3$ to 1,232,000 $m^3$. This reduction did not affect the deciduous partition and remains in effect until the area referred to as the Central Coast Designated Area No. 2 ceases to be a designated area in May 23, 2010. It is expected that either the area will be re-established as a Designated Area or it will have achieved full provincial park status by that date.

On July 27, 2007, the Ministry of Agriculture and Lands issued a legally binding Ministerial Order (MO) called the South Central Coast Order. The legal order requires forest licensees to implement Ecosystem Based Management (EBM) in the southern portion of the Central Coast Land and Resource Management Plan (CCLRMP) area.

This *Kingcome TSA Data Package* is provided to the public and First Nations for review prior to initiation of the analysis to support allowable cut determination for Timber Supply Review (TSR) 3. Although it is a technical document for a technical audience, every effort has been made to ensure that it is self-explanatory.

The Data Package allows the reader to consider the inputs and assumptions that will be used in the timber supply analysis. These include:

- Documentation of inventory data and sources;
- Classification of the land base according to each hectare's contribution to management (harvest, resource management for wildlife, *etc).*;
- Land productivity estimates and prediction of stand growth and timber yield;
- Silviculture and harvesting regimes;
- Action taken to model multi-resource requirements;
- Modelling structures to address the Central Coast Land and Resource Management Plan (CCLRMP); and
- Timber supply scenarios and sensitivities to be investigated.

The TSR process is designed to capture "current practice" on a management unit. However, during the period in which EBM parameters are being established and implemented, current practice is in fact in a stage of transition. To capture this dynamic, two scenarios will be explored.

- Pre-EBM - This scenario will capture current Forest and Range Practices Act (FRPA) management practices and assumptions.
- EBM Ministerial Order – This will capture the objectives as defined in the final South Central Coast Order, which has now been legally established.

The public and First Nations review processes have been completed, and this document has been finalized. It will be published as an appendix to the Timber Supply Analysis Report. There will be another public review opportunity at that time.

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# 1.0 INTRODUCTION

Timberline Natural Resource Group Ltd. (Timberline), on behalf of the Kingcome Timber Supply Area (TSA) Licensee-Agency Group (the Group) is preparing timber supply information for the Provincial timber supply review. The Group is composed of forest companies and British Columbia Timber Sales (BCTS) with some participation by First Nations and the Ministry of Forests and Range (MoFR). It was originally formed under the Defined Forest Area Management (DFAM) concept, developed by the MoFR as a policy framework to identify the obligations and opportunities for collaborative forest management within the province's TSAs. While the DFAM concept has since been terminated by the Chief Forester, the Group continues to exist and will assume collective responsibility for timber supply analysis within the TSA.

Timber supply reviews are conducted every five years to assist the B.C. Forest Service's Chief Forester in re-determining the allowable annual cut (AAC). For the Kingcome Timber Supply Area (TSA), the Chief Forester will determine a new AAC by August 2008.

Timberline will complete the steps leading up to, and including the delivery of, timber supply analyses as follows:

- Collecting data and preparation of a Data Package which summarizes the data assumptions—land base, growth and yield, forest management practices, statement of management strategies, and analysis methods—that will be used, and the critical issues that will be examined in the timber supply analysis;
- Completing the timber supply analysis and report; and
- Providing the necessary information for public and First Nations reviews.

Upon acceptance by the British Columbia MoFR Forest Analysis and Inventory Branch, the assumptions and methodology provided in the Data Package will be used by the Group to prepare and submit a timber supply analysis to the MoFR. These results will be presented in a Timber Supply Analysis Report. First Nations and the public will have an opportunity to review and comment on the timber supply analysis report that has been accepted by the Chief Forester. Finally, the Chief Forester will consider the Timber Supply Analysis Report and other sources of information in order to make a new AAC determination. All results will be presented to the Chief Forester of British Columbia for the determination. This determination will be published in a report entitled '*Kingcome Timber Supply Area – Rationale for AAC Determination*'.

## 1.1 Purpose

The purpose of the Data Package is to provide information on the forest resource inventory and the practices within the timber supply area (TSA) that will be compiled for the purposes of conducting a timber supply analysis. It includes descriptions of information sources, assumptions, issues, and any relevant data processing or adjustments related to the land base, growth and yield, and management objectives and practices.

The following principles and standards will apply to the data sources and Data Package (MoFR, 2003a):

- The Data Package must describe, and where appropriate summarize, all data and information to be used in the timber supply analysis;
- The Data Package must contain descriptions of how current forest management, or reasonable extrapolations of current management will be modelled;

- The most current and best available data must be used;
- More detailed discussion should be provided in the package for data for which there is a high degree of uncertainty;
- The Data Package must contain a summary of plans for examining the potential impacts of important uncertainties in information (*i.e.*, planned sensitivity analysis);
- The evidentiary basis for information used in analyses must be available on request, and to the extent possible be included in the Data Package. Evidence could include the following:
    - A description of data sources;
    - A description of sampling and data analysis methods or standards;
    - Digital or analog maps of the land base (*e.g.*, forest cover, ownership, habitat areas);
    - Results of any reviews or audits of source information or inventories; and
    - Any acceptances by appropriate professionals (*e.g.*, terrain stability mapping).
- When collecting or analyzing data to include in the Data Package, existing standards should be followed, unless justification is provided for diverging from standards. Such justification should demonstrate that although standards were not followed, the information is the best available that could be obtained for the timber supply review;
- Where possible, the implications to the timber supply analysis (*e.g.*, increased uncertainty) of diverging from the standards should be examined and reported; and
- The choice of a particular timber supply model is at the discretion of MoFR.

## 1.2 Background

The AAC for the Kingcome TSA was set in 1996 at 1,399,000 m³, which equated to a 22 percent reduction from the previous AAC. In July 2002 the Chief Forester temporarily reduced the AAC under Section 173 in Part 13 of the *Forest Act*, to 1,355,000 m³. This reduction was done to account for the Central Coast Designated Area. On October 1, 2002, the Chief Forester determined the AAC under section 8 of the *Forest Act* to be 1,284,000 m³, a reduction of 8 percent from the previous AAC. This included a 20,340 m³ partition for deciduous-leading stands. The July 2002 temporary reduction of 44,000 m³, also applied to the October 2002 determination and remained in place until June 2004. In September 2006, the Chief Forester made a new determination under Section 173 of the *Forest Act* that reduced the AAC by 52,000 $m^3$ to 1,232,000 $m^3$. This reduction did not affect the deciduous partition and remains in effect until the area referred to as the Central Coast Designated Area No. 2 ceases to be a designated area in May 23, 2010. It is expected that either the area will be re-established as a Designated Area or it will have achieved full provincial park status by that date.

On July 27, 2007, the Ministry of Agriculture and Lands issued a legally binding Ministerial Order (MO) called the South Central Coast Order (Ministry of Agriculture and Lands, 2007). This legally established order requires forest licensees to implement Ecosystem Based Management (EBM) in the southern portion of the Central Coast Land and Resource Management Plan (CCLRMP) area. This includes the mainland portion of the Kingcome TSA.

## 1.3 Processes, Roles and Responsibilities

This Kingcome TSA Data Package fits within a continuum of processes progressing towards the determination of the AAC for the Kingcome TSA. The Data Package outlines the steps to be

followed from collection of existing information through to completion of the Timber Supply Analysis Reports.

MoFR staff plays a key role in reviewing and accepting both the Data Package and the subsequent timber supply analysis. They have provided technical support, facilitated resolution of issues, and validated technical information. The following summary shows the general roles and responsibilities associated with the timber supply analysis leading to an AAC determination.

| Licensee-Agency Group Obligations | Government Obligations |
|---|---|
| Collect and prepare a Data Package based on the best available information | Set standards for the Data Package<br>Review and accept the Data Package |
| Complete an analysis for the Kingcome TSA | Set standards for the analysis<br>Review and accept the analysis |
| Provide information to the public and First Nations | Consult with First Nations<br>Determine the AAC for the Kingcome TSA |

When completed, this document will be published as an appendix to the Timber Supply Analysis Report. For further information about the Data Package and timber supply analysis for the Kingcome TSA, please contact:

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## 1.4 Timber Supply Review

The preparation of the Data Package is the first step in the TSR process. The Data Package must go through two revision processes before it is accepted for use. MoFR must review and accept the first draft of the Data Package. It must also be made available for a public and First Nations review. Feedback from this review process must be documented along with records of how comments were incorporated into the revision of the Data Package. After the first revision, the Data Package is then submitted for a second review by the MoFR, public and First Nations. After this review and accompanying revision, the Data Package can be accepted for use in the TSR.

Once the Data Package has achieved approval for use, the timber supply analyses can be performed following all of the criteria outlined in the Data Package. The results of these analyses are documented in the analysis report. This report is then submitted to the Chief Forester for

consideration as part of the TSR process. The timber supply analysis report will also be made available for review and comment by First Nations and the public.

To facilitate the Data Package review process, a web site dedicated to the TSR 3 analyses was established at <http://www.timberline.ca/kingcome/index.html>. The draft Data Package and background documents will be placed on this site. This provides individuals with the opportunity to download these materials for review.

## 1.5 Forest and Range Practices Act

The Forest Practices Code (FPC) was introduced in 1995. The Forest and Range Practices) came into force January 31, 2004 and for the most part, replaced the FPC by December 31, 2005. This move from the FPC to the FRPA represents a transition from a primarily plan and process-based regime under FPC to a results-based regime under FRPA. Prior to December 31, 2005 there was a transition period where licensees worked under either a Forest Development Plan (as per FPC) or a Forest Stewardship Plan (as per FRPA).

Under FRPA, FPC guidelines will no longer be within the legal framework but will move to the non-legal realm. To meet the objectives set by government either through land use, regulation, or enabled by regulation, greater emphasis will be placed upon professional reliance in the preparation of operational plans to ensure such objectives will be met. The licensee may propose results and strategies in their operational plan (i.e., Forest Stewardship Plan) or in some cases may select default results and strategies identified in the Forest Planning and Practices Regulation (FPPR).

## 1.6 Central Coast Land and Resource Management Plan Process

The July, 2007 South Central Coast Order regarding the CCLRMP defines land use objectives and other measures to implement ecosystem based management within the South and Central Coast area. A copy of the order and a map outlining the areas where the objectives will be applied is available at:

http://www.mediaroom.gov.bc.ca/DisplayEventDetails.aspx?eventId=389

There are two key components that will be recognized when addressing the CCLRMP, specifically:

- Protection of new Conservancy areas and Biodiversity areas; and
- Ecosystem-Based Management (EBM) objectives and targets.

## 1.7 Timber Supply Scenarios

The TSR process is designed to capture "current practice" on a management unit. However, during the period in which EBM parameters are being established and implemented, current practice is in fact in a stage of transition. To capture this dynamic, two scenarios will be explored.

Pre-EBM - This scenario will capture current Forest and Range Practices Act (FRPA) management practices and assumptions.

EBM Ministerial Order – This scenario will capture the objectives as defined in the now legally established South Central Order.

# 2.0 INVENTORY AND GENERATE DATA

## 2.1 Data Sources

The sources of data compiled for input into the TSR 3 timber supply analyses are documented in Table 1. The use of these data sources is noted in the following sections describing land base and management assumptions. Details about the data source are available from the data source contacts. Further information specific to each inventory category will be made available with the final Data Package included with the Timber Supply Analysis Report. The use of each data component in also indicated in Table 1. The table also indicates whether the data was employed only in the **Pre** EBM scenario or as an additional component in the **EBM** scenario.

There are three major new or updated sources of data that were not included in the previous timber supply review. These data are the recently completed Vegetation Resource Inventory (VRI), CCLRMP land use zones and EBM boundaries.

**Table 1 – Data sources**

| Inventory Category | Coverage Name | Source Agency[2] | Date of Compilation or Update | Analysis Use[1] | | |
|---|---|---|---|---|---|---|
| | | | | Net | Res | Zone |
| TSA Boundary | Tsa_bnd | ILMB | 2006 | Pre | | |
| Protected Areas | Prot_areas | ILMB | 2006 | Pre | | |
| Ownership TSR 2 | Own | MoFR | 2000 | Pre | | |
| Vegetation Res Inventory | VRI | MoFR | 2004 | Pre | Pre | |
| Addition Forest Cover | For_t0405 | MoFR | 2006 | Pre | Pre | |
| Old Growth Management Area | Ogma | ILMB | 2006 | Pre | | |
| Woodlots | Woodlots | MoFR | 2006 | Pre | | |
| Karst Potential LRDW | Karstpot | ILMB | 2002 | Pre | | |
| Timber Licences | Tls | MoFR | 2006 | Pre | Pre | |
| Operability | Oper_rw8 | TNRG Vancouver | 2006 | Pre | | |
| Recreation | Rec_ften/rec | ILMB | 2006 | Pre | Pre | |
| Riparian Management Area | Rma | TRIM/TFIC | 2006 | Pre | | |
| Road Buffer | Road_20mbuf | TRIM/TFIC | 2006 | Pre | | |
| Wildife Habitat Area | Wha | ILMB | 2006 | Pre | | |
| Archaeology | Arch_buf | TNRG Vic | 2006 | Pre | | |
| ESA 1 | Esa_1 | MoFR | 1978 | Pre | Pre | |
| ESA 2 | Esa_2 | MoFR | 1978 | Pre | Pre | |
| Ungulate Winter Range | Uwr | MOE | 2006 | | Pre | Pre |
| Protection and Biodiversity | tg2g_14 | ILMB | 2007 | Pre | Pre | |
| Logged Blocks | Tsa33_log | MoFR | 2007 | Pre | Pre | |
| BEC | Bec | MoFR | 2006 | | Pre | Pre |
| Community Watersheds | Com_watsh | ILMB | 2006 | | Pre | Pre |
| Visual Landscape Inventory | Dmpvli | MoFR | 2006 | | Pre | Pre |
| Landscape Units | Lu | ILMB | 2006 | | Pre | Pre |
| Scenic Areas | Sa_dec05 | MoFR | 2006 | | Pre | Pre |
| Inventory Ageclass | Ageclass | TNRG Vic. | 2006 | | Pre | |
| Planted Douglas Fir | Fd_plant | Interfor | 2007 | | Pre | |
| Watersheds | Cc_swshd | ILMB | 2006 | | Pre | |

| Inventory Category | Coverage Name | Source Agency[2] | Date of Compilation or Update | Analysis Use[1] | | |
|---|---|---|---|---|---|---|
| | | | | Net | Res | Zone |
| Marbled Murrelet | Mm_hab2006 | MOE | 2007 | | Pre | |
| Slope Coverage | Mslp | MoFR | 2006 | | Pre | |
| Openings | Openings | MoFR | 2006 | | Pre | |
| Floodplain | Cc_flood | MoFR | 2002 | EBM | EBM | |
| Grizzly Bear Habitat | Tgbh | ILMB | 2005 | EBM | EBM | |
| EBM Boundary | EBM_bnd | TNRG / TSA Boundary | 2007 | | EBM | EBM |
| Estuaries | Estuaries | Pac. Coast Est. Prog | 2004 | | EBM | |
| Estuary buffers TT | Est_ebm | TNRG/ Estuaries, VRI | 2007 | EBM | EBM | |
| Estuary buffers MO | Est_mo | TNRG/ Estuaries, VRI | 2007 | EBM | EBM | |
| Archaeological features | Req154north_point | Interfor – Mike Landers | 2007 | EBM | | |
| | Req866king_point | Interfor – Mike Landers | 2007 | EBM | | |
| | Req317 | Interfor – Douglas Sauer | 2007 | EBM | | |
| High Value Fish Habitat | Hvfs | MOE/ILMB | 2005 | EBM | EBM | |
| Known Fish Presence | Lfish_buf | ILMB | 2006 | EBM | EBM | |
| Predicted Landscape Elements | Ple_eco | JST/TNRG | 2007 | EBM | EBM | |
| Buffered Swamps | Swamp | TRIM/TNRG | 2007 | EBM | EBM | |
| Wild Zones | Wildzone | ILMB | 2005 | | EBM | EBM |

(1) Net = netdown; Zone = management zone mapping; Res = resultant

(2) ILMB=Integrated Land Management Bureau, MoFR=Ministry of Forests and Range, MOE=Ministry of Environment, TNRG=Timberline Natural Resource Group, TRIM=Terrain Resource Information Management

## 2.2 Current Forest Cover Inventory

The present vegetation resource inventory (VRI) for the Kingcome TSA was last updated to July 2004 to account for changes in denudation through harvesting, based on imagery and district data. Supplementary logged area mapping was incorporated into the data base to capture additional disturbances. The forest cover VRI was projected to January 2006.

The VRI was found to lack attributes in harvested polygons which became obvious in the first review of the timber harvesting land base (THLB). These gaps in the data were identified as harvested blocks and a composite harvested or logged block layer was provided to Timberline by MoFR. These logged blocks were assumed to represent productive/ potentially harvestable areas, and were used to override non-productive, inoperable, low site, and non-merchantable classifications. Where possible, forest cover attributes were assigned to these harvested areas by using history information from the MoFR Results Database.

It was found that some of the harvested or logged blocks did have appropriate VRI information and that about half of the remaining blocks were identified in the Results history information. The remaining polygons identified as logged blocks were assigned labels for growth and yield modelling purposes. Section 7.1 lists the assumptions made to assign labels.

The forest cover inventory data has been prepared using a geographic information system (GIS). Use of GIS ensures that spatial relationships between inventory attributes are maintained throughout the analysis process.

## 2.3 Forest Cover Inventory – Statistical Adjustment

The phase 2 VRI statistical attribute adjustment study for the Kingcome TSA was completed by J.S. Thrower & Associates in May 2005 (J.S. Thrower, 2005) for the Kingcome TSA licensees. The attribute adjustment is the process of correcting aerial photo-based inventory data from the estimation phase using ground sample observations. The purpose of the adjustments is to obtain unbiased overall averages and totals for the TSA by major species groups and to adjust the existing estimation data to obtain individual stand values (MoFR, March 2004). This analysis indicated that the volume in the timber harvesting land base was underestimated by approximately 9% with a sampling error (at the 95% probability level) of 12.3%.

Seventy-five (75) Phase II ground samples were installed by crews from Kerley & Associates Ltd. in the 2003 field season and 79 net volume adjustment factor (NVAF) trees were destructively sampled by crews from McColl Forestry during the 2004 field season. The target population for the statistical adjustment included polygons in the operable land base with a stand age of at least 30 years that were likely to be included in the timber harvesting land base (THLB) in TSR 3. The target population covered 251,188 ha. Approximately 26% of the area was located in Immature stands (less tha121 years), 32% was located in Low Land cedar stands (stands leading in western red cedar in the CHWvh1 biogeoclimatic zone), and 42% in Mature stands (120 years and older).

NVAF trees were selected across the Kingcome TSA and Tree Farm Licence (TFL) 45. The objective was to estimate NVAF adjustment ratios that would apply to both management units. Results showed that taper equations and net factoring rules under-estimated the true net merchantable volume for dead potential, live immature, and mature cedar trees by 2-3%. For mature hemlock and other mature trees, taper equations and net factoring rules over-estimated true volume by 1% and 3%, respectively.

The following steps were employed to adjust the inventory attributes:

1. Perform analysis on VRI ground sample inventory data and develop inventory file adjustment factors for age and height;
2. Using the factors derived in step 1, adjust height and age in the inventory database files;
3. Based on the adjusted inventory file height and age, use Variable Density Yield Predictor (VDYP Version 6.6d) to compute an "attribute-adjusted" inventory volume;
4. Develop inventory file adjustment factors for volume (using ground sample inventory volume and "attribute-adjusted" inventory volume); and
5. Using the volume adjustment factors derived in step 4; adjust the "attribute-adjusted" inventory volume derived in step 3. The adjusted volumes are based on net factoring with the NVAF applied. This volume is referred to as the final adjusted inventory volume.

Results are presented in Table 2. Following adjustment, both the overall average live net merchantable volume (17.5 cm+) and the average mature volume increased 9% to 503 $m^3$/ha and 627 $m^3$/ha, respectively. The overall average increases were +14%, -1% and +12% for the immature, low land, and mature stands, respectively. The increases were similar for all leading species groups within a maturity group.

Inventory site index decreased on average by 10%. The average decrease was slightly more important in the immature (12%) and low land stands (13%) than in the mature ones (6%).

**Table 2 – Inventory statistical adjustment results**

| Stratum | Area | | Net Merchantable Volume (17.5 cm+) | | | Site Index (m) | | |
|---|---|---|---|---|---|---|---|---|
| | (ha) | (%) | Phase I ($m^3$/ha) | Adjusted ($m^3$/ha) | Difference (%) | Phase I ($m^3$/ha) | Adjusted ($m^3$/ha) | Difference (%) |
| Immature | 67,739 | 26% | 337.3 | 386.1 | 14% | 24.9 | 22.0 | -12% |
| Low Land | 79,896 | 32% | 447.6 | 442.7 | -1% | 12.1 | 10.6 | -13% |
| Mature | 103,552 | 42% | 558.2 | 626.6 | 12% | 14.0 | 13.2 | -6% |
| **Total** | **251,188** | **100%** | **463.4** | **503.2** | **9%** | **16.3** | **14.7** | **-10%** |

One of the project objectives was to estimate average net merchantable volume in the population of interest to within 15% (at the 95% confidence level). This objective has been met since the 95% sampling error for the adjusted net merchantable volume was 12.3%. Based on the coefficient of variation observed in the sample, another 52 plots would be required to decrease the 95% sampling error to 10%.

These site index and volume estimates were utilized only in the natural unmanaged stand yield tables. Section 7.4 Site Index, provides an explanation of the process used to estimate site index for managed stand yields.

The report identified several potential sources of uncertainty in this analysis.

NVAF factors were obtained from two management units. There was concern that these adjustments might differ and therefore applying them to the Kingcome could create bias. No obvious biases were detected.

There was also some concern that inclusion of several outlier sample points in the deciduous-leading immature stratum could have introduced bias in to the results. A larger sample size would be necessary to resolve this.

It was necessary to complete the sampling before the final THLB was established. It is possible that some areas that will be included in the final version of the THLB were not included in the target population from which the Phase II samples were selected, introducing a risk of bias.

There is no approved method for adjusting species composition, although preliminary analysis indicated that the ratio adjustments are not the same for all species in a stratum.

The stratification used for adjustment was based on broad age classes (Immature and Mature). There were concerns that adjustment ratios might be correlated with age, which would cause bias if the ratios are not computed and applied by age class. This was investigated, and only net merchantable volume in the immature stratum showed a slight positive correlation trend.

These results are presented here only to provide a general understanding of the process, and potential uncertainties inherent in a sampling process such as this. The study report should be referred to for a complete description and explanation.

# 3.0 TIMBER SUPPLY ANALYSIS FORECASTS

The British Columbia Timber Supply Review process utilizes forest estate modelling techniques to forecast timber supply characteristics of major management units. Such models require that the land base be stratified and characterized by management objectives.

Management objectives are described by two methods within the forest estate modelling framework. The first method is by considering that the management objective results in exclusion of area for the purposes of timber harvesting. This is often referred to as defining the timber harvesting land base or the netdown process. The second method is through the use of forest cover or adjacency constraints. An example of a forest cover constraint is requiring a specific percentage of a specified management zone to be above a certain age.

Section 4.0 provides a description of Timberline's proprietary spatial timber supply model CASH6 (Critical Analysis of Schedules for Harvesting) that is used in the analysis.

Details about the individual factors determining the timber harvesting land base and management zones for the Pre-EBM and EBM scenarios are found in Sections 5 and 6. Details about regeneration and growth and yield assumptions and the attendant silviculture prescriptions are discussed in Sections 7 and 8. Section 9 provides a summary of the Integrated Resource Management objectives that will be modelled. Section 10 provides a summary of modelling rules to be employed in the analysis.

Finally, Section 11 summarizes the analyses that will be performed to test the sensitivity of the forecasted results to changes in one or more assumptions.

The TSR 3 analysis used the 'best available information'. In this case the best available information includes the information collected by the Kingcome TSA Licensee-Agency Group.

## 3.1 Pre-EBM

The Pre-EBM analysis is built from the TSR 2 analysis completed in October 2002, the details of which are documented in TSR 2 analysis report (MoFR, 2001). The Pre-EBM analysis also takes direction from the comments made by the Chief Forester in the 2002 AAC Rationale for the Kingcome TSA (MoFR, 2002). Information updates and improvements completed since TSR 2 are listed below:

- VRI coverage for the entire TSA;
- VRI phase II attribute adjustments;
- Improved site productivity estimates for managed stands;
- Use of tree improvement program seed;
- Updated spatially explicit road buffers;
- Updated spatially explicit stream buffers;
- Updated cultural heritage sites;
- Updated wildlife habitat information;
- New economic operability assessment;
- New Conservancy and Biodiversity Areas; and
- Allowance for disturbances in the non-timber harvesting land base.

## 3.2 EBM

In November 2006, the Kingcome TSA Timber Supply Review stakeholders composed a letter to the Provincial Chief Forester seeking direction on the role that Ecosystem-Based Management (EBM) should have in TSR. The TSR process is intended to model "current practice" on a management unit yet at that time the final EBM parameters had not yet been set by the Ministry of Forests and Range. Currently, for those who have committed to the process, each Kingcome TSA licensee is at a different stage in their implementation process.

In his January 16, 2007 letter in response, the Chief Forester acknowledged that while the exact EBM framework had not yet been formalized, the development of the actual EBM components should be left to the discretion of the Kingcome TSA stakeholder group. On February 19, 2007, a sub-group of the Kingcome TSA stakeholders met to define the timber supply analysis framework for the Kingcome TSR and finalize the parameters proposed for modelling the key components of EBM. The sub-group included Ted Stevens and Gary Ardron representing First Nations interests, Dave McKay, Gerry Sommers, and Warren Wartig of International Forest Products Ltd., Peter Koefed of Western Forest Products Ltd., Jim Brown, Jennifer Barolet and Christina Mardell of the MoFR, and Tara McCormick, Dave Coster, Laszlo Kardos, and Hamish Robertson of Timberline Natural Resource Group Ltd.

Modelling data sources and assumptions needed to address Ecosystem-Based Management objectives were defined by the group. Since that time, these approaches have been refined as the specifics of each objective have been clarified. For each objective, the specific approach is documented in the appropriate section of this report, depending upon whether it is a netdown factor (Section 5.2), a management zone (Sections 6.2, 9.2) a stand growth and yield adjustment (Section 8.5), or a timber flow consideration (Section 10.9).

The South Central Coast Ministerial Order is now legally established, formalizing the Land Use Objectives for the South Central Coast Area. These objectives address protection of the following resources. In each case, the section reference is listed to refer the reader to the appropriate section of this Data Package. The complete MO text describing the objective is included in the referenced section:

**First Nations**

- Objective 3: First Nations' traditional forest resources (5.2.1);
- Objective 4: First Nations' traditional heritage features (5.2.1);
- Objective 5: Culturally modified trees (5.2.1);
- Objective 6: Monumental cedar (10.9.1);
- Objective 7: Stand-level retention of Western red and Yellow Cedar (10.9.2);

**Aquatic Habitats**

- Objective 8: Important fisheries watersheds (6.2.1);
- Objective 9: High value fish habitat (5,2,2);
- Objective 10: Aquatic habitat that is not high value fish habitat (5.2.3);
- Objective 11: Forested swamps (5.2.4);
- Objective 12: Upland streams (6.2.2);
- Objective 13: Active fluvial units (5.2.5);

**Biodiversity**

- Objective 14: Landscape-level biodiversity (6.2.3);
- Objective 15: Red-listed and blue-listed plant communities (5.2.6);
- Objective 16: Stand-level retention (8.5.1); and
- Objective 17: Sensitive grizzly bear habitat (5.2.7).

These objectives will be modelled within the EBM zone, essentially the mainland portion of the TSA.

# 4.0 FOREST ESTATE MODEL

## 4.1 Model Description

Timberline's simulation model CASH6 (*Critical Analysis by Simulation of Harvesting*) will be used to develop harvest schedules integrating all resource management considerations. The model, which has been used for numerous timber supply reviews, Innovative Forest Practices Agreement, and land use planning analyses, has been accepted for use in timber supply by the MoFR. The model uses a geographic approach to land base and inventory in order to adhere as closely as possible to the intent of forest cover constraints on harvesting. Maximum disturbance and minimum forest cover retention requirements are explicitly implemented.

A variable degree of spatial resolution is available including block-to-block adjacency, depending on inventory formulation and resource emphasis area definitions. Forest stands in refuges such as environmentally sensitive and inoperable areas that do not contribute to the periodic harvest are nonetheless included for their contribution to forest structure at both the stand and landscape levels.

In their current implementation, forest cover objectives require a control area over which to operate. The control area for a constraint set should correspond to a realistic element in the landscape. For example, the requirements associated with visual quality objectives are designed to operate on the scene visible from discrete sets of viewpoints. In aspatial mode, pseudo-geography may be employed to translate spatial constraints on harvesting into forest cover and static access constraints. The objective is to identify the "natural" constituency for forest cover constraints. Numerous levels of land aggregation are used to define both geographically separate areas and areas of similar management regime.

The use of forest cover objectives improves forest management modelling by ensuring that non-timber resources are given appropriate consideration. Cover constraints are applied at different levels of spatial resolution depending on the management zone, or resource emphasis area, in question.

Forest cover objectives place maximum and/or minimum limits on the amount of young, mature and/or old growth found in land base aggregates such as combinations of landscape units and ecosystem units or resource emphasis areas. CASH6 defines the following three classes of forest cover constraints for modelling management objectives within each land base aggregate.

1. Disturbance: the maximum area that can be younger than a specified age or shorter than a specified height. This is intended to model cutblock adjacency and green-up requirements.
2. Old-growth Retention: the minimum area that must be older than, or as old as, a specified age. This is intended to model both retention of cover and retention of old growth.
3. Mature Retention: the minimum proportion of area that must be retained over a lower retention age. This is intended to model thermal cover for wildlife or mature biodiversity requirements. Mature and old growth retention forest cover objectives may overlap and area that qualifies for both is counted in both.

# 5.0 LAND BASE DESCRIPTION

This section describes factors that influence management of the Kingcome TSA land base and the methodology used to determine the way in which land contributes to timber supply. Some portions of the productive land base, while not contributing to harvest, may be available to meet other resource needs.

The section presents the determination of the timber harvesting land base for the Kingcome TSA. Each factor in the table is described in the sections which follow. The order in which these factors are applied to remove areas from the timber harvesting land base is important, as many of the netdown features overlap spatially. In the tables which accompany each of the following sections, productive area represents the total productive area within the feature. Area removed represents the area removal at that step in the netdown process, net of any area overlapping other features previously removed. The classification of land base for contribution to analysis described in this section is based on the procedure outlined in the *Supplemental Guide for Preparing Timber Supply Analysis Data Packages* (MoFR, 2003c).

All of the land base classification steps performed during TSR 2 remain in the current classification. However, the following additions or modifications have been made since TSR 2:

- Existing road losses are now explicitly (spatially) identified and removed from the land base contributing to timber supply;
- Riparian reserve and management zones are now explicitly (spatially) identified and removed from the land base contributing to timber supply;
- Old growth management areas, established within some landscape units, are now identified and removed from the land base contributing to timber supply;
- Landscape units with no old growth management areas are now managed to retention levels set by the Order Establishing Provincial Non-spatial Old Growth Objectives (June 30, 2004);
- Wildlife habitat areas (WHAs) and Ungulate Winter Ranges (UWRs) are now identified and removed from the land base contributing to timber supply;
- Existing forest inventory age and height values were adjusted, and the forest inventory has been updated for disturbance to 2004;
- Archaeological sites have been explicitly identified and the land base contributing to timber supply has been adjusted to account for these areas;
- Karst terrain features are now identified and removed from the THLB;
- Biodiversity Areas and Conservancy Areas either proposed or established as result of the CCLRMP are now removed from the land base contributing to timber supply; and
- EBM objectives requiring areas to be removed from the THLB are incorporated into the netdown process.

The final classification results in a current THLB of 208,175 hectares (Pre-EBM) and 182,052 hectares (EBM), compared to the TSR 2 current timber harvesting land base (168,726 ha) documented in the previous timber supply review analysis report. While reductions to address new Central Coast biodiversity, conservancy and EBM objectives removed significant areas from timber production, these were more than offset by additions based on a new economic operability assessment, and revised low site criteria. The THLB area includes 5,549 hectares of unreverted timber licence areas which do not contribute to the TSA timber supply until after they are harvested and regenerated. Also, 12,937 hectares of recently disturbed areas are included in the

timber harvesting land base. For the purpose of the analysis, these areas area classified as not satisfactorily restocked (NSR) that will successfully regenerate in the first simulation period.

Some parks and protected areas not managed by the BC Forest Service are included in the land base for analysis, as they contribute to non-timber objectives such as old-growth seral requirements to maintain landscape-level biodiversity.

The netdown results are summarized in Table 3. The productive area values in this table represent the total productive area of the feature, regardless of area removed previously. Pre-EBM netdowns are listed in Section 5.1 and additional EBM netdowns in Section 5.2.

**Table 3 – Timber harvesting land base (THLB) determination**

| Land Classification | Refer to Section | Land Base | | | Productive Area (ha) |
|---|---|---|---|---|---|
| | | Area (ha) | % of Crown | Volume (000 $m^3$) | |
| **Total Area** | | 1,172,428 | | | |
| Exclusions from the total crown forest | 5.1.1 | 21,274 | | | 0 |
| **Total Crown Forest** | | 1,151,154 | 100 | | |
| Non-forest | 5.1.2 | 369,252 | 32.1 | 0 | 0 |
| Existing roads | 5.1.3.1 | 4,457 | 0.4 | 0 | 0 |
| Non-productive | 5.1.4 | 126,749 | 11.0 | 0 | 0 |
| **Productive Forest** | | 650,696 | 56.5 | 254,265 | |
| Protected | 5.1.5 | 32,781 | 2.8 | 13,832 | 32,781 |
| G2G Biodiversity | 5.1.6 | 14,088 | 1.2 | 4,844 | 14,215 |
| G2G Conservancy | 5.1.6 | 51,504 | 4.5 | 21,083 | 52,037 |
| Inoperable | 5.1.7 | 175,871 | 15.3 | 59,260 | 251,967 |
| **Operable Forest** | | 376,452 | 32.7 | 155,246 | |
| Sites with low growing potential | 5.1.8 | 101,077 | 8.8 | 34,530 | 238,106 |
| Non-merchantable | 5.1.9 | 999 | 0.1 | 322 | 11,836 |
| Environmentally sensitive – full netdown | 5.1.11 | 5,146 | 0.4 | 2,548 | 35,026 |
| Riparian | 5.1.13 | 30,222 | 2.6 | 12,146 | 69,824 |
| Wildlife Habitat (wha + uwr) | 5.1.14 | 3,095 | 0.3 | 1,951 | 14,725 |
| Old Growth Management Areas | 5.1.15 | 1,544 | 0.1 | 964 | 9,491 |
| Archaeological Sites | 5.1.16 | 1,476 | 0.1 | 648 | 4,099 |
| Karst | 5.1.17 | 138 | <0.1 | 42 | 3,768 |
| Environmentally sensitive – partial netdown | 5.1.10 | 13,778 | 1.2 | 7,391 | 96,979 |
| Unstable terrain – partial netdown | 5.1.12 | 10,802 | 0.9 | 4,964 | 156,323 |
| Total Operable Reductions (Pre-EBM) | | 168,278 | 14.6 | 65,506 | |
| **Current THLB (Pre-EBM)** | | 208,175 | 18.1 | 89,740 | |
| **EBM Exclusions** | | | | | |
| Objective 3-5 – First Nations | 5.2.1 | 1,072 | 0.1 | 481 | 4,099 |
| Objective 9 - High Value Fish Habitat | 5.2.2 | 7,052 | 0.6 | 3,052 | 38,374 |
| Objective 10 - Not High Value Fish Habitat | 5.2.3 | 1,462 | 0.1 | 856 | 30,711 |
| Objective 11 – Forested Swamps | 5.2.4 | 209 | <0.1 | 100 | 1,998 |
| Objective 15 - Red-listed Plant Communities | 5.2.6 | 188 | <0.1 | 134 | 2,247 |
| Objective 15 – Blue-listed Plant Communities | 5.2.6 | 13,095 | 1.1 | 8,378 | 48,601 |

| Land Classification | Refer to Section | Land Base | | | Productive Area (ha) |
|---|---|---|---|---|---|
| | | Area (ha) | % of Crown | Volume (000 $m^3$) | |
| Objective 17 – Grizzly | 5.2.7 | 3,046 | 0.3 | 809 | 14,511 |
| Total Operable Reductions (EBM) | | 26,123 | 2.3 | 13,810 | |
| **Current THLB (EBM)** | | 182,052 | 15.8 | 75,930 | |
| Less future roads (pre-EBM) | 5.1.3.2 | 3,071 | 0.3 | | |
| Less future roads (EBM) | 5.1.3.2 | 2,647 | 0.2 | | |
| **Future THLB (Pre-EBM)** | | 205,104 | 17.8 | | |
| **Future THLB (EBM)** | | 179,405 | 15.6 | | |

## 5.1 Pre-EBM THLB Determination

### *5.1.1 Exclusions from the Total Crown Forest*

The total area of the Kingcome TSA is 1,172,428 hectares. For timber supply purposes, private land, and crown land that is either managed by agencies other than the MoFR or administered by the MoFR but not a part of TSR 3 (*i.e.* woodlot licences) are generally excluded.

Although a revised ownership definition within the Kingcome TSA is underway, it has not been included in the analysis as it was not determined by the cut-off date for inclusion. A sensitivity analysis will be completed however, if the definition is established during the timber supply review.

Table 4 shows the area excluded from the timber harvesting land base. Ownership codes are generally used to identify whether land can be considered to contribute to timber supply. Ownership Codes which do not signify crown land in a forest management unit or timber licence land (see Section 5.1.19) are generally removed. These codes are those currently defined in the ownership layer. In the case of woodlots, these attributes are overridden by information contained in a separate woodlot GIS layer provided by MoFR.

**Table 4 – Land base reductions for land not administered by MoFR**

| Land classification | Ownership Code | Area Removed (ha) |
|---|---|---|
| Private - Crown Grant | 40N | 11,518 |
| Federal Reserve | 50N | 803 |
| Indian Reserve | 52N | 6,197 |
| Woodlots (ownership code overridden by designation in woodlot coverage) | | 2,756 |
| **Total** | | **21,274** |

### *5.1.2 Non-forest*

Non-forest land includes areas that are either not vegetated, such as lakes, rocks and shrubs that occupy less than 5% of the land, etc., or are unreported. Non-forest land also includes vegetated areas where less than 10% of the area is occupied by trees. With the exception of areas classified

as bare ground or little tree cover but recently logged, all these non-forest areas are considered non-contributing to timber supply and are excluded from the Kingcome TSA (Table 5).

**Table 5 – Land base reductions for non-forest**

| Classification | Area Removed (ha) |
|---|---|
| Non-Forested | 369,252 |
| **Total** | **373,709** |

### 5.1.3 Roads, Trails and Landings

Forest operations create roads, trails, and landings that can reduce the productivity of growing sites, and reduce the area available for growing trees. Many existing roads and trails are identified as line features in the digital inventory. For input to modelling, areas and volumes associated with existing roads, trails, and landings must be estimated and removed from the timber harvesting land base. In addition, there are changes in available growing area and productivity for future stands due to road building disturbance.

#### 5.1.3.1 Existing Roads, Trails and Landings

Existing roads for the Kingcome TSA are described as line features from the following sources:

- Consolidated road coverage used for the *Kingcome TSA Economic Operability Assessment* (Timberline 2006); and
- Licensee road classification by chart area (May 2006).

As the sources and detail of this information are varied, it is not possible to provide a meaningful summary by road classification. Existing roads have been spatially netted out of the land base using a 14 meter buffer width. This buffer width reflects an overall average site loss associated with road and cutblock development, and is based on the following assumptions:

- Average side slope: 50%
- Width of cut and running surface for 50% average side slope: 10 meters
- Average side cast: 6.5 meters
- Percent of side cast considered to be productive: 50%
- Allowance for quarries, landings and turnouts: 0.5 meters
- Total road allowance = 10 + (6.5 x .5) + 0.5 = 13.75 (rounded to 14 meters).

Existing road exclusions are shown in Table 6.

**Table 6 – Land base reductions for existing roads**

| Classification | Area Removed (ha) |
|---|---|
| Existing roads | 4,457 |
| **Total** | **373,709** |

#### 5.1.3.2 Future Roads, Trails and Landings

Upon harvesting, a component of each stand is placed into a category that will remain in a disturbed state in perpetuity. If the area harvested is included in an area associated with forest cover constraints relating to integrated resource management, the road area will become part of the disturbance area permanently.

Generally these stands will provide harvest volume on the first entry but not on further entries. The area contributing to the long-term sustainable harvest is net of this amount. In CASH6, a percentage reduction will be applied to reduce the area of each newly-roaded forest class the first time it is harvested. In these cases, area reductions are made in the timber supply analysis after the volume is credited to the harvest.

The area that will be removed from the THLB for future reading was determined by applying a 14 meter buffer to the future roads developed for the Kingcome Economic Operability Study, and overlaying these areas on the existing THLB to determine the net area which will be removed. A summary by age class is provided in Table 7. However, the operability study also indicated that the proposed road network underestimated the actual roading requirements by approximately 16% (*Kingcome TSA Economic Operability Assessment,* Timberline, 2006). Therefore, these areas were increased by 16% to account for this bias. The majority of these removals fall in stands above age 40. The THLB area in these age classes totals 155,807 hectares, and the estimated future roaded area (3,071 hectares) represents 1.97% of this amount. Therefore, to model the correct area in future roads, a 2 % future road reduction will be applied to all stands currently greater than age 40 on the first entry.

**Table 7 – Land base reductions for future roads, trails and landings**

| Age Class | THLB Area (ha) | THLB + 16% (ha) |
|---|---|---|
| 0 | 144 | 167 |
| 1-20 | 97 | 113 |
| 21-40 | 66 | 77 |
| 41-60 | 204 | 237 |
| 61-80 | 287 | 333 |
| 81-100 | 142 | 165 |
| 101-120 | 109 | 126 |
| 121-140 | 42 | 49 |
| 141-250 | 253 | 294 |
| 251+ | 1,302 | 1,510 |
| **Total** | **2,647** | **3,071** |

#### 5.1.4 Non-productive

Non-productive and non-commercial lands (Table 8) were removed based on age or site productivity:

- Mature stands with Crown closure < 10% (< 30% for Hemlock); or
- Stands with no assigned species or a site index < 5.0.

**Table 8 – Land base reductions for non-productive**

| Criteria | Area Removed (ha) |
|---|---|
| Crown closure-based | 88,579 |
| Productivity-based | 38,170 |
| **Total** | **126,749** |

### 5.1.5 Protected Areas

While protected areas are not managed for timber supply, the forested areas within them contribute to non-timber objectives, and they therefore are included in the land base for analysis. These areas were either identified based on ownership, or by a separate protected area (PA) coverage. Areas are summarized in Table 9.

**Table 9 – Land base reductions for protected areas**

| Criteria | Name | Productive Area (ha) | Area Removed (ha) |
|---|---|---|---|
| Ownership layer | Crown Reserves | 3,143 | 3,142 |
| PA coverage | Beresford Island Ecological Reserve | 2 | 2 |
| | Brooks Peninsula Park | 6,995 | 6,995 |
| | Broughton Archipelago Marine Park | 1,899 | 1,899 |
| | Cape Scott Park | 16,022 | 16,022 |
| | Cormorant Channel Marine Park | 238 | 238 |
| | Duke of Edinburgh Ecological Reserve | 57 | 57 |
| | Echo Bay Marine Park | 0 | 0 |
| | God's Pocket Marine Park | 538 | 538 |
| | Kingcome River / Atlatzi River Ecological | 385 | 385 |
| | Klaskish River Ecological Reserve | 126 | 126 |
| | Lanz and Cox Islands Park | 1,340 | 1,340 |
| | Lawn Point Park | 499 | 499 |
| | Schoen Lake Park | 1,537 | 1,537 |
| **Subtotal from PA coverage** | | 29,639 | 29,639 |
| **TSA Total** | | 32,781 | 32,781 |

### 5.1.6 G2G Biodiversity and Protected

The April 2006 orders-in-council established Central Coast Designated Area No. 2 for protection from harvesting under Part 13 of the Forest Act. Two categories of protected areas were identified, Conservancy Areas and Biodiversity Areas. More than half of the proposed Conservancy Areas have been legally designated and work is ongoing to designate the remaining Conservancies and the Biodiversity Areas.

Under Section 170 (2) of the Forest Act the Minister of Forests and Range, by written order, has suspended plans, prescriptions, cutting permits, timber sale licences and road permits within the Central Coast Designated Area No.2 (with some specified exemptions) and has directed that any

person authorized to issue a permit, licence or plan not to do so if any part of the permit, licence or plan is in the designated area, unless exempted in the Minister's Order. Therefore, the Central Coast Designated Area is assumed to be reserved from logging in the timber supply analysis, and the areas removed from the THLB. Table 10 lists the areas removed from the THLB. A map showing the locations of all protected areas will be posted on the Kingcome TSR 3 website.

**Table 10 – Land base reductions for Central Coast Designated Area No. 2**

| Theme | Name | Productive Area (ha) | Area Removed (ha) |
|---|---|---|---|
| Conservancy | Boat Bay | 9 | 4 |
| | Broughton | 4,077 | 4,008 |
| | Burdwood Group | 117 | 1 |
| | Catto Creek | 847 | 847 |
| | Dzawadi/Klinaklini Estuary | 2 | 2 |
| | Hunwadi / Ahnuhati – Bald | 9,167 | 9,167 |
| | Hunwadi/Ahnuhati-Bald | 10,787 | 10,787 |
| | Kingcome Estuary | 28 | 28 |
| | Mahpahkum-Ahkwuna | 881 | 699 |
| | Oogwewa'/Cape Caution | 4,527 | 4,402 |
| | Polkinghorn Islands | 149 | 119 |
| | Tsa-Latl/Smokehouse | 179 | 179 |
| | Upper Klinaklini River | 20,733 | 20,733 |
| | Wahkash Point | 174 | 174 |
| | Wakeman Estuary | 132 | 132 |
| | Waw Wat'l/Seymour Estuary | 229 | 224 |
| **Subtotal** | | **52,037** | **51,504** |
| Biodiversity | Adeane Point-mining | 1,300 | 1,300 |
| | Hanson Island-head_lease | 21 | 3 |
| | Inland Cape Caution-mining | 1,965 | 1,965 |
| | Shelter Bay-mining | 5,755 | 5,646 |
| | Waump-mining | 5,174 | 5,174 |
| **Subtotal** | | **14,215** | **14,088** |
| **Total** | | **66,252** | **65,592** |

### *5.1.7 Economically Inoperable*

In TSR 2, it was apparent that the existing operability assessment significantly understated the economic availability of timber on the TSA. To address this, The Kingcome TSA Economic Operability Study was completed in 2006 (*Kingcome TSA Economic Operability Assessment* Timberline, 2006). This model was applied to all commercial species including cottonwood and alder, and was based on a Value Index, *i.e.* the difference between timber values and delivered wood costs for each stand of timber. The model was based on 2006 delivered wood costs, 10 year median log price selling price table and representative log grade distributions. It was necessary to establish a Value Index threshold to determine profitability. Upon first consideration, it would seem logical to use the breakeven point (no profit or loss when the stand

is harvested). However, the following assessment supports the use a negative profit margin when determining which stands are economically operable.

Of the 56 cutting permits (CPs) reviewed for this project, 20 had a negative value index. Twelve of those were below $-10.00, and six were below $-20.00. In fact, the average volume-weighted Value Index for the helicopter CPs examined was $-9.94. Market variability and business cycles result in changes in economic thresholds for harvesting. The economic operability analysis is designed to avoid "spot market" conditions and assess availability over the long-term time horizon of the analysis. There is always a core component of the land base that will be available under most economic conditions. In addition, other more marginal components move in and out of economic availability, and harvest planning allows these stands to be accessed under the right market conditions.

These results support the conclusion that licensees on the coast have been able to harvest blocks that would appear to be unprofitable according to a strict application of the CVP system. In support of this harvesting, Interfor points out that:

1. Higher value stands harvested by licensees will frequently subsidize the development of marginal stands making them economically viable; and
2. Licensees with post-processing facilities may also harvest at a loss to maintain their customer base and to prevent substitution to other materials.

For these reasons, a stand was deemed inoperable if the net value (timber value minus delivered wood costs) was less than a $-10 profit margin. Scenarios using $-20 and $0 profit margins will be explored as sensitivities.

The preliminary results of this study were reviewed by licensees and staff of the North Island-Central Coast Forest District staff, and their comments were taken into consideration in developing the final economic operability definition.

Reductions to the timber harvesting land base due to inoperability are shown in Table 11. It should be noted that the area considered to be inoperable includes the entire Klinaklini supply block.

**Table 11 – Land base reductions for inoperable areas**

| Inventory Description | Code | Total Area (ha) | Productive Area (ha) | Area Removed (ha) |
|---|---|---|---|---|
| **Inoperable** | **I** | **760,547** | **251,967** | **175,871** |

### *5.1.8 Low Growing Potential*

These stands do not currently have high enough timber volumes to make harvesting feasible and are not likely to achieve a harvestable volume over a reasonable time horizon. Stands may fall into this category in two ways:

1. The site is either not fully occupied by commercial tree species; or
2. The productivity of the site limits timber growth.

In the TSR 2 AAC determination rationale document, with reference to the low site criteria used, the Chief Forester stated that "…*the minimum volume requirements appear to be high in comparison to those used in the timber supply analyses for other coastal units. I also noted that the criteria used to exclude low productivity stands from the timber harvesting land base resulted in the exclusion of some very old stands that met the minimum volume criteria but were below the minimum site index value*." Licensees at that time were also concerned that the approach resulted

in exclusions from the THLB in conditions where operational performance could be demonstrated. Consequently, in the *Implementation* section of the *Rationale*, the Chief Forester directed staff to "…*continue to review and refine the criteria used to identify low productivity stands in preparation for the next determination.*".

During a meeting with most licensees in attendance it was agreed that the TSR 2 thresholds for cedar and hemlock/balsam should be reviewed. The basis for this review was an assessment of demonstrated performance and future harvesting opportunities in the low site stands. Two harvest history and planning data sources were reviewed to assess the productivity spectrum in which licensees are presently operating.

To address the concerns noted above by the Chief Forester in his TSR 2 Determination, analysis of MoFR Results data and Interfor harvest block data were used to investigate performance in the inoperable. Results of this analysis indicated a significant level of performance in stands with site indices (SI) below the original low site thresholds used in TSR 2 (site index thresholds generated in VDYP6 based on the volume thresholds used). Specifically, a significant level of harvesting has been and is occurring in the SI range of 10-11 metres for cedar/cypress, and 12-13 metres for hemlock/balsam. Below these levels, while some harvesting is occurring, the performance clearly falls off. Consequently, conservative thresholds were selected. Minimum site index thresholds of 10.5 metres for cedar, and 12.5 metres for hemlock/balsam were selected to reasonably reflect past performance and future opportunities. Both data sources supported this conclusion. Although the data indicated that at least 5% of the harvesting occurs below these levels, this is probably offset by the fact that there will be some areas above the thresholds that would be excluded for productivity reasons as well.

Notwithstanding the above, MoFR staff remain concerned that the cedar/cypress and hemlock/balsam thresholds are lower than warranted. To address this issue, all parties agree that the lower site conditions in question (site index values between 10.5-11.0 metres for cedar/cypress and 12.5-13.5 metres for hemlock/balsam) should be grouped and monitored by analysis unit as a separate component, in order that their contribution to timber supply can be evaluated and regulated, if deemed necessary to prevent unrealistic reliance on these stands in a particular simulation period.

TSR 2 low site thresholds for Douglas fir (Fdc) and spruce were unchanged. No thresholds were applied to other species. The revised criteria for exclusion are listed in Table 12, along with the areas removed.

**Table 12 – Land base reductions for sites with low growing potential**

| Leading Species | Site Index (m) | Total Area (ha) | Productive Area (ha) | Area Removed (ha) |
|---|---|---|---|---|
| Cedar/cypress | < 10.5 | 174,711 | 141,257 | 77,624 |
| Douglas Fir | < 20.2 | 8,394 | 6,819 | 265 |
| Hemlock/Balsam | < 12.5 | 196,533 | 89,118 | 23,092 |
| Spruce | < 10.8 | 1,046 | 912 | 96 |
| **Total** | | **380,684** | **238,106** | **101,077** |

It should be noted that application of the logging history information as described in Section 2.2, can result in the inclusion of areas which fall below either the economic operability or low site thresholds. The rationale is that these stands have been logged previously, and therefore represent reasonable future logging opportunities.

### 5.1.9 Non-merchantable

Non-merchantable forest types are currently not utilized in the Kingcome TSA. The areas are physically operable and exceed low site criteria but because of the inherent low economic opportunity they are not currently utilized. The criteria are listed in Table 13.

**Table 13 – Land base reductions for non-merchantable forest types**

| Species | Total Area (ha) | Productive Area (ha) | Area Removed (ha) |
|---|---|---|---|
| **Pine** | **20,272** | **11,836** | **999** |

### 5.1.10 Deciduous Species

Alder and aspen/cottonwood leading types were not excluded from the THLB, unless they were removed for factors other than species (eg. inoperable, riparian). Instead they have been assigned separate analysis units, and can be incorporated into the analysis in whole or in part depending upon the scenario. However, deciduous volumes have been excluded from yield curves for coniferous-leading types.

In total, 6,394 hectares of alder leading types and 648 hectares of cottonwood leading types are included in the Pre-EBM THLB.

The alder area compares to approximately 1,080 hectares included in TSR 2 (no cottonwood leading types were included in TSR 2). This is primarily due to the revised economic operability criteria, which based the inclusion of alder on a timber value of $\$70.28/m^3$. As well, there was no explicit low site threshold applied to alder, as the site index values were not deemed to be sufficiently reliable to permit this. Notwithstanding this, it is recognized that while the availability of alder may have been understated in TSR 2, not all of the currently included area may ultimately be economically accessible. In particular, 2,347 hectares of this alder component is currently over age 70, approaching the maximum age when alder is considered to be merchantable.

Currently, the Coast Region FRPA Implementation Team (CRIT) Silviculture Committee is developing a hardwood management strategy for the Coast Region. A draft discussion paper "*Hardwood Management in the Coast Forest Region*" has been prepared. This report suggests an interim target "*to actively manage for and grow up to 1,200 hectares/year of hardwood species for sawlog production*" (CRIT Unpublished draft report, 2008). The target for the North Island Central Coast Forest District is 200 hectares per year. It also suggests optimum rotations of 25-35 years to produce a minimum alder sawlog. This would require a very aggressive silviculture regime, with high initial densities, live crown management and density control. The VDYP/TIPSY yield curves employed in this analysis are based on more conventional regeneration strategies, and therefore the attendant yields and minimum harvest ages are considered to be very conservative.

In the base case timber supply analysis the harvest of deciduous species will be capped at approximately 25,000 cubic metres. This will create a requirement for approximately 70-80 hectares of hardwood silviculture per year, which appears to fall well within the silviculture targets suggested in the discussion paper. Alternative scenarios may also be explored to determine the implications of different harvest flows on the sustainability of the hardwood resource and the attendant silviculture requirements. These scenarios will include exclusion of the alder component currently greater than age 70.

### 5.1.11 Environmentally Sensitive Areas

ESA mapping for the Kingcome TSA was completed in 1978 for a variety of non-timber values. For soils, avalanche and regeneration problem categories, this mapping remains the "best available information" on a particular resource value or feature and was used in this timber supply analysis. It is however, recognized that this information is dated, and its reliability is questionable.

For recreation and wildlife habitat features, additional information has been acquired and was used in place of ESA mapping. Wildlife netdowns are summarized in Section 5.1.14.

Assessment of the current recreation inventory (REC) obtained from the ILMB concluded that the map is inaccurate (especially for class H/VH and H/H polygons) and incomplete (Southeast of Knight Inlet)[1], and that a review and adjustment was required to fix major issues in the recreation features inventory. Independent of the inventory there exists data (FTEN) for recreation tenures and reserve in layers in the ILMB.

The recreation inventory map (REC) was reviewed, along with the polygons, lines and points in the FTEN layers and recommendations made for appropriate criteria to remove areas from the THLB.

It was concluded that the two data sources, if used together, constitute the best available data on recreation management in the TSA. In this arrangement recreation features polygons were removed from the THLB as indicated in Table 14. In addition, features in FTEN layers were removed.

**Table 14 – Supplementary recreation netdown sources**

| Coverage | Sensitivity | Significance | Removal (% criteria) |
|---|---|---|---|
| FTEN | - | - | 100% |
| REC | H | VH, H | 100% |
| | H | M | 50% |
| | M | VH, H | 50% |

For the purposes of timber supply analysis, percent area reductions were used to remove areas from the THLB. The amounts of reduction applied for a particular ESA category are outlined in Table 15.

[1] C.J. Cornfield , Recreation Officer, Ministry of Tourism, Sport and the Arts, Discovery Coast Recreation District

**Table 15 – Land base reductions for ESAs**

| ESA category | Criteria | Reduction (%) | Total Area (ha) | Productive Area (ha) | Area Removed (ha) |
|---|---|---|---|---|---|
| Avalanche | Ea1 | 100 | 3,994 | 3,359 | 371 |
| Recreation | FTEN | 100 | 2,826 | 2,786 | 383 |
| Recreation | RECINV | 100 | 988 | 908 | 215 |
| Regeneration | Ep1, Ep2 | 100 | 30,858 | 23,350 | 4,177 |
| **Subtotal – full netdowns** | | | **43,350** | **35,026** | **5,146** |
| Soils | Es1 | 80 | | 44,578 | 9,812 |
| Recreation | RECINV | 50 | | 52,401 | 3,966 |
| **Subtotal – partial netdowns** | | | | **96,979** | **13,778** |
| **TSA Total** | | | | **132,005** | **18,924** |

### *5.1.12 Unstable Terrain*

The 1978 ESA mapping for areas of sensitive terrain is known to have some limitations. In particular, no areas of moderately sensitive terrain (Es2) have been mapped. In the last timber supply review, forest district staff conducted a study of detailed terrain stability to attempt to quantify the potential mapping problem. That study indicated that while there appeared to be only a slight underestimation of Class V areas (Es1), a large area of potential Class IV (Es2) area is not been identified.

While the 80 percent partial netdown for ESA = Es1 is considered to be a reasonable allowance for terrain class V areas, the Es2 classification does not accurately reflect terrain class IV. As was the case in TSR 2, slope-based factors have been applied to predict the area of operable land base in moderately unstable terrain (which is assumed to be equivalent to Es2). A reduction of 20 percent was then applied to these categories. Table 16 provides a summary of areas removed for this condition.

**Table 16 – Land base reductions for unstable terrain**

| Slope Class | Predicted Percent of Class IV Terrain | Reduction (%) | Total Area (1) (ha) | Productive Area(1) (ha) | Area Removed (ha) |
|---|---|---|---|---|---|
| 0-20% | 3.5 | 20 | 9,744 | 6,233 | 369 |
| 21-40% | 15.8 | 20 | 39,100 | 25,730 | 2,142 |
| 41-60% | 38.9 | 20 | 101,396 | 51,391 | 4,065 |
| 61-80% | 50.6 | 20 | 92,158 | 44,343 | 2,978 |
| 81-100% | 43.1 | 20 | 28,324 | 13,596 | 855 |
| 101+% | 32.7 | 20 | 39,819 | 15,030 | 393 |
| **TSA Total** | | | **310,541** | **156,323** | **10,802** |

(1) Area in slope class x predicted percent

### 5.1.13 Riparian Reserves and Management Zones

Riparian zones along waterways are required by the *Forest Range and Practices Act* to protect aquatic and terrestrial habitat. In TSR 2, riparian reserve zones were accounted for aspatially with a 4.2% reduction in the land base contributing to timber supply being applied. For this analysis, an explicit (spatial) stream buffering approach was employed. Riparian management areas were generated as buffer polygons around these features based on their classifications. The water features for the Kingcome TSA are currently compiled from two sources:

- Terrain Resource Inventory Mapping (TRIM); and
- Stream classification by licensee chart area.

Water features which have been categorized by the licensees are assumed to be the best information available. These areas are buffered according to the recommendations outlined in the *Riparian Management Area Guidebook* (Mover, 1995).

Water features outside of those provided by the licensees are based on TRIM and are classified as follows:

- Double line rivers are assumed to be S1;
- Single line rivers are classified using the slope of the stream reach and the distinction between definite/indefinite and intermittent streams (Table 17); and
- Lakes are categorized L1 to L4 based on area and BEC zone as outlined in the *Riparian Management Area Guidebook*. Marshes are categorised W1 to W4 using the same process. Wetland complexes (W5) were identified by producing 60 and 80 metre buffers around appropriately size wetlands and determining which of those wetlands and their buffers formed a "complex".

These are also buffered based on the recommendation outlined in the *Riparian Management Area Guidebook*. Categories of streams are summarized in Table 17.

**Table 17 – Stream categories**

| Stream Class | Single Line Water Type | Slope Class |
|---|---|---|
| S2/S3 | Definite & Indefinite | <20% |
| S4 | Intermittent | <20% |
| S5 | Definite & Indefinite | >= 20% |
| S6[(1)] | N/A | N/A |

[(1)] – N/A for TRIM base, licensee

#### 5.1.13.1 Streams and Rivers

Where available, stream classification was based on information submitted with Forest Development Plans. This inventory is updated as operational inventories are completed for planned harvest blocks. Stream reaches that are currently not inventoried are classified according to local knowledge and by relating to inventoried stream reaches. The number of mapped smaller streams has increased with the application of enhanced TRIM map data. The netdowns for riparian management areas follow the direction defined in the *Riparian Management Area Guidebook*. The classifications and associated stream buffer widths are summarized in Table 18.

**Table 18 – Land base reductions for streams**

| Stream Class | Reserve Zone (RRZ) (m) | Management Zone (RMZ) (m) | RMZ Basal Area Retention (%) | Combined Riparian Zone Width[(1)] (m) | Area Removed (ha) |
|---|---|---|---|---|---|
| S1 | 50 | 20 | 50 | 60 | 1,637 |
| S2-S3 | 30 | 20 | 50 | 40 | 21,901 |
| S4 | 0 | 30 | 25 | 8 | 357 |
| S5 | 0 | 30 | 25 | 8 | 4,632 |
| S6 | 0 | 20 | 5 | 0 | 5 |
| **TSA Total** | | | | | **28,532** |

(1) Combined riparian zone width = reserve zone + (management zone * (basal area retention / 100))

### *5.1.13.2 Lakes and Wetlands*

Buffers and management area netdowns are consistent with the *Riparian Management Area Guidebook* for wetlands and smaller lakes. Buffers have been created adjacent to mapped lakes and wetlands and netdowns applied as described in Table 19.

**Table 19 – Land base reductions for lakes and wetlands**

| Lake/Wetland Class | Reserve Zone (RRZ) (m) | Management Zone (RMZ) (m) | RMZ Basal Area Retention (%) | Combined Riparian Zone Width[(1)] (m) | Area Removed (ha) |
|---|---|---|---|---|---|
| Unclassified | | | | | 33 |
| L1 | 10 | 0 | 25 | 10 | 730 |
| L2 | 10 | 20 | 25 | 15 | 3 |
| L3 | 0 | 30 | 25 | 8 | 88 |
| L4 | 0 | 30 | 25 | 8 | 2 |
| ***Subtotal*** | | | | | ***856*** |
| Unclassified | | | | | 96 |
| W1 | 10 | 40 | 25 | 20 | 277 |
| W2 | 10 | 20 | 25 | 15 | 0 |
| W3 | 0 | 30 | 25 | 8 | 246 |
| W4 | 0 | 30 | 25 | 8 | 0 |
| W5 | 10 | 40 | 25 | 20 | 215 |
| ***Subtotal*** | | | | | ***834*** |
| **TSA Total** | | | | | **1,690** |

(1) Combined riparian zone width = reserve zone + (management zone * (basal area retention / 100))

Table 20 summarizes the riparian management area reductions to the THLB in the Kingcome TSA.

**Table 20 – Land base reductions for riparian management areas**

| Description | Total Area (ha) | Productive Area (ha) | Area Removed (ha) |
|---|---|---|---|
| **Streams, lakes and wetlands** | **106,314** | **69,824** | **30,222** |

### 5.1.14 Identified Wildlife Habitat

Under the Forest and Range Practices Act, the Minister of Environment has identified two categories of species: Species at Risk and Regionally Important Wildlife which together are referred to as Identified Wildlife. An Identified Wildlife Management Strategy (IWMS) provides direction, policy, procedures and guidelines for managing Identified Wildlife. These include the establishment of wildlife habitat areas (WHAs) and the implementation of general wildlife measures (GWMs) and wildlife habitat area objectives, or through other management practices specified in strategic or landscape level plans.

Wildlife habitat areas (WHAs) are areas managed for selected species and plant communities that have been designated under the Forest Practices Code as Identified Wildlife. Since TSR 2 many WHAs have come into force. In areas where harvesting is prohibited in a WHA, that area was removed from the THLB (Table 19).

The Kingcome Ungulate Winter Range (UWR) areas were officially established on June 9, 2006. Legal boundaries of these areas have been incorporated into the database for this analysis, and the areas removed from the THLB. (Table 21).

**Table 21 – Land base reductions for wildlife habitat areas**

| Description | Total Area (ha) | Productive Area (ha) | Area Removed (ha) |
|---|---|---|---|
| Wildlife habitat | 2,312 | 2,286 | 1,127 |
| Ungulate Winter Range | 24,264 | 12,439 | 1,968 |
| **Total** | **26,576** | **14,725** | **3,095** |

### 5.1.15 Old Growth Management Areas

Old growth management areas were defined within a number of landscape unit/biogeoclimatic ecosystem classification variant combinations by selecting those areas as prescribed in the *Landscape Unit Planning Guide* (LUPG) (MoF, 1999). In order to meet these landscape level objectives two broad categories were characterized:

- Objectives specific to the LUPG; and
- Objectives specific to the current operational planning requirements.

Under the first objective, the LUPG requires that OGMAs be representative of the various ecosystems, where each ecosystem has a representative percentage of productive area that must be retained in older age classes. Under the second objective, the selection process was designed to reflect the operational commitments currently in place on the TSA.

OGMAs have been identified for five landscape units in the Kingcome TSA (Table 22). For the Pre-EBM analysis these areas are assumed to satisfy all seral biodiversity requirements and are unavailable for timber supply. These areas and the reductions to the timber harvesting land base

are listed in Table 21. Old growth requirements will be met for the balance of the landscape units by applying old growth seral constraints at the Landscape Unit (LU)/BEC level (Section 9.2.2).

**Table 22 – Land base reductions for old growth management areas**

| OGMA (Landscape Unit) | Total Area (ha) | Productive Area (ha) | Area Removed (ha) |
|---|---|---|---|
| Malcolm | 814 | 808 | 535 |
| Nahwitti | 1,851 | 1,805 | 253 |
| San Josef | 2,867 | 2,581 | 231 |
| Shushartie | 1,557 | 1,480 | 283 |
| Tsulquate | 2,880 | 2,817 | 242 |
| **TSA Total** | **9,969** | **9,491** | **1,544** |

### *5.1.16 Archaeological Sites*

Mapped archaeological sites (buffered point locations and mapped sensitive areas) were used to develop an appropriate netdown factor for timber supply analysis purposes. A 50-metre protection buffer was placed around all point locations. As this spatial information is not available for general distribution, and will not be included in the final archived spatial resultant data set, it was only used as background to develop aspatial netdown factors for timber supply analysis purposes. To accomplish this, the buffered areas were overlaid on the existing THLB. This information was then reviewed by licensee and First Nations representatives, and an aspatial netdown factor determined. This factor (0.63%) was applied to all harvestable polygons. (Table 23).

**Table 23 – Land base reductions for archaeological sites**

| Description | Total Area (ha) | Productive Area (ha) | Area Removed (ha) |
|---|---|---|---|
| **Archaeological Sites** | **7,252** | **4,099** | **1,476** |

### *5.1.17 Karst Features*

In order to protect natural karst terrain systems and processes in the Kingcome TSA, mapped Karst features have been reviewed to determine an appropriate netdown to allow for protection of karst areas. Mapping of the high Karst Potential Areas was reviewed by licensees, and an appropriate netdown factor established. It was estimated that 8% of the mapped area falling within the THLB should be reserved from harvesting, and an 8% aspatial netdown factor was therefore applied to these mapped polygons (Table 24).

**Table 24 – Land base reductions for Karst**

| Description | Total Area (ha) | Productive Area (ha) | Area Removed (ha) |
|---|---|---|---|
| **Karst** | **4,321** | **3,768** | **138** |

### 5.1.18 Wildlife Tree Patches

Biodiversity planning is a requirement under the Forest Range and Practices Act and is done in accordance with the *Landscape Unit Planning Guide* (MoFR, 1999), and the definition of "priority biodiversity" planning described within. This priority biodiversity planning is the current focus of landscape unit planning and consists of two objectives: "*retention of old growth forest; and stand structure through wildlife tree retention (WTR)*".

The practice of leaving wildlife tree patches (WTPs) will be modelled in the timber supply analysis. WTPs will be modelled by reducing the area harvested, to account for trees that must be left standing in harvested areas. Existing Landscape Unit Plans (LUPs) contain specific WTP recommendations (Table 25). For all other landscape units, and BEC variants not specifically addressed within these plans, a 6% WTP allowance will be applied. Licensees (J. Leblanc, Interfor) have indicated that this is a reasonable reflection of current practice. It should be noted that this allowance will be employed in the Pre-EBM scenario, and outside the EBM zone in the EBM analysis. However, in the EBM analysis, an explicit WTP allowance will not be applied within the EBM zone, as the EBM objectives are deemed to adequately account for this factor.

**Table 25 – WTP allowances in existing LUPs**

| Landscape Unit | BEC Variant | Pre-EBM THLB (ha) | WTP allowance (%) |
|---|---|---|---|
| Malcolm | CWHvm | 3,776 | 10 |
| Lower Nimpkish | CWHxm | 0 | 11 |
| | CWHvm | 0 | 9 |
| | MHmm | 0 | 1 |
| San Josef | CWHvh | 3,733 | 6 |
| | CWHvm | 811 | 10 |
| | MHmm1 | 0 | 1 |
| Sushartie | CWHvh (in SMZ) | 989 | 1 |
| | CWHvh (Outside SMZ) | 614 | 0 |
| Upper Nimpkish | CWHxm | 0 | 13 |
| | CWHmm | 0 | 14 |
| | CWHvm | 23 | 9 |
| | MHmm | 4 | 3 |
| Tsulquate (draft) | CWHvh1 | 1,278 | 2 |
| | CWHvm1 | 3,239 | 4 |
| **Subtotal** | | **14,467** | **5.9%** |
| **Balance of area with no LUP** | | **193,708** | **6.0%** |
| **Total** | | **208,175** | |

### 5.1.19 Timber Licences Reversions

Timber licences and timber agreements are old forms of tenure where the licensee was granted rights to harvest merchantable timber within a specific licence area. These are not currently part of the normal TSA lands managed by the MoFR. However, once these lands have been harvested, reforested, and are designated as free growing they revert back to the TSA. They are included in the THLB, but do not contribute to timber supply until they are harvested and

regenerated. In the context of the Kingcome TSA, any stands identified by licensees as expired, as well as any remaining timber licence areas younger than 50 years are assumed to have already reverted to the TSA. All remaining timber licences will be modelled to return to the TSA according to the reversion period. This is a general assumption, as it is recognized that expiry dates do not necessarily correspond to reversion dates. However, for the purposes of this analysis, this approach is deemed to provide a reasonable approximation. Table 26 provides a summary of all Timber Licence areas identified in the TSA, as well as those yet to be reverted. This information was provided to Timberline by Interfor (G. Sommers).

**Table 26 – Timber licence reversion schedule and new contributions to the THLB**

| Expiry Year | Expired | Unexpired | Unexpired > Age 49[(1)] | Reversion Period |
|---|---|---|---|---|
| 2006 or unknown | 940 | | | |
| 2007 | 4,679 | 694 | 591 | 2007-2011 |
| 2008 | | 5,532 | 2,918 | 2007-2011 |
| 2009 | | 220 | 220 | 2007-2011 |
| 2010 | | 2,653 | 1,042 | 2007-2011 |
| 2012 | | 535 | 15 | 2012-2016 |
| 2013 | | 342 | 104 | 2012-2016 |
| 2015 | | 572 | 199 | 2012-2016 |
| 2016 | | 310 | 93 | 2012-2016 |
| 2030 | | 442 | 218 | 2027-2031 |
| 2031 | | 350 | 149 | 2027-2031 |
| **TSA Total** | **5,619** | **11,650** | **5,549** | |

(1) These areas are assumed to be unreverted and will contribute to the THLB starting in the corresponding reversion period.

## 5.2 EBM THLB Determination

The Pre-EBM analysis will be based on the THLB determined to this point. A number of the objectives associated with the Ministerial Order require additional removals from the THLB. These will serve to further reduce the THLB on which the EBM analysis will be based, and are outlined in the following sections.

### *5.2.1 First Nations Objectives 3-5*

These objectives are designed to protect First Nations values.

#### *5.2.1.1 Objective 3: Traditional forest resources*

1. *"Maintain traditional forest resources in a manner that supports First Nations' food, social and ceremonial use of the forest".*

#### *5.2.1.2 Objective 4: Traditional heritage features*

1. *"Protect traditional heritage features, other than culturally modified trees, and include a management zone of sufficient size to protect the integrity of the traditional heritage feature.*

2. *Despite subsection (1), a traditional heritage feature, other than a culturally modified tree, may be altered or removed after information-sharing or consultation with the applicable First Nation determines whether:*
    a) *the alteration or removal will cause a material adverse impact to the traditional heritage feature that is of continuing importance to the First Nation;*
    b) *the alteration or removal is required for road access, other infrastructure, or to address a safety concern; and*
    c) *there is any practical alternative to the alteration or removal".*

#### *5.2.1.3 Objective 5: Culturally modified trees*

1. *"Protect culturally modified trees, and include a management zone of sufficient size to protect the integrity of the culturally modified tree.*
2. *Despite subsection (1), a culturally modified tree may be altered or harvested after information-sharing or consultation with the applicable First Nation determines whether:*
    a) *the alteration or removal will cause a material adverse impact to the traditional heritage feature that is of continuing importance to the First Nation;*
    b) *the alteration or removal is required for road access, other infrastructure, or to address a safety concern;*
    c) *protection of all of the culturally modified trees in the cutblock would make harvesting the cutblock unviable; and*
    d) *there is any practical alternative to the alteration or removal".*
3. *Reserve culturally modified tree areas, at the landscape level and stand level, where practical, after information-sharing or consultation with the applicable First Nation."*

**Land Base Definition**

It was concluded based on discussions with licensees and First Nations representatives that the areas removed to account for archaeological sites in the pre-EBM scenario would need to be further expanded to address these objectives. To capture this impact, and again respecting the confidential nature of the mapped archaeological information, a further 0.63% aspatial land base reduction was applied to the pre-EBM THLB (Table 27).

**Table 27 – Land base reductions for EBM Objectives 3 - 5**

| Description | Productive Area (ha) | Area Removed (ha) |
|---|---|---|
| **Objectives 3-5** | **4,099** | **1,072** |

#### *5.2.2 Objective 9. High value fish habitat*

1. *"Adjacent to high value fish habitat, maintain a reserve zone with a width, on average, of 1.5 times the height of the dominant trees, and do not alter or harvest the forest in the reserve zones unless there is no practical alternative.*
2. *For the purposes of subsection (1), the width of the reserve zone in any one location may be increased or decreased by up to 0.5 tree heights to address site-specific values, including reserving critical habitat for species at risk.*
3. *Where some or all of the forest within the reserve zone required under subsection (1) has been previously altered or harvested, recruit functional riparian forest in that reserve zone, to the extent possible."*

**Land Base Definition**

High value fish habitat is defined in the MO as "*critical spawning and rearing areas for anadromous and nonanadromous fish*", and includes estuaries, floodplains and marine interface areas. A number of data sources Table 28) were employed which were determined to be the best sources of information to define probable high value fish habitat areas. However, a two-treelength buffer was used (vs. 1.5 as specified in subsection (1)), in order to account for smaller-sized, meandering streams and side channels. Within the buffered areas, a 100% netdown was applied. Areas removed included active low and medium bench active floodplains.

**Table 28 – Land base reductions for EBM Objective 9**

| Description | Productive Area (ha) | Area Removed (ha) |
|---|---|---|
| **Floodplains** | 8,100 | 1,695 |
| **HVFH** | 16,138 | 3,131 |
| **Lfish** | 13,651 | 2,148 |
| **Estu** | 113 | 0 |
| **Est_mo** | 372 | 77 |
| **Total** | **overlapping conditions** | **7,052** |

### *5.2.3 Objective 10. Aquatic habitat that is not high value fish habitat*

1. *"Adjacent to the following aquatic habitat:*
   a) *S1-S3 streams;*
   b) *Lakes greater than 0.25 hectares; and*
   c) *marshes and fen wetlands greater than 0.25 hectare;*

   *retain 90% of the functional riparian forest in a management zone with a width, on average, of 1.5 times the height of the dominant trees".*
2. *The width of the management zone in subsection (1) may be increased or decreased by 0.5 tree lengths in any one location, to address site-specific values, including reserving critical habitat for species at risk.*
3. *Despite subsections (1) and (2), a forest stewardship plan may comply with the provisions for the managements of riparian management areas in accordance with the Forest and Range Practices Act and the regulations made there under, including section 8 of the Forest Planning and Practices Regulation for S1 to S3 streams and for lakes, and marsh and fen wetlands greater than 0.25 hectares.*
4. *Before altering or harvesting the forest described in subsection (3);*
   a) *Ascertain and retain the amount of functional riparian forest sufficient to retain stream bank stability and stream channel integrity;*
   b) *To the extent practical, develop and implement an adaptive management plan and monitor environmental impacts during any primary forestry activity; and*
   c) *Engage in information-sharing or consultation with the applicable First Nation.*
5. *Where some or all of the forest required in subsection (1) has been previously altered or harvested, to the extent practical, recruit functional riparian forest in that management zone or area."*

**Land Base Definition**

Buffers were defined as specified in subsection (1) from TRIM features. A buffer width of 1.35 times tree height was used (0.9 x 1.5). A 100% netdown was applied within these defined riparian buffers (Table 29).

**Table 29 – Land base reductions for EBM Objective 10**

| Description | Productive Area (ha) | Area Removed (ha) |
|---|---|---|
| **Not High Value Fish Habitat** | **30,711** | **1,462** |

### *5.2.4 Objective 11. Forested swamps*

1. *"Adjacent to forested swamps greater than 0.25 hectares, retain 70% of the functional riparian forest in a management zone with a width, on average, equal to 1.5 times the height of the dominant trees.*
2. *For the purposes of subsection (1), the width of the management zone in any one location may be increased or decreased by 0.5 tree lengths, to address site-specific values, including reserving critical habitat for species at risk.*
3. *Despite subsection (1), an additional 10% of the forest in the management zone adjacent to the forested swamp may be altered or harvested where:*
    a) *alteration or removal is required for road access, other infrastructure, or to address a safety concern; or*
    b) *where 70% retention would make harvesting the cutblocks economically unviable.*
4. *Before altering or harvesting the forest pursuant to subsection (3);*
    a) *Ascertain and retain the amount of functional riparian forest sufficient to retain the integrity of the forested swamp;*
    b) *To the extent practical, develop and implement an adaptive management plan and monitor environmental impacts during any primary forestry activity; and*
    c) *Engage in information-sharing or consultation with the applicable First Nation.*
5. *Where some or all of the forest required in subsection (1) has been previously altered or harvested, to the extent practical, recruit functional riparian forest in that management zone or area."*

**Land Base Definition**

A forested swamp as defined in the MO means " a forested mineral wetland or a forested peatland with standing or gently flowing nutrient rich water in pools or channels, and the water table is usually at or near the surface…". Forested swamp buffers were determined from TRIM features as described in the MO. A 100% netdown within these areas within the defined buffer was applied to account for unmapped forest swamps. Potential forested swamp features were restricted to those falling within CWHvm1, CWHws2 and CWHds2 BEC subzones. Swamp features in other subzones were not considered to meet the nutrient rich definition of forested swamps. (Interfor, personal communications). The area removed is listed in Table 30.

**Table 30 – Land base reductions for EBM Objective 11**

| Description | Productive Area (ha) | Area Removed (ha) |
|---|---|---|
| **Forested Swamps** | **1,998** | **209** |

### *5.2.5 Objective 13. Active fluvial units*

1. *"Retain 90% of the functional riparian forest on active fluvial units.*
2. *Despite subsection (1), up to an additional 10% of the forest on an active fluvial unit may be harvested in accordance with subsection (3).*
3. *Before altering or harvesting the functional riparian forest pursuant to subsection (2);*
   a) *Ascertain and retain the amount of functional riparian forest sufficient to retain bank stability and channel integrity on the active fluvial unit;;*
   b) *To the extent practical, develop and implement an adaptive management plan and monitor environmental impacts during any primary forestry activity; and*
   c) *Engage in information-sharing or consultation with the applicable First Nation".*

**Land Base Definition**

An active fluvial unit is defined in the MO as "an active floodplain, where water flows over land in a normal flood event, and includes low and medium benches, and the hydro-geomorphic zone of an active fan". Given this definition, it was concluded that these areas have already been captured within active floodplains (Objective 9).

### *5.2.6 Objective 15. Red-listed and blue-listed plant communities*

1. *"Protect each occurrence of a red-listed plant community during a primary forest activity.*
2. *Despite subsection (1), up to 5% of each occurrence of a red-listed plant community may be disturbed if there is no practical alternative for road access, other infrastructure, or to address a safety concern."*
3. *"Protect at least 70% of each occurrence of a blue-listed plant community in Schedule 5 during a primary forest activity, or protect at least 70% of each type of blue-listed plant community that occurs in a landscape unit".*

**Land Base Definition**

Red-listed plant communities are defined in the MO as "plant communities that are rare, threatened or extirpated in British Columbia". Blue-listed plant communities are defined as "plant communities that are of special concern in British Columbia". The corresponding site series which define these conditions are set out in Schedules 4 and 5 of the MO. As full coverage Terrain Ecosystem Mapping (TEM) is not available for the Kingcome TSA, red and blue-listed plant communities were identified using an approach based on the biophysical model used to predict site index across the TSA. The methodology is documented in the report: "Methods Used to Model Ecosystem Based Management in the Kingcome TSA for Timber Supply Review 3" (Timberline, 2007b), prepared for the Kingcome TSA Stakeholders.

The analysis model predicted the spatial location of site series, which in turn permitted the identification of red and blue-listed plant communities based on Schedules 4 and 5. The site series predictions were compared to existing TEM information where a moderate spatial correlation was evident in areas where TEM mapping was available. Consequently, the approach was deemed to be a reliable surrogate for modelling purposes in the absence of TEM. However, Interfor noted that the land base deletion figure of 13,095 ha for blue-listed species appears to be high, considering that this reduction is the second to last exclusion in a long set of incremental land base netdowns. In addition, operational experience suggests that the correlation in the field is not high.

For the EBM analysis, 100% of the red-listed areas were netted out of the THLB. In addition, a 70% partial netdown was applied to all blue-listed series (Table 31). Red and blue-listed areas include only those stands at least 180 years of age.

**Table 31 – Land base reductions for EBM Objective 15**

| Description | Productive Area (ha) | Area Removed (ha) |
|---|---|---|
| Red listed species | 2,247 | 188 |
| Blue listed species | 48,601 | 13,095 |
| **Total** | **50,848** | **13,283** |

### *5.2.7 Objective 17. Sensitive grizzly bear habitat*

1. *"Maintain sensitive grizzly bear habitat will not cause a material adverse impact to the stability of the sensitive grizzly bear habitat;*
2. *Before altering or harvesting sensitive grizzly bear habitat:*
    a) *Obtain from a registered professional biologist confirmation that the disturbance.*
    b) *To the extent practical, develop and implement an adaptive management plan and monitor the ecological impacts of the proposed forestry development; and*
    c) *Engage in information-sharing or consultation with the applicable First Nation".*

**Land Base Definition**

A 100% netdown was applied to all areas within the most recently defined grizzly habitat zone (Table 32).

**Table 32 – Land base reductions for EBM Objective 17**

| Description | Productive Area (ha) | Area Removed (ha) |
|---|---|---|
| **Grizzly bear habitat** | **14,665** | **3,046** |

# 6.0 INVENTORY AGGREGATION

For the purposes of timber supply analysis the land base is aggregated into management zones and analysis units (AUs). A number of management zones were established previous to the order. These zones are common to both the Pre-EBM and EBM analyses, and therefore THLB area figures for both scenarios are included in the tabular summaries Section 6.1). In addition, several of the EBM objectives require the establishment of management zones to control the rate of harvest and/or retain existing forest cover conditions. These are described in Section 6.2.

## 6.1 Pre-EBM Management Zones

Management zones define geographical units within which specific management guidelines are applied. In the Kingcome TSA, management zones are established to address the following objectives:

- Landscape level biodiversity;
- Vancouver Island Land Use Plan (VILUP) Objectives;
- Visual quality objectives;
- Community watersheds (CWS); and
- Marbled Murrelet nesting habitat.

## 6.2 Landscape Units

Landscape-level biodiversity is managed by ensuring that old-growth targets are maintained across the landscape. To ensure that retained old growth is spatially distributed and represents the full range of natural ecological conditions, these targets are established by landscape unit and biogeoclimatic sub zone and variant. The distribution of TSA land by LU/BEC is shown in Table 33.

**Table 33 – Area by landscape unit and BEC**

| Landscape Unit | | BEC | Total Area (ha) | Prod. Area (ha) | THLB (ha) Pre-EBM | THLB (ha) EBM |
|---|---|---|---|---|---|---|
| No. | Name | | | | | |
| 1 | Ahnuhati-kwalate | CMA unp | 5,489 | 48 | 0 | 0 |
| 1 | Ahnuhati-kwalate | CWH vm 1 | 5,721 | 5,020 | 376 | 309 |
| 1 | Ahnuhati-kwalate | CWH vm 2 | 5,569 | 3,353 | 52 | 44 |
| 1 | Ahnuhati-kwalate | MH mm 1 | 6,906 | 1,366 | 11 | 11 |
| 2 | Ahta | CMA unp | 761 | 10 | 0 | 0 |
| 2 | Ahta | CWH vm 1 | 7,172 | 6,886 | 2,620 | 2,173 |
| 2 | Ahta | CWH vm 2 | 4,645 | 3,589 | 528 | 473 |
| 2 | Ahta | MH mm 1 | 3,798 | 1,266 | 19 | 19 |
| 3 | Allison | CWH vh 1 | 59,044 | 54,263 | 17,184 | 15,764 |
| 4 | Belize | CMA unp | 4,286 | 502 | 0 | 0 |
| 4 | Belize | CWH vh 1 | 15,469 | 14,369 | 5,739 | 5,351 |
| 4 | Belize | CWH vm 1 | 29,408 | 28,403 | 12,939 | 10,745 |
| 4 | Belize | CWH vm 2 | 23,020 | 19,716 | 2,271 | 1,972 |
| 4 | Belize | MH mm 1 | 9,793 | 4,415 | 48 | 46 |

| Landscape Unit | | BEC | Total Area (ha) | Prod. Area (ha) | THLB (ha) Pre-EBM | THLB (ha) EBM |
|---|---|---|---|---|---|---|
| No. | Name | | | | | |
| 5 | Bonanza | CWH vm 1 | 2,514 | 2,225 | 1,168 | 1,168 |
| 5 | Bonanza | CWH vm 2 | 1,983 | 1,801 | 673 | 673 |
| 5 | Bonanza | MH mm 1 | 1,408 | 1,045 | 160 | 160 |
| 6 | Brooks | CWH vh 1 | 7,220 | 5,868 | 0 | 0 |
| 7 | Broughton | CWH vm 1 | 22,384 | 21,194 | 9,915 | 8,342 |
| 8 | Charles | CMA unp | 2,617 | 80 | 0 | 0 |
| 8 | Charles | CWH vm 1 | 5,575 | 5,280 | 2,488 | 2,157 |
| 8 | Charles | CWH vm 2 | 4,134 | 3,157 | 276 | 251 |
| 8 | Charles | MH mm 1 | 3,761 | 1,234 | 2 | 2 |
| 9 | Franklin | CMA unp | 1,153 | 151 | 0 | 0 |
| 9 | Franklin | CWH dm | 610 | 609 | 141 | 138 |
| 9 | Franklin | CWH vm 1 | 0 | 0 | 0 | 0 |
| 9 | Franklin | CWH vm 2 | 856 | 794 | 112 | 105 |
| 9 | Franklin | MH mm 1 | 707 | 489 | 9 | 9 |
| 10 | Fulmore | CWH vm 1 | 209 | 188 | 107 | 93 |
| 10 | Fulmore | CWH vm 2 | 150 | 147 | 13 | 12 |
| 10 | Fulmore | MH mm 1 | 93 | 77 | 8 | 7 |
| 11 | Gilford | CMA unp | 92 | 12 | 0 | 0 |
| 11 | Gilford | CWH vm 1 | 38,530 | 36,314 | 23,816 | 21,269 |
| 11 | Gilford | CWH vm 2 | 7,097 | 6,925 | 3,546 | 3,156 |
| 11 | Gilford | MH mm 1 | 1,717 | 1,555 | 264 | 257 |
| 12 | Holberg | CWH vh 1 | 1,326 | 1,095 | 354 | 354 |
| 12 | Holberg | CWH vm 1 | 4,094 | 3,090 | 1,744 | 1,744 |
| 13 | Huaskin | CWH vh 1 | 22,223 | 21,627 | 11,498 | 10,759 |
| 13 | Huaskin | CWH vm 1 | 15,615 | 15,053 | 8,320 | 6,432 |
| 13 | Huaskin | CWH vm 2 | 2,649 | 2,410 | 517 | 450 |
| 13 | Huaskin | MH mm 1 | 144 | 85 | 1 | 1 |
| 14 | Kakweiken | CMA unp | 5,964 | 200 | 0 | 0 |
| 14 | Kakweiken | CWH vm 1 | 9,084 | 8,272 | 3,156 | 2,445 |
| 14 | Kakweiken | CWH vm 2 | 10,916 | 7,701 | 1,012 | 879 |
| 14 | Kakweiken | MH mm 1 | 10,632 | 2,561 | 63 | 61 |
| 15 | Kashutl | CWH vm 1 | 0 | 0 | 0 | 0 |
| 15 | Kashutl | CWH vm 2 | 9 | 2 | 0 | 0 |
| 15 | Kashutl | MH mm 1 | 5 | 0 | 0 | 0 |
| 16 | Keogh | CWH vm 1 | 5,222 | 908 | 95 | 95 |
| 17 | Klaskish | CWH vh 1 | 15,589 | 14,817 | 4,347 | 4,347 |
| 17 | Klaskish | CWH vm 1 | 1,455 | 1,297 | 250 | 250 |
| 17 | Klaskish | CWH vm 2 | 919 | 752 | 121 | 121 |
| 17 | Klaskish | MH mm 1 | 11 | 7 | 0 | 0 |
| 18 | Knight East | CMA unp | 7,913 | 466 | 0 | 0 |
| 18 | Knight East | CWH dm | 109 | 94 | 44 | 43 |
| 18 | Knight East | CWH vm 1 | 12,825 | 11,582 | 5,984 | 5,113 |
| 18 | Knight East | CWH vm 2 | 8,975 | 7,321 | 1,337 | 1,136 |
| 18 | Knight East | MH mm 1 | 7,944 | 3,866 | 94 | 92 |

| Landscape Unit | | BEC | Total Area (ha) | Prod. Area (ha) | THLB (ha) Pre-EBM | THLB (ha) EBM |
|---|---|---|---|---|---|---|
| No. | Name | | | | | |
| 19 | Lower Kingcome | CMA unp | 12,684 | 1,027 | 19 | 19 |
| 19 | Lower Kingcome | CWH vm 1 | 13,651 | 11,056 | 5,008 | 3,742 |
| 19 | Lower Kingcome | CWH vm 2 | 11,745 | 7,757 | 1,383 | 1,152 |
| 19 | Lower Kingcome | MH mm 1 | 10,303 | 3,043 | 149 | 147 |
| 20 | Lower Klinaklini | CWH vm 1 | 3,182 | 1,105 | 639 | 587 |
| 20 | Lower Klinaklini | CWH vm 2 | 386 | 334 | 81 | 74 |
| 20 | Lower Klinaklini | CWH ws 2 | 613 | 155 | 0 | 0 |
| 20 | Lower Klinaklini | MH mm 1 | 208 | 145 | 1 | 1 |
| 20 | Lower Klinaklini | MH mm 2 | 1,392 | 145 | 0 | 0 |
| 21 | Lower Nimpkish | CMA unp | 2 | 0 | 0 | 5 |
| 21 | Lower Nimpkish | CWH vm 1 | 670 | 78 | 5 | 0 |
| 21 | Lower Nimpkish | CWH vm 2 | 8 | 0 | 0 | 0 |
| 22 | Lull-Sallie | CMA unp | 1,107 | 142 | 0 | 0 |
| 22 | Lull-Sallie | CWH vm 1 | 12,935 | 12,519 | 6,580 | 5,734 |
| 22 | Lull-Sallie | CWH vm 2 | 7,000 | 5,993 | 1,390 | 1,253 |
| 22 | Lull-Sallie | MH mm 1 | 5,501 | 2,732 | 234 | 227 |
| 23 | Mahatta | CWH vh 1 | 12,437 | 11,482 | 6,202 | 6,202 |
| 23 | Mahatta | CWH vm 1 | 2,941 | 2,684 | 1,667 | 1,667 |
| 23 | Mahatta | CWH vm 2 | 1,118 | 1,039 | 476 | 476 |
| 23 | Mahatta | MH mm 1 | 2 | 2 | 0 | 0 |
| 24 | Malcolm | CWH vm 1 | 8,664 | 6,115 | 3,776 | 3,776 |
| 25 | Middle Klinaklini | CMA unp | 42,273 | 14 | 0 | 0 |
| 25 | Middle Klinaklini | CWH ds 2 | 12,555 | 7,440 | 0 | 0 |
| 25 | Middle Klinaklini | CWH ws 2 | 13,530 | 6,319 | 0 | 0 |
| 25 | Middle Klinaklini | ESSFmw | 5,343 | 534 | 0 | 0 |
| 25 | Middle Klinaklini | IDF ww | 659 | 377 | 0 | 0 |
| 25 | Middle Klinaklini | MH mm 2 | 16,617 | 1,177 | 0 | 0 |
| 26 | Miriam | CMA unp | 66 | 8 | 0 | 0 |
| 26 | Miriam | CWH vm 1 | 11,765 | 11,579 | 5,749 | 4,690 |
| 26 | Miriam | CWH vm 2 | 4,416 | 3,818 | 434 | 377 |
| 26 | Miriam | MH mm 1 | 3,413 | 1,895 | 1 | 1 |
| 27 | Nahwitti | CWH vh 1 | 33,595 | 24,026 | 4,016 | 4,016 |
| 27 | Nahwitti | CWH vm 1 | 2,037 | 1,868 | 633 | 633 |
| 28 | Nasparti | CWH vh 1 | 45 | 29 | 1 | 1 |
| 28 | Nasparti | CWH vm 2 | 5 | 2 | 0 | 0 |
| 29 | Neechanz | CWH vm 3 | 22 | 17 | 0 | 0 |
| 29 | Neechanz | MH mm 1 | 1 | 0 | 0 | 0 |
| 30 | Neroutsos | CWH vm 1 | 520 | 11 | 8 | 8 |
| 30 | Neroutsos | CWH vm 2 | 221 | 11 | 1 | 1 |
| 31 | Nigei | CWH vh 1 | 11,307 | 6,932 | 1,647 | 1,646 |
| 32 | San Josef | CWH vh 1 | 29,062 | 24,960 | 3,733 | 3,733 |
| 32 | San Josef | CWH vm 1 | 2,054 | 1,184 | 730 | 730 |
| 32 | San Josef | CWH vm 2 | 180 | 155 | 81 | 81 |
| 33 | Seymour | CMA unp | 12,952 | 234 | 3 | 3 |

| Landscape Unit | | BEC | Total Area (ha) | Prod. Area (ha) | THLB (ha) Pre-EBM | THLB (ha) EBM |
|---|---|---|---|---|---|---|
| No. | Name | | | | | |
| 33 | Seymour | CWH vm 1 | 7,919 | 7,001 | 2,187 | 1,698 |
| 33 | Seymour | CWH vm 2 | 10,007 | 6,423 | 492 | 333 |
| 33 | Seymour | CWH vm 3 | 165 | 125 | 0 | 0 |
| 33 | Seymour | MH mm 1 | 11,656 | 2,897 | 83 | 82 |
| 34 | Shushartie | CWH vh 1 | 15,527 | 13,808 | 1,603 | 1,603 |
| 35 | Sim | CMA unp | 140 | 5 | 0 | 0 |
| 35 | Sim | CWH vm 1 | 887 | 785 | 321 | 282 |
| 35 | Sim | CWH vm 2 | 487 | 446 | 84 | 80 |
| 35 | Sim | MH mm 1 | 460 | 249 | 3 | 3 |
| 36 | Smith Sound | CWH vh 1 | 342 | 302 | 45 | 44 |
| 37 | Smokehouse | CWH vh 1 | 2 | 2 | 0 | 0 |
| 37 | Smokehouse | CWH vm 1 | 40 | 40 | 8 | 7 |
| 37 | Smokehouse | CWH vm 2 | 103 | 93 | 0 | 0 |
| 37 | Smokehouse | MH mm 1 | 38 | 6 | 0 | 0 |
| 38 | Snowdrift | CMA unp | 1,572 | 203 | 0 | 0 |
| 38 | Snowdrift | CWH vm 1 | 21,836 | 20,957 | 12,656 | 10,397 |
| 38 | Snowdrift | CWH vm 2 | 11,304 | 9,489 | 2,642 | 2,299 |
| 38 | Snowdrift | MH mm 1 | 5,328 | 2,403 | 87 | 75 |
| 39 | Stafford | CMA unp | 18 | 0 | 0 | 0 |
| 39 | Stafford | MH mm 1 | 4 | 0 | 0 | 0 |
| 40 | Tahsish | CWH vm 1 | 26 | 0 | 0 | 0 |
| 41 | Tsulquate | CWH vh 1 | 8,817 | 8,152 | 1,278 | 1,278 |
| 41 | Tsulquate | CWH vm 1 | 12,058 | 10,237 | 3,239 | 3,239 |
| 42 | Upper Kingcome | CMA unp | 39,692 | 1,395 | 44 | 44 |
| 42 | Upper Kingcome | CWH vm 1 | 12,544 | 10,006 | 4,309 | 2,620 |
| 42 | Upper Kingcome | CWH vm 2 | 12,963 | 6,992 | 534 | 382 |
| 42 | Upper Kingcome | MH mm 1 | 18,648 | 4,642 | 182 | 166 |
| 43 | Upper Klinaklini | BAFAunp | 11,043 | 13 | 0 | 0 |
| 43 | Upper Klinaklini | CMA unp | 33,201 | 0 | 0 | 0 |
| 43 | Upper Klinaklini | CWH ds 2 | 6,472 | 3,735 | 0 | 0 |
| 43 | Upper Klinaklini | CWH ws 2 | 6,634 | 2,040 | 0 | 0 |
| 43 | Upper Klinaklini | ESSFmw | 14,785 | 1,702 | 0 | 0 |
| 43 | Upper Klinaklini | IDF ww | 10,434 | 6,651 | 0 | 0 |
| 43 | Upper Klinaklini | IMA unp | 14,560 | 8 | 0 | 0 |
| 43 | Upper Klinaklini | MH mm 2 | 8,456 | 166 | 0 | 0 |
| 44 | Upper Nimpkish | CMA unp | 273 | 96 | 0 | 0 |
| 44 | Upper Nimpkish | CWH vm 1 | 713 | 701 | 8 | 8 |
| 44 | Upper Nimpkish | CWH vm 2 | 436 | 407 | 15 | 15 |
| 44 | Upper Nimpkish | MH mm 1 | 501 | 384 | 4 | 4 |
| 45 | Wakeman | CMA unp | 20,842 | 382 | 1 | 1 |
| 45 | Wakeman | CWH vm 1 | 17,777 | 15,105 | 8,369 | 5,740 |
| 45 | Wakeman | CWH vm 2 | 17,388 | 10,606 | 1,725 | 1,453 |
| 45 | Wakeman | MH mm 1 | 20,144 | 5,206 | 89 | 88 |
| 46 | Walker | CWH vh 1 | 1,215 | 1,136 | 101 | 99 |

### 6.2.1 Vancouver Island Land Use Planning Zones

In the year 2000, the Vancouver Island Land Use Plan (VILUP) Higher Level Plan Order was established. This set management objectives for a number of Special Management Zones (SMZ) and Enhanced Forestry Zones (EFZ) on Vancouver Island. SMZ management objectives are designed to sustain forest ecosystem structure and function, requiring the retention of specified forest structural components. EFZ management objectives are designed to increase short-term availability of timber. A number of these zones are found within the Kingcome TSA (Table 34). Minimum forest cover retention objectives (for SMZs) and maximum disturbance objectives (for EFZs) will be applied within these areas.

**Table 34 – VILUP Enhanced and Special Management Zones**

| Type | Name | No. | Total Area (ha) | Prod. Area (ha) | THLB (ha) Pre-EBM | THLB (ha) EBM |
|---|---|---|---|---|---|---|
| Enhanced | San Josef-Koprino | 4 | 16,233 | 13,419 | 4,483 | 4,483 |
| | Holberg | 5 | 4,983 | 4,043 | 2,032 | 2,032 |
| | Keogh-Cluxewe | 6 | 1,777 | 833 | 92 | 92 |
| | Mahatta-Neuroutsos | 8 | 12,382 | 11,010 | 6,318 | 6,318 |
| | Bonanza | 11 | 4,149 | 3,419 | 1,275 | 1,275 |
| **Subtotal** | | | 39,524 | 32,724 | 14,200 | 14,200 |
| Special | Goletas Channel | 1 | 10,619 | 9,826 | 2,030 | 2,030 |
| | W Coast Nawhitti Lowlands | 2 | 695 | 456 | 57 | 57 |
| | Brooks Bay | 3 | 9,896 | 9,473 | 4,212 | 4,212 |
| | Johnstone Strait | 7 | 1,748 | 1,650 | 726 | 726 |
| **Subtotal** | | | **22,958** | **21,405** | **7,025** | **7,025** |
| **Total** | | | **62,482** | **54,129** | **21,225** | **21,225** |

### 6.2.2 Visually Sensitive Areas

Visual quality objectives are achieved by limiting the rate of harvest in areas that are identified as visually sensitive in a Visual Landscape Inventory. Each polygon is assigned a VQO. In the Kingcome TSA, VQOs are applied at the VQO polygon level within the defined Known Scenic Area. Areas outside of these polygons, and outside the VILUP Enhanced Zones were assigned to an Integrated Resource Management (IRM) objective, where only a general maximum disturbance objective was assigned to mimic cutblock adjacency. Table 35 provides a summary of these areas.

**Table 35 – Visually sensitive areas**

| Resource Emphasis Area | Total Area (ha) | Prod. Area (ha) | THLB (ha) Pre-EBM | THLB (ha) EBM |
|---|---|---|---|---|
| Visual Quality – Preservation | 4,976 | 4,493 | 788 | 734 |
| Visual Quality – Retention | 14,446 | 13,749 | 4,512 | 4,243 |
| Visual Quality – Partial Retention | 68,798 | 64,747 | 34,147 | 30,825 |
| Visual Quality – Modification | 6,590 | 5,988 | 3,533 | 3,074 |
| VILUP – Enhanced Zones | 39,524 | 32,724 | 14,200 | 14,200 |
| Integrated Resource Management | 1,038,094 | 528,995 | 150,995 | 129,710 |
| **Total** | **1,172,428** | **650,696** | **208,175** | **182,052** |

### *6.2.3 Community Watersheds*

The Forest Planning and Practices Regulation places limits on harvesting in identified Community Watersheds. There are three such areas within the Kingcome TSA (Table 36), although only one watershed incorporates a significant THLB.

**Table 36 – Community watersheds**

| Community Watershed | Total Area (ha) | Prod. Area (ha) | THLB (ha) Pre-EBM | THLB (ha) EBM |
|---|---|---|---|---|
| Calbick (900.001) | 6 | 6 | 0 | 0 |
| Quaee (900.002) | 377 | 175 | 0 | 0 |
| Tsulquate (920.069) | 4,205 | 3,813 | 760 | 760 |
| **Total** | **4,588** | **3,994** | **760** | **760** |

### *6.2.4 Marbled Murrelet Nesting Habitat*

The March 2006 Notice under Section 7(2) of the FPPR for the North Island Central Coast Forest District requires that the total amount of currently suitable nesting habitat for Marbled Murrelet in the non-contributing land base (as of March 2006) be maintained.

In order to evaluate how much suitable habitat remains in the non-contributing land base the TSR 3 analysis will incorporate coarse scale mapping of potential suitable Marbled Murrelet nesting habitat. Habitat mapping data was based on application of the BC Coast Marbled Murrelet Suitability Model (Chatwin and Mather, 2007). The model was used in that study to estimate the distribution of existing habitat. It was considered a strategic level assessment, and was not supplemented with any photo mapping or low level reconnaissance. The mapping did not consider classes of habitat quality, and stand attributes such as canopy structure and site productivity were not considered. Further, the data used was only current to TSR 2, and therefore the results are somewhat dated.

Portions of these areas are included in the Kingcome TSA, as shown in Table 37. In the analysis, no restrictions will be placed on harvesting within these areas. However, the levels of harvesting within the nesting habitat will be tracked and reported on.

**Table 37 – Marbled murrelet nesting habitat**

| Description | Total Area (ha) | Prod. Area (ha) | THLB (ha) Pre-EBM | THLB (ha) EBM |
|---|---|---|---|---|
| **Nesting habitat** | **161,271** | **150,953** | **75,945** | **63,160** |

## 6.3 EBM Management Zones

In addition to the Pre-EBM management zones described in Section 6.1, the following management zones have been applied to address EBM Objectives 8, 12 and 14.

### *6.3.1 Objective 8. Important fisheries watersheds*

1. *"Maintain equivalent clearcut area < 20% in important fisheries watersheds.*
2. Despite subsection (1), an equivalent clearcut area of more than 20% may be maintained after:
    a) *information-sharing or consultation with the applicable First Nation;*
    b) *A coastal watershed assessment or similar assessment of watershed sensitivity to forest development disturbance is completed to relevant professional standards;*
    c) *Maintaining an amount, type and distribution of forest cover that is sufficient to sustain natural hydrological and fluvial processes, based on the assessment of subsection (2) (b); and*
    d) *To the extent practical, an adaptive management plan is developed and implemented to monitor environmental impacts during any primary forest activity."*

Important fisheries watersheds were identified based on Schedule 2 of the MO. The productive and THLB areas are reported in Table 38.

**Table 38 – Important fisheries watersheds area summary – Objective 8**

| Description | Prod. Area (ha) | THLB (ha) EBM |
|---|---|---|
| **Important fisheries watersheds** | **164,406** | **34,121** |

### *6.3.2 Objective 12. Upland streams*

1. *"For watersheds in Schedule 2 of the MO, maintain 70% or more of the forest, in the portion of the watershed occupied by upland streams, as functional riparian forest.*
2. *For the purposes of subsection (1), allocate retention to include upland stream reaches with unique microclimate or other rare ecological or geomorphological characteristics.*
3. Despite subsection (1), an equivalent clearcut area of more than 20% may be maintained after:
    a) *information-sharing or consultation with the applicable First Nation;*
    b) *A coastal watershed assessment or similar assessment of watershed sensitivity to forest development disturbance is completed to relevant professional standards;*
    c) *Maintaining an amount, type and distribution of forest cover that is sufficient to sustain natural hydrological and fluvial processes, based on the assessment of subsection (3) (b); and*

*d) To the extent practical, an adaptive management plan is developed and implemented to monitor environmental impacts during any primary forest activity.*

**Land Base Definition**

Upland streams are defined in the MO as "streams with slope greater than 5% that are classified as S4 and S6 streams in Section 47 of the Forest Planning and Practices Regulation". For this analysis, these zones were defined as areas within important fisheries zones (Objective 8) which fall above the floodplain, are outside of existing riparian zones. However, for modelling purposes, a 10% slope break was used as it was felt that the resolution of the slope gradient data was too coarse to reliably define a 5% gradient. Within the forested area of the zone, a 30% disturbance constraint will be applied. The zone area is summarized in Table 39.

**Table 39 – Upland streams – Objective 12**

| Description | Prod. Area (ha) | THLB (ha) EBM |
|---|---|---|
| **Upland streams** | **139,663** | **29,756** |

### *6.3.3 Objective 14. Landscape-level biodiversity*

1. *"For landscape units in Schedule 1, retain an amount of old forest equal to or greater than that specified for each site surrogate listed in Schedule 3, except where alteration or removal is required for road access, other infrastructure, or to address a safety concern.*
2. *Where there is less than the old forest in a landscape unit required in subsection (1), to the extent possible recruit forest to meet the representation requirements within 180 years".*
3. *Where the requirement of (2) applies harvesting of old forest is not permitted except where:*
    a. *Alteration or removal is required for road access, other infrastructure, or to address safety concerns; or*
    b. *Information sharing or consultation with First Nations determines there is no practical alternative.*
4. *Maintain, in each landscape unit, less than 50% of each site series surrogate listed in Schedule 3 in mid-seral forest age classes, to the extent practical.*
5. *Where there is more than 50% of any site series surrogate listed in Schedule 3 in mid-seral forest age classes in any landscape unit, then reduce the mid-seral forest age classes in that site series surrogate in that landscape unit to less than 50% within 80 years, to the extent practical.*
6. *To the extent practical, include within old forest retention areas, habitat elements important for species at risk, ungulate winter range, regionally important wildlife, including:*
    c. *Mountain goats;*
    d. *Grizzly bears;*
    e. *Northern goshawks;*
    f. *Tailed frogs, and*
    g. *Marbled murrelets.*

**Land Base Definition**

The provincial BEC coverage was overlaid with the Kingcome TSA VRI coverage (with adjusted site indices) to assign site series surrogates (SSS) (unique BEC/AU combinations) to the land base;

These site series surrogates (BEC/AU) will then be used to apply old growth representation targets as defined in the MO. In this case, AU definitions differ from those used in this analysis to model stand growth. The definitions are included in Table 40.

**Table 40 – AU definitions for site series surrogate (SSS) definitions – Objective 12**

| AU | Description | Criteria |
|---|---|---|
| 1 | Fir - Good | ITG 1-8, SI >27 |
| 2 | Fir - Medium | ITG 1-8, SI 21-27 |
| 3 | Fir - Poor | ITG 1-8, SI <=20 |
| 4 | Cedar - Good | ITG 9-11, SI >23 |
| 5 | Cedar - Medium | ITG 9-11, SI 16-23 |
| 6 | Cedar - Poor | ITG 9-11, SI <=15 |
| 7 | HemBal - Good | ITG 12-20, SI >22 |
| 8 | HemBal - Medium | ITG 12-20, SI 12.6-22 |
| 9 | HemBal - Poor | ITG 12-20, SI <=12.5 |
| 10 | Spruce - Good | ITG 21-26, SI >22 |
| 11 | Spruce - Medium | ITG 21-26, SI 16-22 |
| 12 | Spruce/Pine - Poor | SI <= 15, Pine ITG 21-34, All SI |
| 13 | Deciduous - All | ITG 35-42, SI all |

## 6.4 Analysis Unit Definitions

To reduce the complexity and volume of information used and generated in timber supply models, individual stands may be aggregated into fewer, larger and more or less homogeneous analysis units. Analysis units are usually comprised of combinations of stands with similar tree species, timber growing capability (site index), silvicultural management regimes, and in some cases management objectives.

Yield tables representing the growth of trees on each polygon within the analysis unit are combined to represent average growth of stands on the unit. Yield tables for current and future stands are developed using this approach. Analysis units are formed in order to track growth characteristics of similar stands.

The definition of analysis units originated from the Kingcome TSA TSR 2 analysis, with modifications after a series of TSA licensee and MOFR regional and district reviews. Changes from TSR 2 include:

- New aspen/cottonwood (Act) analysis unit, to incorporate all Act leading stands in the inventory.
- New Fdc planted zone[(1)], used to convert existing analysis units to a future regime planted to Fdc.
- New marginal cedar and hemlock analysis units added to separate low site conditions.

- Analysis units divided by EBM management zone, to provide for subsequent flexibility with different yield table generation parameters under EBM management scenarios.

[(1)]Fdc is being planted as a leading component in the southern most part of the TSA and on south facing slopes, warranting its inclusion as part of the analysis unit definition. Interfor spatially identified these areas on a map, which was used to define the Fdc planted zone. Modelling assumptions within this Fdc planted zone were subsequently clarified with MoFR and Interfor, and it was agreed that all existing non-Fdc leading stands inside the Fdc planted zone would be directed to a future planted Fdc managed stand yield table (MSYT).

The same analysis unit designations and numbering conventions were employed in both the pre-EBM and EBM runs. However, for the EBM scenario, an additional high stand retention EBM zone was defined based on VQO preservation and retention designations. Analysis units within this area were split out and assigned separate designations.

Analysis unit definitions are summarized in Table 41. EBM high retention analysis units include "VQO" in the AU description.

**Table 41 – Analysis unit definitions for existing and regenerated stands**

| Current AU | Future AU | THLB (ha) Pre-EBM | THLB (ha) EBM | AU Description | Leading Species | Inv SI Range | EBM Zone | Fdc Plant Zone | Era |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 201 | 224 | 224 | CW-GOOD | Cw,Yc | >=20 | Out | Out | Exist Natural |
| 2 | 202 | 690 | 690 | CW-MED | Cw,Yc | 15-19.9 | Out | Out | Exist Natural |
| 3 | 203 | 6,410 | 6,410 | CW-POOR | Cw,Yc | 11.6-14.9 | Out | Out | Exist Natural |
| 4 | 204 | 1,927 | 1,927 | HW/BA-GOOD | Hwc,Hm,Ba | >=25 | Out | Out | Exist Natural |
| 5 | 205 | 1,406 | 1,406 | HW/BA-MED | Hwc,Hm,Ba | 20-24.9 | Out | Out | Exist Natural |
| 6 | 206 | 4,739 | 4,739 | HW/BA-POOR | Hwc,Hm,Ba | 13.6-19.9 | Out | Out | Exist Natural |
| 7 | 207 | 270 | 270 | SS | Ss | All | Out | Out | Exist Natural |
| 8 | 208 | 385 | 385 | DR | Dr,Mb | All | Out | Out | Exist Natural |
| 10 | 210 | 107 | 107 | FDC | Fdc | All | Out | In | Exist Natural |
| 11 | 211 | 1,760 | 1,613 | CW-GOOD-EBM | Cw,Yc | >=20 | In | Out | Exist Natural |
| 12 | 212 | 16,726 | 12,929 | CW-MED-EBM | Cw,Yc | 15-19.9 | In | Out | Exist Natural |
| 13 | 213 | 50,930 | 40,701 | CW-POOR-EBM | Cw,Yc | 11.6-14.9 | In | Out | Exist Natural |
| 14 | 214 | 8,825 | 7,454 | HW/BA-GOOD-EBM | Hwc,Hm,Ba | >=25 | In | Out | Exist Natural |
| 15 | 215 | 8,896 | 7,579 | HW/BA-MED-EBM | Hwc,Hm,Ba | 20-24.9 | In | Out | Exist Natural |
| 16 | 216 | 16,585 | 12,282 | HW/BA-POOR-EBM | Hwc,Hm,Ba | 13.6-19.9 | In | Out | Exist Natural |
| 17 | 217 | 572 | 125 | SS-EBM | Ss | All | In | Out | Exist Natural |
| 18 | 218 | 4,680 | 3,227 | DR-EBM | Dr,Mb | All | In | Out | Exist Natural |
| 19 | 219 | 603 | 93 | ACT-EBM | Act | All | In | Out | Exist Natural |
| 20 | 220 | 801 | 416 | FDC-EBM | Fdc | All | In | In | Exist Natural |
| 21 | 221 | | 37 | CW-GOOD-EBM-VQO | Cw,Yc | >=20 | In | Out | Exist Natural |
| 22 | 222 | | 512 | CW-MED-EBM-VQO | Cw,Yc | 15-19.9 | In | Out | Exist Natural |
| 23 | 223 | | 1,136 | CW-POOR-EBM-VQO | Cw,Yc | 11.6-14.9 | In | Out | Exist Natural |
| 24 | 224 | | 470 | HW/BA-GOOD-EBM-VQO | Hwc,Hm,Ba | >=25 | In | Out | Exist Natural |
| 25 | 225 | | 503 | HW/BA-MED-EBM-VQO | Hwc,Hm,Ba | 20-24.9 | In | Out | Exist Natural |
| 26 | 226 | | 1,333 | HW/BA-POOR-EBM-VQO | Hwc,Hm,Ba | 13.6-19.9 | In | Out | Exist Natural |
| 27 | 227 | | 16 | SS-EBM-VQO | Ss | All | In | Out | Exist Natural |

| Current AU | Future AU | THLB (ha) Pre-EBM | THLB (ha) EBM | AU Description | Leading Species | Inv SI Range | EBM Zone | Fdc Plant Zone | Era |
|---|---|---|---|---|---|---|---|---|---|
| 28 | 228 | | 113 | DR-EBM-VQO | Dr,Mb | All | In | Out | Exist Natural |
| 30 | 230 | | 338 | FDC-EBM-VQO | Fdc | All | In | In | Exist Natural |
| 32 | 232 | 67 | 67 | CW-MED-TOFDC | Cw,Yc | 15-19.9 | Out | In | Exist Natural |
| 33 | 233 | 104 | 104 | CW-POOR-TOFDC | Cw,Yc | 11.6-14.9 | Out | In | Exist Natural |
| 34 | 234 | 22 | 22 | HW/BA-GOOD-TOFDC | Hwc,Hm,Ba | >=25 | Out | In | Exist Natural |
| 35 | 235 | 133 | 133 | HW/BA-MED-TOFDC | Hwc,Hm,Ba | 20-24.9 | Out | In | Exist Natural |
| 36 | 236 | 631 | 631 | HW/BA-POOR-TOFDC | Hwc,Hm,Ba | 13.6-19.9 | Out | In | Exist Natural |
| 38 | 238 | 7 | 7 | DR-TOFDC | Dr,Mb | All | Out | In | Exist Natural |
| 42 | 242 | 294 | 229 | CW-MED-TOFDC-EBM | Cw,Yc | 15-19.9 | In | In | Exist Natural |
| 43 | 243 | 778 | 614 | CW-POOR-TOFDC-EBM | Cw,Yc | 11.6-14.9 | In | In | Exist Natural |
| 44 | 244 | 282 | 264 | HW/BA-GOOD-TOFDC-EBM | Hwc,Hm,Ba | >=25 | In | In | Exist Natural |
| 45 | 245 | 387 | 290 | HW/BA-MED-TOFDC-EBM | Hwc,Hm,Ba | 20-24.9 | In | In | Exist Natural |
| 46 | 246 | 941 | 585 | HW/BA-POOR-TOFDC-EBM | Hwc,Hm,Ba | 13.6-19.9 | In | In | Exist Natural |
| 47 | 247 | 36 | 7 | SS-TOFDC-EBM | Ss | All | In | In | Exist Natural |
| 48 | 248 | 146 | 95 | DR-TOFDC-EBM | Dr,Mb | All | In | In | Exist Natural |
| 49 | 249 | 5 | 0 | ACT-TOFDC-EBM | Act | All | In | In | Exist Natural |
| 52 | 252 | | 4 | CW-MED-TOFDC-EBM-VQO | Cw,Yc | 15-19.9 | In | In | Exist Natural |
| 53 | 253 | | 31 | CW-POOR-TOFDC-EBM-VQO | Cw,Yc | 11.6-14.9 | In | In | Exist Natural |
| 55 | 255 | | 78 | HW/BA-MED-TOFDC-EBM-VQO | Hwc,Hm,Ba | >=25 | In | In | Exist Natural |
| 56 | 256 | | 231 | HW/BA-POOR-TOFDC-EBM-VQO | Hwc,Hm,Ba | 20-24.9 | In | In | Exist Natural |
| 57 | 257 | | 15 | SS-TOFDC-EBM-VQO | Hwc,Hm,Ba | 13.6-19.9 | In | In | Exist Natural |
| 58 | 258 | | 1 | DR-TOFDC-EBM-VQO | Ss | All | In | In | Exist Natural |
| 61 | 261 | 2,495 | 2,495 | CW-MARG | Cw,Yc | <=11.5 | Out | Out | Exist Natural |
| 62 | 262 | 2,298 | 2,298 | HW/BA-MARG | Hwc,Hm,Ba | <=13.5 | Out | Out | Exist Natural |
| 63 | 263 | 14,252 | 11,889 | CW-MARG-EBM | Cw,Yc | <=11.5 | In | Out | Exist Natural |
| 64 | 264 | 5,740 | 4,148 | HW/BA-MARG-EBM | Hwc,Hm,Ba | <=13.5 | In | Out | Exist Natural |
| 65 | 265 | | 185 | CW-MARG-EBM-VQO | Cw,Yc | <=11.5 | In | Out | Exist Natural |
| 66 | 266 | | 333 | HW/BA-MARG-EBM-VQO | Hwc,Hm,Ba | <=13.5 | In | Out | Exist Natural |

| Current AU | Future AU | THLB (ha) Pre-EBM | THLB (ha) EBM | AU Description | Leading Species | Inv SI Range | EBM Zone | Fdc Plant Zone | Era |
|---|---|---|---|---|---|---|---|---|---|
| 67 | 267 | 65 | 65 | CW-MARG-TOFDC | Cw,Yc | <=11.5 | Out | In | Exist Natural |
| 68 | 268 | 139 | 139 | HW/BA-MARG-TOFDC | Hwc,Hm,Ba | <=13.5 | Out | In | Exist Natural |
| 69 | 269 | 143 | 124 | CW-MARG-TOFDC-EBM | Cw,Yc | <=11.5 | In | In | Exist Natural |
| 70 | 270 | 236 | 157 | HW/BA-MARG-TOFDC-EBM | Hwc,Hm,Ba | <=13.5 | In | In | Exist Natural |
| 72 | 272 | | 41 | HW/BA-MARG-TOFDC-EBM-VQO | Hwc,Hm,Ba | <=13.5 | In | In | Exist Natural |
| 101 | 301 | 2,894 | 2,894 | CW-GOOD | Cw,Yc | >=20 | Out | Out | Exist Managed |
| 102 | 302 | 322 | 322 | CW-MED | Cw,Yc | 15-19.9 | Out | Out | Exist Managed |
| 103 | 303 | 6 | 6 | CW-POOR | Cw,Yc | 11.6-14.9 | Out | Out | Exist Managed |
| 104 | 304 | 1,345 | 1,345 | HW/BA-GOOD | Hwc,Hm,Ba | >=25 | Out | Out | Exist Managed |
| 105 | 305 | 7,263 | 7,263 | HW/BA-MED | Hwc,Hm,Ba | 20-24.9 | Out | Out | Exist Managed |
| 106 | 306 | 119 | 119 | HW/BA-POOR | Hwc,Hm,Ba | 13.6-19.9 | Out | Out | Exist Managed |
| 107 | 307 | 813 | 813 | SS | Ss | All | Out | Out | Exist Managed |
| 108 | 308 | 161 | 161 | DR | Dr,Mb | All | Out | Out | Exist Managed |
| 111 | 311 | 7,647 | 7,161 | CW-GOOD-EBM | Cw,Yc | >=20 | In | Out | Exist Managed |
| 112 | 312 | 1,708 | 1,637 | CW-MED-EBM | Cw,Yc | 15-19.9 | In | Out | Exist Managed |
| 113 | 313 | 366 | 358 | CW-POOR-EBM | Cw,Yc | 11.6-14.9 | In | Out | Exist Managed |
| 114 | 314 | 2,471 | 2,239 | HW/BA-GOOD-EBM | Hwc,Hm,Ba | >=25 | In | Out | Exist Managed |
| 115 | 315 | 11,080 | 10,217 | HW/BA-MED-EBM | Hwc,Hm,Ba | 20-24.9 | In | Out | Exist Managed |
| 116 | 316 | 799 | 759 | HW/BA-POOR-EBM | Hwc,Hm,Ba | 13.6-19.9 | In | Out | Exist Managed |
| 117 | 317 | 10 | 8 | SS-EBM | Ss | All | In | Out | Exist Managed |
| 118 | 318 | 992 | 838 | DR-EBM | Dr,Mb | All | In | Out | Exist Managed |
| 119 | 319 | 31 | 0 | ACT-EBM | Act | All | In | Out | Exist Managed |
| 120 | 320 | 109 | 68 | FDC-EBM | Fdc | All | In | In | Exist Managed |
| 121 | 321 | | 62 | CW-GOOD-EBM-VQO | Cw,Yc | >=20 | In | Out | Exist Managed |
| 122 | 322 | | 1 | CW-MED-EBM-VQO | Cw,Yc | 15-19.9 | In | Out | Exist Managed |
| 124 | 324 | | 9 | HW/BA-GOOD-EBM-VQO | Hwc,Hm,Ba | >=25 | In | Out | Exist Managed |
| 125 | 325 | | 75 | HW/BA-MED-EBM-VQO | Hwc,Hm,Ba | 20-24.9 | In | Out | Exist Managed |
| 128 | 328 | | 2 | DR-EBM-VQO | Dr,Mb | All | In | Out | Exist Managed |

| Current AU | Future AU | THLB (ha) Pre-EBM | THLB (ha) EBM | AU Description | Leading Species | Inv SI Range | EBM Zone | Fdc Plant Zone | Era |
|---|---|---|---|---|---|---|---|---|---|
| 131 | 331 | 66 | 66 | CW-GOOD-TOFDC | Cw,Yc | >=20 | Out | In | Exist Managed |
| 132 | 332 | 36 | 36 | CW-MED-TOFDC | Cw,Yc | 15-19.9 | Out | In | Exist Managed |
| 135 | 335 | 105 | 105 | HW/BA-MED-TOFDC | Hwc,Hm,Ba | 20-24.9 | Out | In | Exist Managed |
| 141 | 341 | 243 | 224 | CW-GOOD-TOFDC-EBM | Cw,Yc | =20 | In | In | Exist Managed |
| 144 | 344 | 159 | 136 | HW/BA-GOOD-TOFDC-EBM | Hwc,Hm,Ba | >=25 | In | In | Exist Managed |
| 145 | 345 | 509 | 457 | HW/BA-MED-TOFDC-EBM | Hwc,Hm,Ba | 20-24.9 | In | In | Exist Managed |
| 146 | 346 | 1 | 1 | HW/BA-POOR-TOFDC-EBM | Hwc,Hm,Ba | 13.6-19.9 | In | In | Exist Managed |
| 147 | 347 | 21 | 1 | SS-TOFDC-EBM | Ss | All | In | In | Exist Managed |
| 148 | 348 | 23 | 2 | DR-TOFDC-EBM | Dr,Mb | All | In | In | Exist Managed |
| 151 | 351 |  | 4 | CW-GOOD-TOFDC-EBM-VQO | Cw,Yc | =20 | In | In | Exist Managed |
| 154 | 354 |  | 15 | HW/BA-GOOD-TOFDCEBM-VQO | Hwc,Hm,Ba | >=25 | In | In | Exist Managed |
| 155 | 355 |  | 17 | HW/BA-MED-TOFDC-EBM-VQO | Hwc,Hm,Ba | 20-24.9 | In | In | Exist Managed |
| 158 | 358 |  | 18 | DR-TOFDC-EBM-VQO | Dr,Mb | All | In | In | Exist Managed |
| 162 | 362 | 45 | 45 | HW/BA-MARG | Cw,Yc | <=13.5 | Out | Out | Exist Managed |
| 163 | 363 | 95 | 94 | CW-MARG-EBM | Hwc,Hm,Ba | <=11.5 | In | Out | Exist Managed |
| 164 | 364 | 38 | 33 | HW/BA-MARG-EBM | Cw,Yc | <=13.5 | In | Out | Exist Managed |
| 167 | 367 | 26 | 26 | CW-MARG-TOFDC | Hwc,Hm,Ba | <=11.5 | Out | In | Exist Managed |
| 401 | 601 | 10 | 10 | CW-GOOD | Cw,Yc | >=20 | Out | Out | NSR |
| 402 | 602 | 296 | 296 | CW-MED | Cw,Yc | 15-19.9 | Out | Out | NSR |
| 403 | 603 | 2,056 | 2,056 | CW-POOR | Cw,Yc | 11.6-14.9 | Out | Out | NSR |
| 404 | 604 | 147 | 147 | HW/BA-GOOD | Hwc,Hm,Ba | >=25 | Out | Out | NSR |
| 405 | 605 | 93 | 93 | HW/BA-MED | Hwc,Hm,Ba | 20-24.9 | Out | Out | NSR |
| 406 | 606 | 3 | 3 | HW/BA-POOR | Hwc,Hm,Ba | 13.6-19.9 | Out | Out | NSR |
| 410 | 610 | 28 | 28 | FDC | Fdc | All | Out | In | NSR |
| 411 | 611 | 274 | 241 | CW-GOOD-EBM | Cw,Yc | >=20 | In | Out | NSR |
| 412 | 612 | 860 | 816 | CW-MED-EBM | Cw,Yc | 15-19.9 | In | Out | NSR |
| 413 | 613 | 7,699 | 7,008 | CW-POOR-EBM | Cw,Yc | 11.6-14.9 | In | Out | NSR |
| 414 | 614 | 539 | 500 | HW/BA-GOOD-EBM | Hwc,Hm,Ba | >=25 | In | Out | NSR |

| Current AU | Future AU | THLB (ha) Pre-EBM | THLB (ha) EBM | AU Description | Leading Species | Inv SI Range | EBM Zone | Fdc Plant Zone | Era |
|---|---|---|---|---|---|---|---|---|---|
| 415 | 615 | 273 | 263 | HW/BA-MED-EBM | Hwc,Hm,Ba | 20-24.9 | In | Out | NSR |
| 416 | 616 | 171 | 157 | HW/BA-POOR-EBM | Hwc,Hm,Ba | 13.6-19.9 | In | Out | NSR |
| 419 | 619 | 14 | 0 | ACT-EBM | Act | All | In | Out | NSR |
| 420 | 620 | 198 | 185 | FDC-EBM | Fdc | All | In | In | NSR |
| 421 | 621 | | 18 | CW-GOOD-EBM-VQO | Cw,Yc | >=20 | In | Out | NSR |
| 422 | 622 | | 20 | CW-MED-EBM-VQO | Cw,Yc | 15-19.9 | In | Out | NSR |
| 423 | 623 | | 28 | CW-POOR-EBM-VQO | Cw,Yc | 11.6-14.9 | In | Out | NSR |
| 424 | 624 | | 4 | HW/BA-GOOD-EBM-VQO | Hwc,Hm,Ba | >=25 | In | Out | NSR |
| 461 | 661 | 2 | 2 | CW-MARG | Cw,Yc | <=11.5 | Out | Out | NSR |
| 462 | 662 | 6 | 6 | HW/BA-MARG | Hwc,Hm,Ba | <=13.5 | Out | Out | NSR |
| 463 | 663 | 57 | 42 | CW-MARG-EBM | Cw,Yc | <=11.5 | In | Out | NSR |
| 464 | 664 | 211 | 177 | HW/BA-MARG-EBM | Hwc,Hm,Ba | <=13.5 | In | Out | NSR |
| **Total** | | **208,175** | **182,052** | | | | | | |

## 6.5 Age Class Distributions

Area and volume summaries by age class are summarized in Tables 42 and 43.

**Table 42 – Area by age class**

| Age Range | Area (ha) | | | |
|---|---|---|---|---|
| | **Total** | **Productive** | **THLB Pre-EBM** | **THLB EBM** |
| 0 | 363,605 | 16,110 | 12,634 | 11,848 |
| 1-20 | 34,284 | 31,538 | 23,305 | 22,493 |
| 21-40[(1)] | 29,157 | 26,302 | 16,429 | 15,369 |
| 41-60 | 36,022 | 31,840 | 13,683 | 12,453 |
| 61-80 | 38,104 | 33,250 | 12,805 | 11,854 |
| 81-100 | 28,161 | 23,429 | 5,640 | 4,731 |
| 101-120 | 35,195 | 26,656 | 6,767 | 5,870 |
| 121-140 | 16,785 | 11,799 | 2,887 | 2,496 |
| 141-250 | 179,715 | 109,443 | 21,500 | 18,484 |
| 251+ | 411,400 | 340,329 | 92,525 | 76,454 |
| **Total** | **1,172,428** | **650,696** | **208,175** | **182,052** |

**Table 43 – Coniferous volume by age class**

| Age Range | Volume (1000 $m^3$) | | | |
|---|---|---|---|---|
| | **Total** | **Productive** | **THLB Pre-EBM** | **THLB EBM** |
| 0 | 0 | 1 | 1 | 1 |
| 1-20 | 31 | 28 | 15 | 15 |
| 21-40 | 767 | 643 | 396 | 360 |
| 41-60 | 6,788 | 6,376 | 3,624 | 3,392 |
| 61-80 | 11,730 | 11,164 | 5,557 | 5,194 |
| 81-100 | 8,128 | 7,580 | 2,939 | 2,624 |
| 101-120 | 10,092 | 9,607 | 4,183 | 3,858 |
| 121-140 | 5,024 | 4,748 | 1,789 | 1,624 |
| 141-250 | 56,693 | 53,120 | 13,719 | 11,826 |
| 251+ | 171,366 | 160,998 | 57,517 | 47,036 |
| **Total** | **270,619** | **254,265** | **89,740** | **75,930** |

# 7.0 GROWTH AND YIELD

This section describes the issues, information sources, assumptions, methods, and any relevant processing or adjustments related to growth and yield estimates for existing and future stands.

## 7.1 Inventory

The Forest cover inventory was received from the MoFR January 1, 2006, with age and height attributes projected to this date. Both age and height attributes included in this inventory originate from the VRI Phase 2 adjustment process.[2]

In assigning analysis units based on inventory attributes, the following assumptions were made:

- Leading species (as opposed to inventory type group) was used to define analysis units, due to the inventory coverage data discrepancy between ITG and leading species labels.
- If previous stand attribute data were available, the previous stand attributes were used to assign analysis units using a combination of leading species, age, height and stocking classes to assign broad good, medium, and poor site classes. (assigned to NSR)
- If no previous stand attribute data was available, the dominant analysis unit in a given BEC subzone was used to assign an equivalent analysis unit to each stand occurring in the same BEC subzone. (assigned to NSR)
- In some cases, the combination of age, height, and inventory site index from the current VRI was considered questionable (*ie*., height 1.3m, age 250yrs). For these stands, the current inventory attributes were ignored, and the stands were assumed to be NSR. No change was made to the analysis unit assignment.

## 7.2 Natural Stand Yield Tables.

Natural stand yield tables (NSYT) were developed using the MoFR program Variable Density Yield Prediction Model (VDYP Batch version 6.6D). Phase 2 adjusted age and height attributes were used as inputs to the natural stand yield tables, and the volume adjustment factor (also included in the inventory) was used as a multiplier to all natural stand yield tables.

Individual NSYTs were generated for all existing natural stands by forest cover polygon, and then aggregated by analysis unit. For the Cottonwood leading (Act) analysis unit, VDYP version 7 for the NSYT was approved by the MOFR. [3]

## 7.3 Managed Stand Yield Tables

Managed stand yield tables used the MoFR Table Interpolation Program for Stand Yields (TIPSY Batch version 4.1) growth model. Individual MSYTs were generated for all existing and future managed stands by forest cover polygon, and then aggregated by analysis unit.

The managed yield curves for alder reported in this Data Package have been developed using TIPSY. However, Northwest Hardwoods staff has expressed concern that these yields appear

[2] Confirmed via email from T.Salkeld, MoFR, June 20, 2007.

[3] VDYP version 7 was used for the Act analysis unit with the approval of J. Brown, MoFR. This same NSYT was used for both current and future analysis units.

very conservative when compared to data from the Pacific Northwest Hardwood Cooperative, and yield curves developed with TASS. This issue will be explored further prior to finalizing yield curve tables for alder analysis units.

## 7.4 Site Index

Site Index is a measure of productivity used during yield analysis. SI is an estimate of potential height growth on a site over a fixed period of time, normally 50 years breast height age. The productivity of a site largely determines how quickly trees grow and when rotation age and minimum harvest age (MHA) are reached. The inventory site index from the forest inventory coverage is used to develop yield tables for existing natural stands.

Adjusted site index has been used to develop yield tables for future managed stands. The derivation of these site indices is described in the report *Site Index Adjustment of the Kingcome Timber Supply Area*. (Timberline, 2007a).

The Kingcome SIA project was completed in three major steps:

1. Preliminary potential site index (PSI) was estimated for western red cedar (Cw) and western hemlock (Hw) using the TNRG biophysical model.
2. Field sampling was completed to estimate PSI of Cw and Hw from height and age measurements of site trees in randomly located points, in suitable second-growth stands.
3. The preliminary PSI estimates were statistically adjusted using the sample data to remove potential bias from the predicted PSI estimates.

Both Cw and Hw predicted PSI were adjusted using the ratio of means method. The Cw preliminary PSI estimates showed almost no bias (less than 1%), while the Hw bias was approximately 2.4%. The relationship between preliminary PSI and ground site index was relatively strong. The coefficient of determination ($R^2$) was 20-30%, while the 95% sampling error was relatively low (1.2 m) for Cw, and slightly higher than the targeted ±1.5 m (1.7 m) for Hw.

The adjusted PSI estimates were higher than current inventory site index estimates in areas where Cw and Hw are currently the leading species. The differences were approximately 4.2 m (or 30%) for Cw and 3.2 m (or 15%) for Hw. This site index increase should increase mean annual increment estimates on the TSA by 60% for Cw stands and 30% for Hw stands in timber supply analysis.

The following rules were used to assign adjusted site index to each record for existing managed and future managed stands:

- For Cw and Hw analysis units, adjusted site indices were used where available.[4] Where adjusted site indices were not generated, inventory site index was used.
- For Cw and Hw analysis units that converted to future Fdc analysis units, MoFR site index conversion equations were used to convert from either Cw or Hw to Fdc site index.
- For all other analysis units, inventory site index was used.

For the Act analysis unit, a single average site index was computed from all stands, using a minimum SI of 25m.[5] Table 44 lists the weighted average site index assigned to all existing and future analysis units.

[4] The site index adjusted area included all operable schedule C vegetated lands in the CWH, as defined in the site index adjustment report.

**Table 44 – Site index values for present and future stands**

| Current AU | Current AU Description | Future AU | Pre-EBM | | EBM | |
|---|---|---|---|---|---|---|
| | | | Present SI | Future SI | Present SI | Future SI |
| 1 | CW-GOOD | 201 | 24.3 | 17.6 | 24.3 | 17.6 |
| 2 | CW-MED | 202 | 16.7 | 20.1 | 16.7 | 20.1 |
| 3 | CW-POOR | 203 | 12.7 | 20.6 | 12.7 | 20.6 |
| 4 | HW/BA-GOOD | 204 | 27.4 | 24.0 | 27.4 | 24.0 |
| 5 | HW/BA-MED | 205 | 22.4 | 22.4 | 22.4 | 22.4 |
| 6 | HW/BA-POOR | 206 | 15.6 | 21.5 | 15.6 | 21.5 |
| 7 | SS | 207 | 18.6 | 20.7 | 18.6 | 20.7 |
| 8 | DR | 208 | 23.2 | 22.5 | 23.2 | 22.5 |
| 10 | FDC | 210 | 31.5 | 31.5 | 31.5 | 31.5 |
| 11 | CW-GOOD-EBM | 211 | 22.8 | 19.5 | 22.8 | 19.5 |
| 12 | CW-MED-EBM | 212 | 16.5 | 18.5 | 16.5 | 18.6 |
| 13 | CW-POOR-EBM | 213 | 13.0 | 19.0 | 13.0 | 19.0 |
| 14 | HW/BA-GOOD-EBM | 214 | 27.7 | 25.3 | 27.7 | 25.2 |
| 15 | HW/BA-MED-EBM | 215 | 22.6 | 22.7 | 22.6 | 22.8 |
| 16 | HW/BA-POOR-EBM | 216 | 16.3 | 20.6 | 16.3 | 20.8 |
| 17 | SS-EBM | 217 | 20.1 | 21.4 | 17.9 | 19.6 |
| 18 | DR-EBM | 218 | 24.5 | 23.6 | 23.6 | 22.8 |
| 19 | ACT-EBM | 219 | 28.7 | 29.5 | 23.9 | 27.1 |
| 20 | FDC-EBM | 220 | 24.9 | 24.9 | 25.5 | 25.5 |
| 21 | CW-GOOD-EBM-VQO | 221 | | | 24.9 | 20.2 |
| 22 | CW-MED-EBM-VQO | 222 | | | 16.3 | 17.2 |
| 23 | CW-POOR-EBM-VQO | 223 | | | 13.1 | 17.9 |
| 24 | HW/BA-GOOD-EBM-VQO | 224 | | | 28.0 | 26.0 |
| 25 | HW/BA-MED-EBM-VQO | 225 | | | 22.6 | 21.6 |
| 26 | HW/BA-POOR-EBM-VQO | 226 | | | 17.0 | 18.5 |
| 27 | SS-EBM-VQO | 227 | | | 18.8 | 18.8 |
| 28 | DR-EBM-VQO | 228 | | | 26.3 | 24.5 |
| 30 | FDC-EBM-VQO | 230 | | | 24.2 | 24.2 |
| 32 | CW-MED-TOFDC | 232 | 15.8 | 15.8 | 15.8 | 15.8 |
| 33 | CW-POOR-TOFDC | 233 | 11.9 | 11.9 | 11.9 | 11.9 |
| 34 | HW/BA-GOOD-TOFDC | 234 | 26.5 | 26.5 | 26.5 | 26.5 |
| 35 | HW/BA-MED-TOFDC | 235 | 23.4 | 23.4 | 23.4 | 23.4 |
| 36 | HW/BA-POOR-TOFDC | 236 | 15.0 | 15.0 | 15.0 | 15.0 |
| 38 | DR-TOFDC | 238 | 20.9 | 20.9 | 20.9 | 20.9 |
| 42 | CW-MED-TOFDC-EBM | 242 | 16.7 | 16.7 | 16.8 | 16.8 |
| 43 | CW-POOR-TOFDC-EBM | 243 | 13.0 | 13.0 | 13.0 | 13.0 |
| 44 | HW/BA-GOOD-TOFDC-EBM | 244 | 28.8 | 28.8 | 28.8 | 28.8 |

[5] Based on recommendations from P.O'Connor , Kruger Forest Products, that site index of cottonwood leading stands almost never drop below 25m site index.

| Current AU | Current AU Description | Future AU | Pre-EBM | | EBM | |
|---|---|---|---|---|---|---|
| | | | Present SI | Future SI | Present SI | Future SI |
| 45 | HW/BA-MED-TOFDC-EBM | 245 | 23.0 | 23.0 | 23.6 | 23.6 |
| 46 | HW/BA-POOR-TOFDC-EBM | 246 | 15.7 | 15.7 | 15.7 | 15.7 |
| 47 | SS-TOFDC-EBM | 247 | 21.9 | 21.9 | 23.0 | 23.0 |
| 48 | DR-TOFDC-EBM | 248 | 24.5 | 24.5 | 24.5 | 24.5 |
| 49 | ACT-TOFDC-EBM | 249 | 29.6 | 29.6 | | |
| 52 | CW-MED-TOFDC-EBM-VQO | 252 | | | 15.4 | 15.4 |
| 53 | CW-POOR-TOFDC-EBM-VQO | 253 | | | 13.0 | 13.0 |
| 55 | HW/BA-MED-TOFDC-EBM-VQO | 255 | | | 21.1 | 21.1 |
| 56 | HW/BA-POOR-TOFDC-EBM-VQO | 256 | | | 15.8 | 15.8 |
| 57 | SS-TOFDC-EBM-VQO | 257 | | | 18.7 | 18.7 |
| 58 | DR-TOFDC-EBM-VQO | 258 | | | 26.5 | 26.5 |
| 61 | CW-MARG | 261 | 10.8 | 20.8 | 10.8 | 20.8 |
| 62 | HW/BA-MARG | 262 | 12.8 | 20.4 | 12.8 | 20.4 |
| 63 | CW-MARG-EBM | 263 | 10.9 | 19.0 | 10.9 | 19.1 |
| 64 | HW/BA-MARG-EBM | 264 | 12.6 | 17.8 | 12.7 | 18.2 |
| 65 | CW-MARG-EBM-VQO | 265 | | | 11.0 | 16.4 |
| 66 | HW/BA-MARG-EBM-VQO | 266 | | | 13.0 | 14.2 |
| 67 | CW-MARG-TOFDC | 267 | 10.9 | 10.9 | 10.9 | 10.9 |
| 68 | HW/BA-MARG-TOFDC | 268 | 12.8 | 12.8 | 12.8 | 12.8 |
| 69 | CW-MARG-TOFDC-EBM | 269 | 10.9 | 10.9 | 10.9 | 10.9 |
| 70 | HW/BA-MARG-TOFDC-EBM | 270 | 12.9 | 12.9 | 12.9 | 12.9 |
| 72 | HW/BA-MARG-TOFDC-EBM-VQO | | | | 12.8 | 12.8 |
| 101 | CW-GOOD | 301 | 19.9 | 19.9 | 19.9 | 19.9 |
| 102 | CW-MED | 302 | 22.6 | 22.6 | 22.6 | 22.6 |
| 103 | CW-POOR | 303 | 13.0 | 13.0 | 13.0 | 13.0 |
| 104 | HW/BA-GOOD | 304 | 25.6 | 25.6 | 25.6 | 25.6 |
| 105 | HW/BA-MED | 305 | 23.0 | 23.0 | 23.0 | 23.0 |
| 106 | HW/BA-POOR | 306 | 21.4 | 21.4 | 21.4 | 21.4 |
| 107 | SS | 307 | 25.4 | 25.4 | 25.4 | 25.4 |
| 108 | DR | 308 | 22.0 | 22.0 | 22.0 | 22.0 |
| 111 | CW-GOOD-EBM | 311 | 18.9 | 18.9 | 18.8 | 18.8 |
| 112 | CW-MED-EBM | 312 | 18.4 | 18.4 | 18.4 | 18.4 |
| 113 | CW-POOR-EBM | 313 | 21.0 | 21.0 | 21.0 | 21.0 |
| 114 | HW/BA-GOOD-EBM | 314 | 25.0 | 25.0 | 25.0 | 25.0 |
| 115 | HW/BA-MED-EBM | 315 | 22.9 | 22.9 | 22.9 | 22.9 |
| 116 | HW/BA-POOR-EBM | 316 | 21.3 | 21.3 | 21.3 | 21.3 |
| 117 | SS-EBM | 317 | 24.3 | 24.3 | 24.4 | 24.4 |
| 118 | DR-EBM | 318 | 22.1 | 22.1 | 22.1 | 22.1 |
| 119 | ACT-EBM | 319 | 26.8 | 26.8 | | |
| 120 | FDC-EBM | 320 | 22.9 | 22.9 | 23.3 | 23.3 |
| 121 | CW-GOOD-EBM-VQO | 321 | | | 16.8 | 16.8 |

| Current AU | Current AU Description | Future AU | Pre-EBM | | EBM | |
|---|---|---|---|---|---|---|
| | | | Present SI | Future SI | Present SI | Future SI |
| 122 | CW-MED-EBM-VQO | 322 | | | 16.6 | 16.6 |
| 124 | HW/BA-GOOD-EBM-VQO | 324 | | | 26.6 | 26.6 |
| 125 | HW/BA-MED-EBM-VQO | 325 | | | 22.1 | 22.1 |
| 128 | DR-EBM-VQO | 328 | | | 21.0 | 21.0 |
| 131 | CW-GOOD-TOFDC | 331 | 27.0 | 27.0 | 27.0 | 27.0 |
| 132 | CW-MED-TOFDC | 332 | 15.0 | 15.0 | 15.0 | 15.0 |
| 135 | HW/BA-MED-TOFDC | 335 | 21.3 | 21.3 | 21.3 | 21.3 |
| 141 | CW-GOOD-TOFDC-EBM | 341 | 19.4 | 23.3 | 19.3 | 23.4 |
| 144 | HW/BA-GOOD-TOFDC-EBM | 344 | 24.9 | 26.2 | 24.7 | 26.2 |
| 145 | HW/BA-MED-TOFDC-EBM | 345 | 22.3 | 23.3 | 22.1 | 23.3 |
| 146 | HW/BA-POOR-TOFDC-EBM | 346 | 24.8 | 15.0 | 24.5 | 15.0 |
| 147 | SS-TOFDC-EBM | 347 | 27.4 | 27.7 | 26.5 | 26.1 |
| 148 | DR-TOFDC-EBM | 348 | 24.3 | 24.2 | 18.7 | 18.3 |
| 151 | CW-GOOD-TOFDC-EBM-VQO | 351 | | | 20.0 | 20.0 |
| 154 | HW/BA-GOOD-TOFDC-EBM-VQO | 354 | | | 26.3 | 25.4 |
| 155 | HW/BA-MED-TOFDC-EBM-VQO | 355 | | | 23.5 | 22.8 |
| 158 | DR-TOFDC-EBM-VQO | 358 | | | 25.5 | 25.5 |
| 162 | HW/BA-MARG | 362 | 19.3 | 19.3 | 19.3 | 19.3 |
| 163 | CW-MARG-EBM | 363 | 16.7 | 16.7 | 16.7 | 16.7 |
| 164 | HW/BA-MARG-EBM | 364 | 18.3 | 18.3 | 19.0 | 19.0 |
| 167 | CW-MARG-TOFDC | 367 | 8.0 | 8.0 | 8.0 | 8.0 |
| 401 | CW-GOOD | 401 | 19.3 | 19.3 | 19.3 | 19.3 |
| 402 | CW-MED | 402 | 21.5 | 21.5 | 21.5 | 21.5 |
| 403 | CW-POOR | 403 | 20.6 | 20.6 | 20.6 | 20.6 |
| 404 | HW/BA-GOOD | 404 | 23.7 | 23.7 | 23.7 | 23.7 |
| 405 | HW/BA-MED | 405 | 23.0 | 23.0 | 23.0 | 23.0 |
| 406 | HW/BA-POOR | 406 | 22.5 | 22.5 | 22.5 | 22.5 |
| 410 | FDC | 410 | 27.8 | 27.8 | 27.8 | 27.8 |
| 411 | CW-GOOD-EBM | 411 | 18.0 | 18.0 | 18.0 | 18.0 |
| 412 | CW-MED-EBM | 412 | 18.4 | 18.4 | 18.4 | 18.4 |
| 413 | CW-POOR-EBM | 413 | 19.3 | 19.3 | 19.5 | 19.5 |
| 414 | HW/BA-GOOD-EBM | 414 | 23.9 | 23.9 | 23.9 | 23.9 |
| 415 | HW/BA-MED-EBM | 415 | 22.3 | 22.3 | 22.2 | 22.2 |
| 416 | HW/BA-POOR-EBM | 416 | 17.7 | 17.7 | 17.7 | 17.7 |
| 419 | ACT-EBM | 419 | 25.0 | 25.0 | | |
| 420 | FDC-EBM | 420 | 21.8 | 21.8 | 21.9 | 21.9 |
| 421 | CW-GOOD-EBM-VQO | 421 | | | 15.3 | 15.3 |
| 422 | CW-MED-EBM-VQO | 422 | | | 17.5 | 17.5 |
| 423 | CW-POOR-EBM-VQO | 423 | | | 18.6 | 18.6 |
| 424 | HW/BA-GOOD-EBM-VQO | 424 | | | 25.5 | 25.5 |
| 461 | CW-MARG | 461 | 13.4 | 13.4 | 13.4 | 13.4 |

| Current AU | Current AU Description | Future AU | Pre-EBM | | EBM | |
|---|---|---|---|---|---|---|
| | | | Present SI | Future SI | Present SI | Future SI |
| 462 | HW/BA-MARG | 462 | 12.8 | 12.8 | 12.8 | 12.8 |
| 463 | CW-MARG-EBM | 463 | 12.0 | 12.0 | 12.3 | 12.3 |
| 464 | HW/BA-MARG-EBM | 464 | 15.9 | 15.9 | 15.4 | 15.4 |
| **Average Existing Natural** | | | **16.0** | **20.1** | **16.0** | **20.1** |
| **Average Existing Managed** | | | **21.8** | **21.9** | **21.8** | **21.9** |
| **Average NSR** | | | **19.7** | **19.7** | **19.9** | **19.9** |
| **Average Total** | | | **17.2** | **20.4** | **17.3** | **20.5** |

## 7.5 Utilization Levels

The utilization level defines the maximum height of stumps that may be left on harvested areas and the minimum top diameter inside bark (DIB) and minimum diameter (DBH) of stems that must be removed from harvested areas. These factors are needed to calculate merchantable stand volume for use in the analysis. The levels used in the analysis reflect the current operational practice (Table 45).

**Table 45 – Utilization levels**

| Era | Utilization | | |
|---|---|---|---|
| | Minimum DBH (cm) | Maximum Stump Height (cm) | Minimum Top DIB (cm) |
| Existing Natural Stands | 17.5 | 30.0 | 15.0 |
| Existing Managed Stands | 12.5 | 30.0 | 10.0 |
| Future Managed Stands | 12.5 | 30.0 | 10.0 |

## 7.6 Decay, Waste and Breakage for Natural Unmanaged Stands

The decay, waste and breakage (DWB) factors are applied to unmanaged stand yield tables to obtain net volume per hectare. These factors are assigned to natural stand volumes automatically in VDYP based on the Public Sustained Yield Unit (PSYU) location (#195 for Kingcome TSA). Licensee experience suggests that red cedar volumes are being underestimated because decay, waste and breakage factors are too high. However, no data is available to support this assumption, so the default PSYU factors will be used in this analysis.

## 7.7 Operational Adjustment Factors

Operational adjustment factors (OAFs) are applied in order to adjust managed stand yields generated by TIPSY to reflect such factors as gaps in stands and decay. The default factors most commonly used are an OAF1 of 15 percent and an OAF2 of 5 percent for a combined reduction of 20% in stand yield, or more at ages greater than 100 years before any other management-level netdowns are applied. OAF1 is a constant percentage reduction to account for unmapped openings in stands, distribution of stems, endemic pests and diseases, and other risks to potential yield. OAF2 is an increasing percentage reduction that can be applied to account for decay, waste

and breakage. The MoFR recommends that the standard OAF1 of 15% and an OAF2 of 5% be used for existing and future managed stands.

Interfor has expressed concern that the 15% OAF1 adjustment overstates the impacts that it is designed to capture. Smaller block sizes characteristic of current operations, and those expected under EBM, reduce the variability of factors associated with the OAF1 allowance as they are more likely to be typed out as non-productive features or incorporated into adjacent unharvested conditions such as wildlife features. On this basis, it has been proposed by Interfor that the OAF1 allowance should be reduced to 8% for existing post-1995 and future regenerating types, to capture the changes in operating practices. While the base case will employ the status quo 15% OAF1, a sensitivity analysis will be conducted to determine the impact of the proposed 8% OAF1.

# 8.0 SILVICULTURE

Silvicultural practices and the conditions of existing regenerating conditions in the TSA need to be considered as a prelude to developing managed yield curves.

## 8.1 Regeneration Delay

Licensees have indicated that regeneration delays range from one to three years, with most cutblocks being replanted within one year of harvest.

## 8.2 Current and Backlog Not Satisfactorily Restocked Areas

NSR areas originally contained operable timber, were harvested and have not yet regenerated to commercial species. For every stand scheduled for harvest there is a target period for regeneration following harvest. Under the Silviculture Regulations land is not allowed to become backlog. It must be planted within the regeneration delay period if it has not regenerated naturally before that. No backlog NSR exists in the Kingcome TSA. Land that has been harvested recently, for which the regeneration delay period has not yet expired, is current NSR. Current NSR is part of the working forest and is expected to be regenerated on schedule. Stands were designated NSR where the current inventory attribute information is missing or unreliable, in one of three ways, resulting in a total NSR area of 12,937 hectares:

1. If previous stand attribute data were available, the previous stand attributes were used to assign analysis units using a combination of leading species, age, height and stocking classes to assign broad good, medium, and poor site classes. This applied to 3,809 hectares.
2. If no previous stand attribute data was available, the dominant analysis unit in a given BGC subzone was used to assign an equivalent analysis unit to each stand occurring in the same BGC subzone. This applied to 8,851 hectares.
3. In some cases, the combination of age, height, and inventory site index from the current VRI was considered questionable (*ie*., height 1.3m, age 250yrs). For these stands, the current inventory attributes were ignored, and the stands were assumed to be NSR. No change was made to the analysis unit assignment. This applied to 277 hectares.

Some of these NSR areas may actually be regenerated, but new forest cover inventory attributes have not yet been assigned to the inventory database.

## 8.3 Genetic Gain

Improvements in growth due to the use of genetically improved seed were modelled during yield table development. Genetic gain is attributed to class ‘A’ seed. Genetic gain estimates are based on Tree Improvement Branch three year average gains between 2005 and 2007. For the Kingcome TSA, genetic gains were assigned only to future managed stands and specifically only for planted regimes of either redcedar or Douglas-fir. One hundred percent of class A seed is used for planted redcedar, and the 3-year average genetic gain is 3%. The genetic gain for Douglas-fir is 6.3%. However, the current operational use of Fdc select seed is 50% Therefore, there is a 3% realized gain for Fdc.

## 8.4 Pre-EBM Silviculture

### *8.4.1 Silviculture Management Regimes*

In the Pre-EBM scenario, clearcutting is the silvicultural system most commonly employed in the Kingcome TSA. Trees are retained when necessary to meet riparian or wildlife habitat objectives.

Reductions to account for wildlife trees will be applied when the forest estate model is run, rather than directly on the yield curves. All yield curves have been generated assuming even-aged management of all stands. Any retention that is left is assumed to be permanently lost to harvesting.

Riparian reserve zones have been spatially netted out of the THLB, and no retention modelling will be required for these areas.

Pre-EBM yield curves are reported in Appendix 1 of this Data Package.

### *8.4.2 Existing Natural Stands – Pre-EBM*

Any stand that is 38 years of age or older in 2007 is deemed to be an existing natural (unmanaged) stand and will have yields predicted using VDYP. This is consistent with the assumption that existing managed stands were established starting in 1970. Table 46 lists the average input parameters used for NSYTs.

**Table 46 – Input attributes for existing natural stands**

| Current Analysis Unit | Analysis Unit Description | Species 1 | Species 2 | Species 3 | Species Percent 1 | Species Percent 2 | Species Percent 3 | Other Species Percent | Crown Closure (%) | Inventory Site Index (m) | Height (m) | Total Age (yrs) | Conifer Proportion (%) | Volume Adjustment Factor | Utilization Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CW-GOOD | CW | HW | FDC | 70 | 19 | 8 | 3 | 54 | 24 | 23 | 57 | 99% | 1.19 | 17.5 |
| 2 | CW-MED | CW | HW | BA | 61 | 30 | 4 | 5 | 64 | 17 | 36 | 279 | 100% | 1.19 | 17.5 |
| 3 | CW-POOR | CW | HW | YC | 58 | 28 | 10 | 4 | 63 | 13 | 28 | 297 | 100% | 1.23 | 17.5 |
| 4 | HW/BA-GOOD | HW | SS | BA | 77 | 7 | 7 | 9 | 73 | 27 | 30 | 67 | 98% | 1.18 | 17.5 |
| 5 | HW/BA-MED | HW | CW | BA | 73 | 11 | 9 | 7 | 70 | 22 | 29 | 91 | 98% | 1.20 | 17.5 |
| 6 | HW/BA-POOR | HW | CW | BA | 64 | 15 | 14 | 7 | 65 | 16 | 33 | 205 | 100% | 1.23 | 17.5 |
| 7 | SS | SS | HW | CW | 64 | 25 | 7 | 4 | 60 | 19 | 38 | 199 | 98% | 1.17 | 17.5 |
| 8 | DR | DR | HW | SS | 71 | 18 | 6 | 5 | 69 | 23 | 24 | 62 | 100% | 1.15 | 17.5 |
| 10 | FDC | FDC | HW | CW | 66 | 23 | 11 | 0 | 54 | 31 | 29 | 52 | 100% | 1.19 | 17.5 |
| 11 | CW-GOOD-EBM | CW | HW | DR | 61 | 31 | 4 | 4 | 70 | 23 | 25 | 82 | 96% | 1.16 | 17.5 |
| 12 | CW-MED-EBM | CW | HW | YC | 60 | 26 | 8 | 6 | 65 | 16 | 33 | 251 | 98% | 1.18 | 17.5 |
| 13 | CW-POOR-EBM | CW | HW | YC | 59 | 20 | 18 | 3 | 62 | 13 | 29 | 306 | 100% | 1.21 | 17.5 |
| 14 | HW/BA-GOOD-EBM | HW | CW | BA | 79 | 9 | 6 | 6 | 76 | 28 | 34 | 75 | 96% | 1.17 | 17.5 |
| 15 | HW/BA-MED-EBM | HW | CW | BA | 72 | 14 | 6 | 8 | 74 | 23 | 29 | 86 | 96% | 1.18 | 17.5 |
| 16 | HW/BA-POOR-EBM | HW | CW | BA | 61 | 19 | 12 | 8 | 63 | 16 | 32 | 201 | 98% | 1.19 | 17.5 |

| Current Analysis Unit | Analysis Unit Description | Species 1 | Species 2 | Species 3 | Species Percent 1 | Species Percent 2 | Species Percent 3 | Other Species Percent | Crown Closure (%) | Inventory Site Index (m) | Height (m) | Total Age (yrs) | Conifer Proportion (%) | Volume Adjustment Factor | Utilization Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17 | SS-EBM | SS | HW | CW | 68 | 18 | 6 | 8 | 46 | 20 | 44 | 231 | 97% | 1.20 | 17.5 |
| 18 | DR-EBM | DR | HW | CW | 74 | 14 | 7 | 5 | 73 | 25 | 26 | 72 | 100% | 1.18 | 17.5 |
| 19 | ACT-EBM | ACT | DR | SS | 72 | 15 | 7 | 6 | 66 | 29 | 37 | 105 | 85% | 1.17 | 17.5 |
| 20 | FDC-EBM | FDC | HW | CW | 55 | 32 | 10 | 3 | 67 | 25 | 34 | 125 | 98% | 1.15 | 17.5 |
| 32 | CW-MED-TOFDC | CW | HW | YC | 44 | 39 | 10 | 7 | 70 | 16 | 35 | 284 | 100% | 1.26 | 17.5 |
| 33 | CW-POOR-TOFDC | YC | HW | CW | 40 | 37 | 17 | 6 | 46 | 12 | 26 | 282 | 100% | 1.20 | 17.5 |
| 34 | HW/BA-GOOD-TOFDC | HW | CW | SS | 94 | 2 | 2 | 2 | 75 | 27 | 35 | 93 | 98% | 1.19 | 17.5 |
| 35 | HW/BA-MED-TOFDC | HW | CW | BA | 74 | 13 | 9 | 4 | 69 | 23 | 25 | 64 | 99% | 1.19 | 17.5 |
| 36 | HW/BA-POOR-TOFDC | HW | CW | YC | 57 | 20 | 12 | 11 | 69 | 15 | 34 | 240 | 100% | 1.25 | 17.5 |
| 38 | DR-TOFDC | DR | HW | SS | 66 | 20 | 10 | 4 | 77 | 21 | 21 | 53 | 100% | 1.19 | 17.5 |
| 42 | CW-MED-TOFDC-EBM | CW | HW | YC | 53 | 32 | 7 | 8 | 57 | 17 | 36 | 283 | 100% | 1.22 | 17.5 |
| 43 | CW-POOR-TOFDC-EBM | CW | HW | YC | 49 | 24 | 21 | 6 | 54 | 13 | 29 | 343 | 100% | 1.21 | 17.5 |
| 44 | HW/BA-GOOD-TOFDC-EBM | HW | CW | DR | 74 | 12 | 7 | 7 | 66 | 29 | 33 | 71 | 93% | 1.19 | 17.5 |
| 45 | HW/BA-MED-TOFDC-EBM | HW | FDC | CW | 67 | 10 | 10 | 13 | 69 | 23 | 33 | 106 | 96% | 1.20 | 17.5 |
| 46 | HW/BA-POOR-TOFDC-EBM | HW | CW | BA | 62 | 16 | 11 | 11 | 64 | 16 | 32 | 186 | 100% | 1.21 | 17.5 |
| 47 | SS-TOFDC-EBM | SS | HW | ACT | 60 | 22 | 7 | 11 | 48 | 22 | 44 | 205 | 99% | 1.23 | 17.5 |
| 48 | DR-TOFDC-EBM | DR | HW | CW | 68 | 20 | 5 | 7 | 71 | 24 | 26 | 68 | 100% | 1.14 | 17.5 |
| 49 | ACT-TOFDC-EBM | ACT | DR | SS | 76 | 12 | 12 | 0 | 45 | 30 | 40 | 113 | 88% | 1.23 | 17.5 |
| 61 | CW-MARG | CW | HW | YC | 57 | 26 | 14 | 3 | 64 | 11 | 24 | 288 | 100% | 1.23 | 17.5 |
| 62 | HW/BA-MARG | HW | CW | BA | 62 | 18 | 11 | 9 | 64 | 13 | 30 | 231 | 100% | 1.24 | 17.5 |
| 63 | CW-MARG-EBM | CW | YC | HW | 55 | 26 | 15 | 4 | 61 | 11 | 24 | 311 | 100% | 1.20 | 17.5 |
| 64 | HW/BA-MARG-EBM | HW | CW | BA | 50 | 20 | 16 | 14 | 60 | 13 | 30 | 257 | 100% | 1.17 | 17.5 |
| 67 | CW-MARG-TOFDC | YC | HW | CW | 50 | 30 | 18 | 2 | 57 | 11 | 24 | 286 | 100% | 1.26 | 17.5 |
| 68 | HW/BA-MARG-TOFDC | HW | YC | CW | 62 | 14 | 14 | 10 | 69 | 13 | 31 | 243 | 100% | 1.26 | 17.5 |
| 69 | CW-MARG-TOFDC-EBM | YC | CW | HW | 42 | 31 | 20 | 7 | 54 | 11 | 24 | 304 | 100% | 1.18 | 17.5 |
| 70 | HW/BA-MARG-TOFDC-EBM | HW | CW | BA | 58 | 22 | 12 | 8 | 59 | 13 | 30 | 229 | 100% | 1.24 | 17.5 |

### *8.4.3 Existing Managed Stands – Pre-EBM*

Any stand that is 37 years of age or younger in 2007 is deemed to be an existing managed stand and will have yields predicted using TIPSY. This is consistent with the assumption that existing managed stands were established starting in 1970. Table 47 lists the average input parameters used for existing MSYTs.

**Table 47 – Silviculture regimes for existing managed stands**

| Current AU | Regime # | Analysis Unit Description | Planted / Natural | Regen Delay (yrs) | Regime Percent | Species 1 | Species 1 Percent | Species 2 | Species 2 Percent | Species 3 | Species 3 Percent | Establishment Density (stems/ha) | OAF1 (%) | OAF2 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 101 | 1 | CW/CY-GOOD | P | 1 | 95% | CW | 80% | HW | 20% | | | 1000 | 15% | 5% |
| 101 | 2 | CW/CY-GOOD | N | 3 | 5% | HW | 60% | CW | 40% | | | 4000 | 15% | 5% |
| 102 | 1 | CW/CY-MED | P | 1 | 85% | CW | 80% | HW | 20% | | | 1000 | 15% | 5% |
| 102 | 2 | CW/CY-MED | N | 3 | 15% | HW | 60% | CW | 40% | | | 4000 | 15% | 5% |
| 103 | 1 | CW/CY-POOR | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 15% | 5% |
| 103 | 2 | CW/CY-POOR | N | 3 | 35% | HW | 60% | CW | 40% | | | 4000 | 15% | 5% |
| 104 | 1 | HWC/BA-GOOD | P | 1 | 5% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15% | 5% |
| 104 | 2 | HWC/BA-GOOD | N | 3 | 95% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15% | 5% |
| 105 | 1 | HWC/BA-MED | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15% | 5% |
| 105 | 2 | HWC/BA-MED | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15% | 5% |
| 106 | 1 | HWC/BA-POOR | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15% | 5% |
| 106 | 2 | HWC/BA-POOR | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15% | 5% |
| 107 | 1 | SS | P | 2 | 70% | SS | 40% | BA | 40% | HW | 20% | 1000 | 15% | 5% |
| 107 | 2 | SS | N | 3 | 30% | HW | 40% | SS | 30% | BA | 30% | 5000 | 15% | 5% |
| 108 | 1 | DR | P | 2 | 75% | DR | 100% | | | | | 1000 | 15% | 5% |
| 108 | 2 | DR | P | 2 | 25% | CW | 100% | | | | | 1000 | 15% | 5% |
| 111 | 1 | CW/CY-GOOD-EBM | P | 1 | 95% | CW | 80% | HW | 20% | | | 1000 | 15% | 5% |
| 111 | 2 | CW/CY-GOOD-EBM | N | 3 | 5% | HW | 60% | CW | 40% | | | 4000 | 15% | 5% |
| 112 | 1 | CW/CY-MED-EBM | P | 1 | 85% | CW | 80% | HW | 20% | | | 1000 | 15% | 5% |
| 112 | 2 | CW/CY-MED-EBM | N | 3 | 15% | HW | 60% | CW | 40% | | | 4000 | 15% | 5% |
| 113 | 1 | CW/CY-POOR-EBM | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 15% | 5% |
| 113 | 2 | CW/CY-POOR-EBM | N | 3 | 35% | HW | 60% | CW | 40% | | | 4000 | 15% | 5% |
| 114 | 1 | HWC/BA-GOOD-EBM | P | 1 | 5% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15% | 5% |
| 114 | 2 | HWC/BA-GOOD-EBM | N | 3 | 95% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15% | 5% |
| 115 | 1 | HWC/BA-MED-EBM | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15% | 5% |
| 115 | 2 | HWC/BA-MED-EBM | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15% | 5% |
| 116 | 1 | HWC/BA-POOR-EBM | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15% | 5% |
| 116 | 2 | HWC/BA-POOR-EBM | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15% | 5% |
| 117 | 1 | SS-EBM | P | 2 | 70% | SS | 40% | BA | 40% | HW | 20% | 1000 | 15% | 5% |
| 117 | 2 | SS-EBM | N | 3 | 30% | HW | 40% | SS | 30% | BA | 30% | 5000 | 15% | 5% |
| 118 | 1 | DR-EBM | P | 2 | 75% | DR | 100% | | | | | 1000 | 15% | 5% |
| 118 | 2 | DR-EBM | P | 2 | 25% | CW | 100% | | | | | 1000 | 15% | 5% |
| 119 | 1 | ACT-EBM | P | 2 | 100% | ACT | 100% | | | | | 1000 | 15% | 5% |
| 120 | 1 | FDC-EBM | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 15% | 5% |
| 131 | 1 | CW/CY-TOFDC-GOOD | P | 1 | 95% | CW | 80% | HW | 20% | | | 1000 | 15% | 5% |
| 131 | 2 | CW/CY-TOFDC-GOOD | N | 3 | 5% | HW | 60% | CW | 40% | | | 4000 | 15% | 5% |
| 132 | 1 | CW/CY-TOFDC-MED | P | 1 | 85% | CW | 80% | HW | 20% | | | 1000 | 15% | 5% |

| Current AU | Regime # | Analysis Unit Description | Planted / Natural | Regen Delay (yrs) | Regime Percent | Species 1 | Species 1 Percent | Species 2 | Species 2 Percent | Species 3 | Species 3 Percent | Establishment Density (stems/ha) | OAF1 (%) | OAF2 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 132 | 2 | CW/CY-TOFDC-MED | N | 3 | 15% | HW | 60% | CW | 40% | | | 4000 | 15% | 5% |
| 135 | 1 | HWC/BA-TOFDC-MED | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15% | 5% |
| 135 | 2 | HWC/BA-TOFDC-MED | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15% | 5% |
| 141 | 1 | CW/CY-GOOD-TOFDC-EBM | P | 1 | 95% | CW | 80% | HW | 20% | | | 1000 | 15% | 5% |
| 141 | 2 | CW/CY-GOOD-TOFDC-EBM | N | 3 | 5% | HW | 60% | CW | 40% | | | 4000 | 15% | 5% |
| 144 | 1 | HWC/BA-GOOD-TOFDC-EBM | P | 1 | 5% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15% | 5% |
| 144 | 2 | HWC/BA-GOOD-TOFDC-EBM | N | 3 | 95% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15% | 5% |
| 145 | 1 | HWC/BA-MED-TOFDC-EBM | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15% | 5% |
| 145 | 2 | HWC/BA-MED-TOFDC-EBM | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15% | 5% |
| 146 | 1 | HWC/BA-POOR-TOFDC-EBM | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15% | 5% |
| 146 | 2 | HWC/BA-POOR-TOFDC-EBM | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15% | 5% |
| 147 | 1 | SS-TOFDC-EBM | P | 2 | 70% | SS | 40% | BA | 40% | HW | 20% | 1000 | 15% | 5% |
| 147 | 2 | SS-TOFDC-EBM | N | 3 | 30% | HW | 40% | SS | 30% | BA | 30% | 5000 | 15% | 5% |
| 148 | 1 | DR-TOFDC-EBM | P | 2 | 75% | DR | 100% | | | | | 1000 | 15% | 5% |
| 148 | 2 | DR-TOFDC-EBM | P | 2 | 25% | CW | 100% | | | | | 1000 | 15% | 5% |
| 162 | 1 | HWC/BA-MARG | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15% | 5% |
| 162 | 2 | HWC/BA-MARG | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15% | 5% |
| 163 | 1 | CW/CY-MARG-EBM | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 15% | 5% |
| 163 | 2 | CW/CY-MARG-EBM | N | 3 | 35% | HW | 60% | CW | 40% | | | 4000 | 15% | 5% |
| 164 | 1 | HWC/BA-MARG-EBM | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15% | 5% |
| 164 | 2 | HWC/BA-MARG-EBM | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15% | 5% |
| 167 | 1 | CW/CY-TOFDC-MARG | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 15% | 5% |
| 167 | 2 | CW/CY-TOFDC-MARG | N | 3 | 35% | HW | 60% | CW | 40% | | | 4000 | 15% | 5% |

### *8.4.4 Future Managed Stands – Pre-EBM*

Once a stand is harvested, it is assigned a future managed stand yield curve that reflects current silviculture practices. Table 48 lists the average input parameters used for future MSYTs.

**Table 48 – Silviculture regimes for future managed stands**

| Future Analysis Unit | Regime # | Analysis Unit Description | Planted / Natura | Regeneratin Delay (yrs) | Regime Percent | Species 1 | Species 1 Percent | Species 2 | Species 2 Percent | Species 3 | Species 3 Percent | Establishment Density (stems/ha) | Genetic Gain Species 1 | Genetic Gain Species 2 | Genetic Gain Species 3 | OAF1 (%) | OAF2 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 201 | 1 | CW/CY-GOOD | P | 1 | 95% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 201 | 2 | CW/CY-GOOD | N | 3 | 5% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 202 | 1 | CW/CY-MED | P | 1 | 85% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 202 | 2 | CW/CY-MED | N | 3 | 15% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 203 | 1 | CW/CY-POOR | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 203 | 2 | CW/CY-POOR | N | 3 | 35% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 204 | 1 | HWC/BA-GOOD | P | 1 | 5% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 204 | 2 | HWC/BA-GOOD | N | 3 | 95% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 205 | 1 | HWC/BA-MED | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 205 | 2 | HWC/BA-MED | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 206 | 1 | HWC/BA-POOR | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 206 | 2 | HWC/BA-POOR | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 207 | 1 | SS | P | 2 | 70% | SS | 40% | BA | 40% | HW | 20% | 1000 | 0% | 0 | 0% | 15% | 5% |
| 207 | 2 | SS | N | 3 | 30% | HW | 40% | SS | 30% | BA | 30% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 208 | 1 | DR | P | 2 | 75% | DR | 100% | | | | | 1000 | 0% | 0 | 0% | 15% | 5% |
| 208 | 2 | DR | P | 2 | 25% | CW | 100% | | | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 210 | 1 | FDC | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 211 | 1 | CW/CY-GOOD-EBM | P | 1 | 95% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 211 | 2 | CW/CY-GOOD-EBM | N | 3 | 5% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 212 | 1 | CW/CY-MED-EBM | P | 1 | 85% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 212 | 2 | CW/CY-MED-EBM | N | 3 | 15% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 213 | 1 | CW/CY-POOR-EBM | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 213 | 2 | CW/CY-POOR-EBM | N | 3 | 35% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 214 | 1 | HWC/BA-GOOD-EBM | P | 1 | 5% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 214 | 2 | HWC/BA-GOOD-EBM | N | 3 | 95% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 215 | 1 | HWC/BA-MED-EBM | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 215 | 2 | HWC/BA-MED-EBM | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 216 | 1 | HWC/BA-POOR-EBM | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 216 | 2 | HWC/BA-POOR-EBM | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 217 | 1 | SS-EBM | P | 2 | 70% | SS | 40% | BA | 40% | HW | 20% | 1000 | 0% | 0 | 0% | 15% | 5% |
| 217 | 2 | SS-EBM | N | 3 | 30% | HW | 40% | SS | 30% | BA | 30% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 218 | 1 | DR-EBM | P | 2 | 75% | DR | 100% | | | | | 1000 | 0% | 0 | 0% | 15% | 5% |
| 218 | 2 | DR-EBM | P | 2 | 25% | CW | 100% | | | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 219 | 1 | ACT-EBM | P | 2 | 100% | ACT | 100% | | | | | 1000 | 0% | 0 | 0% | 15% | 5% |
| 220 | 1 | FDC-EBM | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 232 | 1 | CW/CY-TOFDC-MED | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |

| Future Analysis Unit | Regime # | Analysis Unit Description | Planted / Natura | Regeneratin Delay (yrs) | Regime Percent | Species 1 | Species 1 Percent | Species 2 | Species 2 Percent | Species 3 | Species 3 Percent | Establishment Density (stems/ha) | Genetic Gain Species 1 | Genetic Gain Species 2 | Genetic Gain Species 3 | OAF1 (%) | OAF2 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 233 | 1 | CW/CY-TOFDC-POOR | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 234 | 1 | HWC/BA-TOFDC-GOOD | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 235 | 1 | HWC/BA-TOFDC-MED | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 236 | 1 | HWC/BA-TOFDC-POOR | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 238 | 1 | DR-TOFDC | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 242 | 1 | CW/CY-MED-TOFDC-EBM | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 243 | 1 | CW/CY-POOR-TOFDC-EBM | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 244 | 1 | HWC/BA-GOOD-TOFDC-EBM | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 245 | 1 | HWC/BA-MED-TOFDC-EBM | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 246 | 1 | HWC/BA-POOR-TOFDC-EBM | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 247 | 1 | SS-TOFDC-EBM | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 248 | 1 | DR-TOFDC-EBM | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 249 | 1 | ACT-TOFDC-EBM | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 261 | 1 | CW/CY-MARG | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 261 | 2 | CW/CY-MARG | N | 3 | 35% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 262 | 1 | HWC/BA-MARG | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 262 | 2 | HWC/BA-MARG | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 263 | 1 | CW/CY-MARG-EBM | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 263 | 2 | CW/CY-MARG-EBM | N | 3 | 35% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 264 | 1 | HWC/BA-MARG-EBM | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 264 | 2 | HWC/BA-MARG-EBM | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 267 | 1 | CW/CY-TOFDC-MARG | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 268 | 1 | HWC/BA-TOFDC-MARG | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 269 | 1 | CW/CY-MARG-TOFDC-EBM | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 270 | 1 | HWC/BA-MARG-TOFDC-EBM | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 301 | 1 | CW/CY-GOOD | P | 1 | 95% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 301 | 2 | CW/CY-GOOD | N | 3 | 5% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 302 | 1 | CW/CY-MED | P | 1 | 85% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 302 | 2 | CW/CY-MED | N | 3 | 15% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 303 | 1 | CW/CY-POOR | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 303 | 2 | CW/CY-POOR | N | 4 | 35% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 304 | 1 | HWC/BA-GOOD | P | 1 | 5% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 304 | 2 | HWC/BA-GOOD | N | 3 | 95% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 305 | 1 | HWC/BA-MED | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 305 | 2 | HWC/BA-MED | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 306 | 1 | HWC/BA-POOR | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 306 | 2 | HWC/BA-POOR | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 307 | 1 | SS | P | 2 | 70% | SS | 40% | BA | 40% | HW | 20% | 1000 | 0% | 0 | 0% | 15% | 5% |

| Future Analysis Unit | Regime # | Analysis Unit Description | Planted / Natura | Regeneratin Delay (yrs) | Regime Percent | Species 1 | Species 1 Percent | Species 2 | Species 2 Percent | Species 3 | Species 3 Percent | Establishment Density (stems/ha) | Genetic Gain Species 1 | Genetic Gain Species 2 | Genetic Gain Species 3 | OAF1 (%) | OAF2 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 307 | 2 | SS | N | 4 | 30% | HW | 40% | SS | 30% | BA | 30% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 308 | 1 | DR | P | 2 | 75% | DR | 100% | | | | | 1000 | 0% | 0 | 0% | 15% | 5% |
| 308 | 2 | DR | P | 2 | 25% | CW | 100% | | | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 311 | 1 | CW/CY-GOOD-EBM | P | 1 | 95% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 311 | 2 | CW/CY-GOOD-EBM | N | 3 | 5% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 312 | 1 | CW/CY-MED-EBM | P | 1 | 85% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 312 | 2 | CW/CY-MED-EBM | N | 3 | 15% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 313 | 1 | CW/CY-POOR-EBM | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 313 | 2 | CW/CY-POOR-EBM | N | 4 | 35% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 314 | 1 | HWC/BA-GOOD-EBM | P | 1 | 5% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 314 | 2 | HWC/BA-GOOD-EBM | N | 3 | 95% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 315 | 1 | HWC/BA-MED-EBM | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 315 | 2 | HWC/BA-MED-EBM | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 316 | 1 | HWC/BA-POOR-EBM | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 316 | 2 | HWC/BA-POOR-EBM | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 317 | 1 | SS-EBM | P | 2 | 70% | SS | 40% | BA | 40% | HW | 20% | 1000 | 0% | 0 | 0% | 15% | 5% |
| 317 | 2 | SS-EBM | N | 4 | 30% | HW | 40% | SS | 30% | BA | 30% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 318 | 1 | DR-EBM | P | 2 | 75% | DR | 100% | | | | | 1000 | 0% | 0 | 0% | 15% | 5% |
| 318 | 2 | DR-EBM | P | 2 | 25% | CW | 100% | | | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 319 | 1 | ACT-EBM | P | 2 | 100% | ACT | 100% | | | | | 1000 | 0% | 0 | 0% | 15% | 5% |
| 320 | 1 | FDC-EBM | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 331 | 1 | CW/CY-TOFDC-GOOD | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 332 | 1 | CW/CY-TOFDC-MED | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 335 | 1 | HWC/BA-TOFDC-MED | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 341 | 1 | CW/CY-GOOD-TOFDC-EBM | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 344 | 1 | HWC/BA-GOOD-TOFDC-EBM | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 345 | 1 | HWC/BA-MED-TOFDC-EBM | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 346 | 1 | HWC/BA-POOR-TOFDC-EBM | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 347 | 1 | SS-TOFDC-EBM | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 348 | 1 | DR-TOFDC-EBM | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 362 | 1 | HWC/BA-MARG | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 362 | 2 | HWC/BA-MARG | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 363 | 1 | CW/CY-MARG-EBM | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 363 | 2 | CW/CY-MARG-EBM | N | 4 | 35% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 364 | 1 | HWC/BA-MARG-EBM | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 364 | 2 | HWC/BA-MARG-EBM | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 367 | 1 | CW/CY-TOFDC-MARG | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 601 | 1 | CW/CY-GOOD | P | 1 | 95% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |

| Future Analysis Unit | Regime # | Analysis Unit Description | Planted / Natura | Regeneratin Delay (yrs) | Regime Percent | Species 1 | Species 1 Percent | Species 2 | Species 2 Percent | Species 3 | Species 3 Percent | Establishment Density (stems/ha) | Genetic Gain Species 1 | Genetic Gain Species 2 | Genetic Gain Species 3 | OAF1 (%) | OAF2 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 601 | 2 | CW/CY-GOOD | N | 3 | 5% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 602 | 1 | CW/CY-MED | P | 1 | 85% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 602 | 2 | CW/CY-MED | N | 3 | 15% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 603 | 1 | CW/CY-POOR | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 603 | 2 | CW/CY-POOR | N | 4 | 35% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 604 | 1 | HWC/BA-GOOD | P | 1 | 5% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 604 | 2 | HWC/BA-GOOD | N | 3 | 95% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 605 | 1 | HWC/BA-MED | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 605 | 2 | HWC/BA-MED | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 606 | 1 | HWC/BA-POOR | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 606 | 2 | HWC/BA-POOR | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 610 | 1 | FDC | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 611 | 1 | CW/CY-GOOD-EBM | P | 1 | 95% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 611 | 2 | CW/CY-GOOD-EBM | N | 3 | 5% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 612 | 1 | CW/CY-MED-EBM | P | 1 | 85% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 612 | 2 | CW/CY-MED-EBM | N | 3 | 15% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 613 | 1 | CW/CY-POOR-EBM | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 613 | 2 | CW/CY-POOR-EBM | N | 4 | 35% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 614 | 1 | HWC/BA-GOOD-EBM | P | 1 | 5% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 614 | 2 | HWC/BA-GOOD-EBM | N | 3 | 95% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 615 | 1 | HWC/BA-MED-EBM | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 615 | 2 | HWC/BA-MED-EBM | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 616 | 1 | HWC/BA-POOR-EBM | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 616 | 2 | HWC/BA-POOR-EBM | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 619 | 1 | ACT-EBM | P | 2 | 100% | ACT | 100% | | | | | 1000 | 0% | 0 | 0% | 15% | 5% |
| 620 | 1 | FDC-EBM | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0 | 3% | 15% | 5% |
| 661 | 1 | CW/CY-MARG | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 661 | 2 | CW/CY-MARG | N | 4 | 35% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 662 | 1 | HWC/BA-MARG | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 662 | 2 | HWC/BA-MARG | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |
| 663 | 1 | CW/CY-MARG-EBM | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 3% | 0 | 0% | 15% | 5% |
| 663 | 2 | CW/CY-MARG-EBM | N | 4 | 35% | HW | 60% | CW | 40% | | | 4000 | 0% | 0 | 0% | 15% | 5% |
| 664 | 1 | HWC/BA-MARG-EBM | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0 | 0% | 15% | 5% |
| 664 | 2 | HWC/BA-MARG-EBM | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0 | 0% | 15% | 5% |

## 8.5 EBM Silviculture

### *8.5.1 EBM Silviculture Regimes*

In the EBM scenario, harvesting and silviculture regimes are established to meet the EBM stand-level retention Objective 16.

1. *"Maintain forest structure and diversity at the stand level:*

a) *In cutblocks where a clearcut harvest system is used, by establishing stand retention equal to or greater than 15% of the cutblock; and*

b) *"In cutblocks 15 hectares or greater in size where a clearcut system is used, by distributing 50% of stand retention within the cutblock, except in second growth stands where a wind throw hazard assessment indicates a high biophysical hazard for wind throw.*

2. *To the extent practicable, include the following within stand retention:*
   a) *Habitat elements important for species at risk, ungulate winter range, and regionally important wildlife;*
   b) *Representation of ecosystems and plant communities that are red-listed or blue-listed in the watershed and landscape;*
   c) *Functional riparian forest adjacent to active fluvial units, forested swamps, fen and marsh wetlands and upland streams with unique climate and other characteristics;*
   d) *Western red cedar and Yellow cedar in a range of diameters and species representative of the preharvest stand; and*
   e) *Wildlife trees and coarse woody debris.*

In the Pre-EBM scenario no specific stand-level retention requirements are modelled beyond the general wildlife tree patch (WTP) requirement documented in 5.1.18. In the EBM scenario, these requirements will be maintained in the non-EBM zone (Vancouver Island). In the EBM zone, specific stand-level retention objectives have been established (Table 49). These requirements are deemed to capture the Pre-EBM WTP requirements as well. The stand-level impacts are incorporated into the existing yield curves using an appropriate operational adjustment factor (OAF) to reduce the harvested volume. The impacts on existing regeneration and future yield are captured in future managed curves using the volume retention adjustment factor (VRAF) in TIPSY. TIPSY's variable retention model quantifies the regenerated stand's growth and yield impacts due to overstory shading from the retained stand.

TIPSY applies a VRAF that reduces future yields of the regenerated stand. VRAFs have been developed for two coastal species only (Hw and Fdc). Assumptions used in applying VRAFS include:

- The crown shadow area of the retained trees is completely removed from timber production;
- Approximately 50% of the regenerated trees growing into the shaded area die, while the remaining 50% grow at some reduced rate;
- TIPSY Version 4.1 is used;
- Apply only in the EBM management zone;
- Apply only to future managed yield tables; and
- Apply only to the Hw/Ba and Fdc AU's.

VRAFs are not applied to Cw AU's, as confirmed and agreed to by Mario Di Lucca (MoFR Research Branch). The reason is that TIPSY uses HW as a substitute species for CW stands, and these VRAFs will not represent the cedar old-growth conditions being modelled.

The parameters required by TIPSY to compute a VRAF are:

- the percentage crown cover of the original stand that is retained;
- the top height at the time of the VR harvest;
- the proportional allocation of aggregate (*i.e.*, groups) vs. dispersed (*i.e.*, single tree) retention; and
- the total amount of affected edge, estimated by the average size of aggregate groups (10,000 $m^2$ in this case), and the average crown width of dispersed trees.

Based on discussions with licensees and MoFR, agreement was reached on modelling the EBM retention yield tables as follows:

- The % VRAF retention in the EBM general zone will be reduced from 15% to 10%, to recognize retention from other modelling constraints (riparian, esa, etc);
- The aggregate / dispersed proportion to be 95% aggregate / 5% dispersed, based on Interfor's internal block review;
- Blocks less than 15ha in size will not have a VRAF applied in the EBM zone (consistent with the current Ministerial Order). Interfor estimates that 40% of its cutblocks (area based) are less than 15 hectares in size. This will not be addressed by splitting AUs, but rather by applying a weighted average to the AU (this area cannot be identified spatially, so it is treated as an aspatial weight);
- The high retention EBM zone is defined using VQO preservation and retention designations; and
- Two potential sensitivity analyses were identified (high and low).

**Table 49 – EBM stand-level retention requirements**

| Scenario | EBM Zone | VQO | Total Retention Amount (%) | Portion that is Aggregated | Portion that is Dispersed ($m^2$/ha) | WTP Allowance | OAF1 | OAF2 | VRAF Applied |
|---|---|---|---|---|---|---|---|---|---|
| **Base Line** | Non-EBM | Current VQO | N/A | N/A | N/A | 6% | 15% | 5% | No |
| | General | | 10% | 95% | 5% | - | 15% | 5% | 40% No<br>60% Yes |
| | High retention | P & R | 40% | 80% | 20% | - | 15% | 5% | Yes |
| **High Sensitivity** | Non-EBM | Current VQO | N/A | N/A | N/A | 6% | 15% | 5% | No |
| | General | | 15% | 80% | 20% | - | 15% | 5% | Yes |
| | High retention | Expand to include wildzones and/or special viewscapes | 50% | 20% | 80% | - | 15% | 5% | Yes |
| **Low Sensitivity** | Non-EBM | Current VQO | N/A | N/A | N/A | 6% | 15% | 5% | No |
| | General | | 5% | 95% | 5% | - | 15% | 5% | 40% No<br>60% Yes |
| | High retention | P & R | 30% | 60% | 40% | - | 15% | 5% | Yes |

The EBM-high retention zone has two different area configurations depending on the scenario. The 'Base EBM' and 'Low sensitivity scenarios' include all the preservation and retention VQOs as defined in the Kingcome Visual Landscape Inventory. The 'High sensitivity' scenario area includes all these VQOs and adds the Wild Zone and Special Zone from the CCLRMP Visual Management Zone map provided by the MoFR.

In the Base EBM scenario and Low Sensitivity scenarios, the EBM-general percent retention numbers reflect the fact that a considerable amount of land base is reserved for other non-timber values such as riparian, terrain, cultural and wildlife. At the cutblock level these areas are included as non-harvest areas within or adjacent to the block and are often the basis for retention. The combination of these non-timber values along with a suggested total retention amount of 10% and 5% respectively will fulfill the requirements of the stand level retention objective.

Yield curves are reported in Appendix 2 of this Data Package. As the Pre-EBM scenario yield curves for stands in the non-EBM zone (Vancouver Island) are unchanged in the EBM scenario, they are not presented.

### *8.5.2 Existing Natural Stands - EBM*

Table 50 lists the average input parameters used for existing NSYTs.

**Table 50 – Input attributes for existing natural stands - EBM**

| Current Analysis Unit | Analysis Unit Description | Species 1 | Species 2 | Species 3 | Species 1 Percent | Species 2 Percent | Species 3 Percent | Other Species Percent | Crown Closure (%) | Inventory Site Index (m) | Height (m) | Total Age (yrs) | Conifer Proportion (%) | Volume Adjustment Factor | Utilization Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | CW-GOOD-EBM | CW | HW | DR | 61 | 31 | 4 | 4 | 23 | 25 | 23 | 81 | 96% | 1.16 | 17.5 |
| 12 | CW-MED-EBM | CW | HW | YC | 61 | 26 | 8 | 5 | 17 | 32 | 36 | 242 | 98% | 1.18 | 17.5 |
| 13 | CW-POOR-EBM | CW | HW | YC | 59 | 20 | 18 | 3 | 13 | 29 | 28 | 306 | 100% | 1.21 | 17.5 |
| 14 | HW/BA-GOOD-EBM | HW | CW | BA | 79 | 9 | 6 | 6 | 28 | 33 | 30 | 74 | 96% | 1.17 | 17.5 |
| 15 | HW/BA-MED-EBM | HW | CW | BA | 73 | 14 | 6 | 7 | 23 | 29 | 29 | 84 | 96% | 1.18 | 17.5 |
| 16 | HW/BA-POOR-EBM | HW | CW | BA | 60 | 20 | 12 | 8 | 16 | 32 | 33 | 195 | 98% | 1.19 | 17.5 |
| 17 | SS-EBM | SS | HW | CW | 57 | 27 | 8 | 8 | 18 | 37 | 38 | 196 | 98% | 1.14 | 17.5 |
| 18 | DR-EBM | DR | HW | CW | 75 | 15 | 8 | 2 | 24 | 25 | 24 | 68 | 100% | 1.18 | 17.5 |
| 19 | ACT-EBM | ACT | CW | DR | 67 | 14 | 10 | 9 | 24 | 29 | 29 | 78 | 90% | 1.13 | 17.5 |
| 20 | FDC-EBM | FDC | HW | CW | 56 | 30 | 11 | 3 | 26 | 34 | 25 | 115 | 98% | 1.18 | 17.5 |
| 21 | CW-GOOD-EBM-VQO | CW | HW | DR | 67 | 29 | 4 | 0 | 25 | 29 | 32 | 81 | 96% | 1.10 | 17.5 |
| 22 | CW-MED-EBM-VQO | CW | HW | FDC | 67 | 29 | 2 | 2 | 16 | 34 | 29 | 267 | 100% | 1.11 | 17.5 |
| 23 | CW-POOR-EBM-VQO | CW | HW | YC | 64 | 23 | 11 | 2 | 13 | 29 | 33 | 293 | 100% | 1.16 | 17.5 |
| 24 | HW/BA-GOOD-EBM-VQO | HW | CW | BA | 76 | 11 | 5 | 8 | 28 | 37 | 29 | 85 | 96% | 1.15 | 17.5 |
| 25 | HW/BA-MED-EBM-VQO | HW | CW | FDC | 69 | 14 | 10 | 7 | 23 | 31 | 32 | 92 | 98% | 1.15 | 17.5 |
| 26 | HW/BA-POOR-EBM-VQO | HW | CW | FDC | 66 | 19 | 9 | 6 | 17 | 31 | 37 | 151 | 100% | 1.16 | 17.5 |
| 27 | SS-EBM-VQO | SS | HW | FDC | 43 | 40 | 15 | 2 | 19 | 37 | 25 | 151 | 98% | 1.22 | 17.5 |
| 28 | DR-EBM-VQO | DR | HW | CW | 79 | 15 | 5 | 1 | 26 | 28 | 29 | 74 | 100% | 1.18 | 17.5 |

| Current Analysis Unit | Analysis Unit Description | Species 1 | Species 2 | Species 3 | Species 1 Percent | Species 2 Percent | Species 3 Percent | Other Species Percent | Crown Closure (%) | Inventory Site Index (m) | Height (m) | Total Age (yrs) | Conifer Proportion (%) | Volume Adjustment Factor | Utilization Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 | FDC-EBM-VQO | FDC | HW | CW | 54 | 35 | 8 | 3 | 24 | 35 | 34 | 129 | 99% | 1.11 | 17.5 |
| 42 | CW-MED-TOFDC-EBM | CW | HW | YC | 52 | 32 | 8 | 8 | 57 | 17 | 36 | 282 | 100% | 1.22 | 17.5 |
| 43 | CW-POOR-TOFDC-EBM | CW | HW | YC | 49 | 24 | 22 | 5 | 54 | 13 | 29 | 343 | 100% | 1.20 | 17.5 |
| 44 | HW/BA-GOOD-TOFDC-EBM | HW | CW | DR | 74 | 12 | 7 | 7 | 66 | 29 | 33 | 71 | 93% | 1.19 | 17.5 |
| 45 | HW/BA-MED-TOFDC-EBM | HW | CW | BA | 67 | 12 | 8 | 13 | 69 | 24 | 32 | 90 | 95% | 1.19 | 17.5 |
| 46 | HW/BA-POOR-TOFDC-EBM | HW | CW | BA | 63 | 16 | 12 | 9 | 63 | 16 | 32 | 187 | 99% | 1.21 | 17.5 |
| 47 | SS-TOFDC-EBM | SS | HW | CW | 58 | 22 | 9 | 11 | 56 | 23 | 44 | 169 | 100% | 1.26 | 17.5 |
| 48 | DR-TOFDC-EBM | DR | HW | FDC | 70 | 21 | 5 | 4 | 72 | 24 | 26 | 73 | 100% | 1.18 | 17.5 |
| 52 | CW-MED-TOFDC-EBM-VQO | CW | HW | FDC | 49 | 25 | 13 | 13 | 61 | 15 | 33 | 252 | 100% | 1.06 | 17.5 |
| 53 | CW-POOR-TOFDC-EBM-VQO | CW | HW | YC | 49 | 32 | 10 | 9 | 54 | 13 | 26 | 222 | 100% | 1.23 | 17.5 |
| 55 | HW/BA-MED-TOFDC-EBM-VQO | HW | FDC | SS | 68 | 20 | 11 | 1 | 68 | 21 | 39 | 165 | 100% | 1.26 | 17.5 |
| 56 | HW/BA-POOR-TOFDC-EBM-VQO | HW | FDC | CW | 58 | 19 | 15 | 8 | 67 | 16 | 31 | 169 | 100% | 1.20 | 17.5 |
| 57 | SS-TOFDC-EBM-VQO | SS | HW | FDC | 40 | 40 | 8 | 12 | 61 | 19 | 36 | 143 | 99% | 1.23 | 17.5 |
| 58 | DR-TOFDC-EBM-VQO | DR | HW | CW | 50 | 30 | 20 | 0 | 80 | 26 | 30 | 101 | 100% | 1.19 | 17.5 |
| 63 | CW-MARG-EBM | CW | YC | HW | 55 | 26 | 15 | 4 | 61 | 11 | 24 | 311 | 100% | 1.20 | 17.5 |
| 64 | HW/BA-MARG-EBM | HW | CW | BA | 51 | 20 | 15 | 14 | 60 | 13 | 30 | 258 | 100% | 1.18 | 17.5 |
| 65 | CW-MARG-EBM-VQO | CW | HW | YC | 67 | 18 | 11 | 4 | 62 | 11 | 24 | 291 | 100% | 1.19 | 17.5 |
| 66 | HW/BA-MARG-EBM-VQO | HW | CW | BA | 53 | 26 | 14 | 7 | 61 | 13 | 27 | 181 | 100% | 1.12 | 17.5 |
| 69 | CW-MARG-TOFDC-EBM | YC | CW | HW | 44 | 28 | 20 | 8 | 54 | 11 | 24 | 295 | 100% | 1.18 | 17.5 |
| 70 | HW/BA-MARG-TOFDC-EBM | HW | CW | BA | 60 | 21 | 12 | 7 | 58 | 13 | 30 | 238 | 100% | 1.24 | 17.5 |
| 72 | HW/BA-MARG-TOFDC-EBM-VQO | HW | CW | BA | 45 | 30 | 9 | 16 | 60 | 13 | 28 | 195 | 100% | 1.24 | 17.5 |

### *8.5.3 Existing Managed Stands - EBM*

**Table 51 – Input attributes for existing managed stands - EBM**

| Current AU | Regime # | Analysis Unit Description | Planted / Natural | Regen Delay (yrs) | Regime Percent | Species 1 | Species 1 Percent | Species 2 | Species 2 Percent | Species 3 | Species 3 Percent | Establishment Density (stems/ha) | OAF1 (%) | OAF2 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 111 | 1 | CW/CY-GOOD-EBM | P | 1 | 95% | CW | 80% | HW | 20% | | | 1000 | 15 | 5 |
| 111 | 2 | CW/CY-GOOD-EBM | N | 3 | 5% | HW | 60% | CW | 40% | | | 4000 | 15 | 5 |
| 112 | 1 | CW/CY-MED-EBM | P | 1 | 85% | CW | 80% | HW | 20% | | | 1000 | 15 | 5 |
| 112 | 2 | CW/CY-MED-EBM | N | 3 | 15% | HW | 60% | CW | 40% | | | 4000 | 15 | 5 |

| Current AU | Regime # | Analysis Unit Description | Planted / Natural | Regen Delay (yrs) | Regime Percent | Species 1 | Species 1 Percent | Species 2 | Species 2 Percent | Species 3 | Species 3 Percent | Establishment Density (stems/ha) | OAF1 (%) | OAF2 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 113 | 1 | CW/CY-POOR-EBM | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 15 | 5 |
| 113 | 2 | CW/CY-POOR-EBM | N | 3 | 35% | HW | 60% | CW | 40% | | | 4000 | 15 | 5 |
| 114 | 1 | HWC/BA-GOOD-EBM | P | 1 | 5% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15 | 5 |
| 114 | 2 | HWC/BA-GOOD-EBM | N | 3 | 95% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15 | 5 |
| 115 | 1 | HWC/BA-MED-EBM | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15 | 5 |
| 115 | 2 | HWC/BA-MED-EBM | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15 | 5 |
| 116 | 1 | HWC/BA-POOR-EBM | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15 | 5 |
| 116 | 2 | HWC/BA-POOR-EBM | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15 | 5 |
| 117 | 1 | SS-EBM | P | 2 | 70% | SS | 40% | BA | 40% | HW | 20% | 1000 | 15 | 5 |
| 117 | 2 | SS-EBM | N | 3 | 30% | HW | 40% | SS | 30% | BA | 30% | 5000 | 15 | 5 |
| 118 | 1 | DR-EBM | P | 2 | 75% | DR | 100% | | | | | 1000 | 15 | 5 |
| 118 | 2 | DR-EBM | P | 2 | 25% | CW | 100% | | | | | 1000 | 15 | 5 |
| 119 | 1 | ACT-EBM | P | 2 | 100% | ACT | 100% | | | | | 1000 | 15 | 5 |
| 120 | 1 | FDC-EBM | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 15 | 5 |
| 121 | 1 | CW/CY-GOOD-EBM-VQO | P | 1 | 95% | CW | 80% | HW | 20% | | | 1000 | 15 | 5 |
| 121 | 2 | CW/CY-GOOD-EBM-VQO | N | 3 | 5% | HW | 60% | CW | 40% | | | 4000 | 15 | 5 |
| 122 | 1 | CW/CY-MED-EBM-VQO | P | 1 | 85% | CW | 80% | HW | 20% | | | 1000 | 15 | 5 |
| 122 | 2 | CW/CY-MED-EBM-VQO | N | 3 | 15% | HW | 60% | CW | 40% | | | 4000 | 15 | 5 |
| 124 | 1 | HWC/BA-GOOD-EBM-VQO | P | 1 | 5% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15 | 5 |
| 124 | 2 | HWC/BA-GOOD-EBM-VQO | N | 3 | 95% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15 | 5 |
| 125 | 1 | HWC/BA-MED-EBM-VQO | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15 | 5 |
| 125 | 2 | HWC/BA-MED-EBM-VQO | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15 | 5 |
| 128 | 1 | DR-EBM-VQO | P | 2 | 75% | DR | 100% | | | | | 1000 | 15 | 5 |
| 128 | 2 | DR-EBM-VQO | P | 2 | 25% | CW | 100% | | | | | 1000 | 15 | 5 |
| 130 | 1 | FDC-EBM-VQO | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 15 | 5 |
| 141 | 1 | CW/CY-GOOD-TOFDC-EBM | P | 1 | 95% | CW | 80% | HW | 20% | 0 | 0% | 1000 | 15 | 5 |
| 141 | 2 | CW/CY-GOOD-TOFDC-EBM | N | 3 | 5% | HW | 60% | CW | 40% | 0 | 0% | 4000 | 15 | 5 |
| 144 | 1 | HWC/BA-GOOD-TOFDC-EBM | P | 1 | 5% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15 | 5 |
| 144 | 2 | HWC/BA-GOOD-TOFDC-EBM | N | 3 | 95% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15 | 5 |
| 145 | 1 | HWC/BA-MED-TOFDC-EBM | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15 | 5 |
| 145 | 2 | HWC/BA-MED-TOFDC-EBM | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15 | 5 |
| 146 | 1 | HWC/BA-POOR-TOFDC-EBM | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15 | 5 |
| 146 | 2 | HWC/BA-POOR-TOFDC-EBM | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15 | 5 |
| 147 | 1 | SS-TOFDC-EBM | P | 2 | 70% | SS | 40% | BA | 40% | HW | 20% | 1000 | 15 | 5 |
| 147 | 2 | SS-TOFDC-EBM | N | 3 | 30% | HW | 40% | SS | 30% | BA | 30% | 5000 | 15 | 5 |
| 148 | 1 | DR-TOFDC-EBM | P | 2 | 75% | DR | 100% | | | | | 1000 | 15 | 5 |
| 148 | 2 | DR-TOFDC-EBM | P | 2 | 25% | CW | 100% | | | | | 1000 | 15 | 5 |
| 151 | 1 | CW/CY-GOOD-TOFDC-EBM-VQO | P | 1 | 95% | CW | 80% | HW | 20% | | | 1000 | 15 | 5 |

| Current AU | Regime # | Analysis Unit Description | Planted / Natural | Regen Delay (yrs) | Regime Percent | Species 1 | Species 1 Percent | Species 2 | Species 2 Percent | Species 3 | Species 3 Percent | Establishment Density (stems/ha) | OAF1 (%) | OAF2 (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 151 | 2 | CW/CY-GOOD-TOFDC-EBM-VQO | N | 3 | 5% | HW | 60% | CW | 40% | | | 4000 | 15 | 5 |
| 154 | 1 | HWC/BA-GOOD-TOFDC-EBM-VQO | P | 1 | 5% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15 | 5 |
| 154 | 2 | HWC/BA-GOOD-TOFDC-EBM-VQO | N | 3 | 95% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15 | 5 |
| 155 | 1 | HWC/BA-MED-TOFDC-EBM-VQO | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15 | 5 |
| 155 | 2 | HWC/BA-MED-TOFDC-EBM-VQO | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15 | 5 |
| 158 | 1 | DR-TOFDC-EBM-VQO | P | 2 | 75% | DR | 100% | | | | | 1000 | 15 | 5 |
| 158 | 2 | DR-TOFDC-EBM-VQO | P | 2 | 25% | CW | 100% | | | | | 1000 | 15 | 5 |
| 163 | 1 | CW/CY-MARG-EBM | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 15 | 5 |
| 163 | 2 | CW/CY-MARG-EBM | N | 3 | 35% | HW | 60% | CW | 40% | | | 4000 | 15 | 5 |
| 164 | 1 | HWC/BA-MARG-EBM | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 15 | 5 |
| 164 | 2 | HWC/BA-MARG-EBM | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 15 | 5 |

### *8.5.4 Future Managed Stands - EBM*

In modelling future managed stands, operational adjustment factors are unchanged from the Pre-EBM analysis (OAF1 = 15% and OAF2 = 5%). Table 52 lists the silviculture input regimes for MSYTs.

**Table 52 – Silviculture regimes for future managed stands - EBM**

| Future Analysis Unit | Regime # | Analysis Unit Description | Planted / Natura | Regeneratin Delay (yrs) | Regime Percent | Species 1 | Species 1 Percent | Species 2 | Species 2 Percent | Species 3 | Species 3 Percent | Establishment Density (stems/ha) | Genetic Gain Species 1 | Genetic Gain Species 2 | Genetic Gain Species 3 | EBM retention % | EBM %dispersed | EBM % Aggregate | Residual Stand Ht (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 211 | 1 | CW/CY-GOOD-EBM | P | 1 | 95% | CW | 80% | HW | 20% | | | 1000 | 3% | 0% | 0% | | | | |
| 211 | 2 | CW/CY-GOOD-EBM | N | 3 | 5% | HW | 60% | CW | 40% | | | 4000 | 0% | 0% | 0% | | | | |
| 212 | 1 | CW/CY-MED-EBM | P | 1 | 85% | CW | 80% | HW | 20% | | | 1000 | 3% | 0% | 0% | | | | |
| 212 | 2 | CW/CY-MED-EBM | N | 3 | 15% | HW | 60% | CW | 40% | | | 4000 | 0% | 0% | 0% | | | | |
| 213 | 1 | CW/CY-POOR-EBM | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 3% | 0% | 0% | | | | |
| 213 | 2 | CW/CY-POOR-EBM | N | 3 | 35% | HW | 60% | CW | 40% | | | 4000 | 0% | 0% | 0% | | | | |
| 214 | 1 | HWC/BA-GOOD-EBM | P | 1 | 3% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | 10% | 5% | 95% | 30 |
| 214 | 2 | HWC/BA-GOOD-EBM | N | 3 | 57% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | 10% | 5% | 95% | 30 |
| 214 | 3 | HWC/BA-GOOD-EBM | P | 1 | 2% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | | | | |
| 214 | 4 | HWC/BA-GOOD-EBM | N | 3 | 38% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | | | | |
| 215 | 1 | HWC/BA-MED-EBM | P | 1 | 18% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | 10% | 5% | 95% | 30 |
| 215 | 2 | HWC/BA-MED-EBM | N | 3 | 42% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | 10% | 5% | 95% | 30 |

| Future Analysis Unit | Regime # | Analysis Unit Description | Planted / Natura | Regeneratin Delay (yrs) | Regime Percent | Species 1 | Species 1 Percent | Species 2 | Species 2 Percent | Species 3 | Species 3 Percent | Establishment Density (stems/ha) | Genetic Gain Species 1 | Genetic Gain Species 2 | Genetic Gain Species 3 | EBM retention % | EBM %dispersed | EBM % Aggregate | Residual Stand Ht (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 215 | 3 | HWC/BA-MED-EBM | P | 1 | 12% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | | | | |
| 215 | 4 | HWC/BA-MED-EBM | N | 3 | 28% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | | | | |
| 216 | 1 | HWC/BA-POOR-EBM | P | 1 | 18% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | 10% | 5% | 95% | 30 |
| 216 | 2 | HWC/BA-POOR-EBM | N | 3 | 42% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | 10% | 5% | 95% | 30 |
| 216 | 3 | HWC/BA-POOR-EBM | P | 1 | 12% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | | | | |
| 216 | 4 | HWC/BA-POOR-EBM | N | 3 | 28% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | | | | |
| 217 | 1 | SS-EBM | P | 2 | 70% | SS | 40% | BA | 40% | HW | 20% | 1000 | 0% | 0% | 0% | | | | |
| 217 | 2 | SS-EBM | N | 3 | 30% | HW | 40% | SS | 30% | BA | 30% | 5000 | 0% | 0% | 0% | | | | |
| 218 | 1 | DR-EBM | P | 2 | 75% | DR | 100% | | | | | 1000 | 0% | 0% | 0% | | | | |
| 218 | 2 | DR-EBM | P | 2 | 25% | CW | 100% | | | | | 1000 | 3% | 0% | 0% | | | | |
| 219 | 1 | ACT-EBM | P | 2 | 100% | ACT | 100% | | | | | 1000 | 0% | 0% | 0% | | | | |
| 220 | 1 | FDC-EBM | P | 1 | 60% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 10% | 5% | 95% | 30 |
| 220 | 2 | FDC-EBM | P | 1 | 40% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | | | | |
| 221 | 1 | CW/CY-GOOD-EBM-VQO | P | 1 | 95% | CW | 80% | HW | 20% | | | 1000 | 3% | 0% | 0% | | | | |
| 221 | 2 | CW/CY-GOOD-EBM-VQO | N | 3 | 5% | HW | 60% | CW | 40% | | | 4000 | 0% | 0% | 0% | | | | |
| 222 | 1 | CW/CY-MED-EBM-VQO | P | 1 | 85% | CW | 80% | HW | 20% | | | 1000 | 3% | 0% | 0% | | | | |
| 222 | 2 | CW/CY-MED-EBM-VQO | N | 3 | 15% | HW | 60% | CW | 40% | | | 4000 | 0% | 0% | 0% | | | | |
| 223 | 1 | CW/CY-POOR-EBM-VQO | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 3% | 0% | 0% | | | | |
| 223 | 2 | CW/CY-POOR-EBM-VQO | N | 3 | 35% | HW | 60% | CW | 40% | | | 4000 | 0% | 0% | 0% | | | | |
| 224 | 1 | HWC/BA-GOOD-EBM-VQO | P | 1 | 5% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | 40% | 20% | 80% | 30 |
| 224 | 2 | HWC/BA-GOOD-EBM-VQO | N | 3 | 95% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | 40% | 20% | 80% | 30 |
| 225 | 1 | HWC/BA-MED-EBM-VQO | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | 40% | 20% | 80% | 30 |
| 225 | 2 | HWC/BA-MED-EBM-VQO | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | 40% | 20% | 80% | 30 |
| 226 | 1 | HWC/BA-POOR-EBM-VQO | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | 40% | 20% | 80% | 30 |
| 226 | 2 | HWC/BA-POOR-EBM-VQO | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | 40% | 20% | 80% | 30 |
| 227 | 1 | SS-EBM-VQO | P | 2 | 70% | SS | 40% | BA | 40% | HW | 20% | 1000 | 0% | 0% | 0% | | | | |
| 227 | 2 | SS-EBM-VQO | N | 3 | 30% | HW | 40% | SS | 30% | BA | 30% | 5000 | 0% | 0% | 0% | | | | |
| 228 | 1 | DR-EBM-VQO | P | 2 | 75% | DR | 100% | | | | | 1000 | 0% | 0% | 0% | | | | |
| 228 | 2 | DR-EBM-VQO | P | 2 | 25% | CW | 100% | | | | | 1000 | 3% | 0% | 0% | | | | |
| 230 | 1 | FDC-EBM-VQO | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 40% | 20% | 80% | 30 |
| 242 | 1 | CW/CY-MED-TOFDC-EBM | P | 1 | 60% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 10% | 5% | 95% | 30 |
| 242 | 2 | CW/CY-MED-TOFDC-EBM | P | 1 | 40% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | | | | |
| 243 | 1 | CW/CY-POOR-TOFDC-EBM | P | 1 | 60% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 10% | 5% | 95% | 30 |
| 243 | 2 | CW/CY-POOR-TOFDC-EBM | P | 1 | 40% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | | | | |
| 244 | 1 | HWC/BA-GOOD-TOFDC-EBM | P | 1 | 60% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 10% | 5% | 95% | 30 |
| 244 | 2 | HWC/BA-GOOD-TOFDC-EBM | P | 1 | 40% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | | | | |
| 245 | 1 | HWC/BA-MED-TOFDC-EBM | P | 1 | 60% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 10% | 5% | 95% | 30 |
| 245 | 2 | HWC/BA-MED-TOFDC-EBM | P | 1 | 40% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | | | | |

| Future Analysis Unit | Regime # | Analysis Unit Description | Planted / Natura | Regeneratin Delay (yrs) | Regime Percent | Species 1 | Species 1 Percent | Species 2 | Species 2 Percent | Species 3 | Species 3 Percent | Establishment Density (stems/ha) | Genetic Gain Species 1 | Genetic Gain Species 2 | Genetic Gain Species 3 | EBM retention % | EBM %dispersed | EBM % Aggregate | Residual Stand Ht (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 246 | 1 | HWC/BA-POOR-TOFDC-EBM | P | 1 | 60% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 10% | 5% | 95% | 30 |
| 246 | 2 | HWC/BA-POOR-TOFDC-EBM | P | 1 | 40% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | | | | |
| 247 | 1 | SS-TOFDC-EBM | P | 1 | 60% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 10% | 5% | 95% | 30 |
| 247 | 2 | SS-TOFDC-EBM | P | 1 | 40% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | | | | |
| 248 | 1 | DR-TOFDC-EBM | P | 1 | 60% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 10% | 5% | 95% | 30 |
| 248 | 2 | DR-TOFDC-EBM | P | 1 | 40% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | | | | |
| 249 | 1 | ACT-TOFDC-EBM | P | 1 | 60% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 10% | 5% | 95% | 30 |
| 249 | 2 | ACT-TOFDC-EBM | P | 1 | 40% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | | | | |
| 252 | 1 | CW/CY-MED-TOFDC-EBM-VQO | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 40% | 20% | 80% | 30 |
| 253 | 1 | CW/CY-POOR-TOFDC-EBM-VQO | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 40% | 20% | 80% | 30 |
| 255 | 1 | HWC/BA-MED-TOFDC-EBM-VQO | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 40% | 20% | 80% | 30 |
| 256 | 1 | HWC/BA-POOR-TOFDC-EBM-VQO | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 40% | 20% | 80% | 30 |
| 257 | 1 | SS-TOFDC-EBM-VQO | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 40% | 20% | 80% | 30 |
| 258 | 1 | DR-TOFDC-EBM-VQO | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 40% | 20% | 80% | 30 |
| 263 | 1 | CW/CY-MARG-EBM | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 3% | 0% | 0% | | | | |
| 263 | 2 | CW/CY-MARG-EBM | N | 3 | 35% | HW | 60% | CW | 40% | | | 4000 | 0% | 0% | 0% | | | | |
| 264 | 1 | HWC/BA-MARG-EBM | P | 1 | 18% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | 10% | 5% | 95% | 30 |
| 264 | 2 | HWC/BA-MARG-EBM | N | 3 | 42% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | 10% | 5% | 95% | 30 |
| 264 | 3 | HWC/BA-MARG-EBM | P | 1 | 12% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | | | | |
| 264 | 4 | HWC/BA-MARG-EBM | N | 3 | 28% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | | | | |
| 265 | 1 | CW/CY-MARG-EBM-VQO | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 3% | 0% | 0% | | | | |
| 265 | 2 | CW/CY-MARG-EBM-VQO | N | 3 | 35% | HW | 60% | CW | 40% | | | 4000 | 0% | 0% | 0% | | | | |
| 266 | 1 | HWC/BA-MARG-EBM-VQO | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | 40% | 20% | 80% | 30 |
| 266 | 2 | HWC/BA-MARG-EBM-VQO | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | 40% | 20% | 80% | 30 |
| 269 | 1 | CW/CY-MARG-TOFDC-EBM | P | 1 | 60% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 10% | 5% | 95% | 30 |
| 269 | 2 | CW/CY-MARG-TOFDC-EBM | P | 1 | 40% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | | | | |
| 270 | 1 | HWC/BA-MARG-TOFDC-EBM | P | 1 | 60% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 10% | 5% | 95% | 30 |
| 270 | 2 | HWC/BA-MARG-TOFDC-EBM | P | 1 | 40% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | | | | |
| 272 | 1 | HWC/BA-MARG-TOFDC-EBM-VQO | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 40% | 20% | 80% | 30 |
| 311 | 1 | CW/CY-GOOD-EBM | P | 1 | 95% | CW | 80% | HW | 20% | | | 1000 | 3% | 0% | 0% | | | | |
| 311 | 2 | CW/CY-GOOD-EBM | N | 3 | 5% | HW | 60% | CW | 40% | | | 4000 | 0% | 0% | 0% | | | | |
| 312 | 1 | CW/CY-MED-EBM | P | 1 | 85% | CW | 80% | HW | 20% | | | 1000 | 3% | 0% | 0% | | | | |
| 312 | 2 | CW/CY-MED-EBM | N | 3 | 15% | HW | 60% | CW | 40% | | | 4000 | 0% | 0% | 0% | | | | |
| 313 | 1 | CW/CY-POOR-EBM | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 3% | 0% | 0% | | | | |
| 313 | 2 | CW/CY-POOR-EBM | N | 3 | 35% | HW | 60% | CW | 40% | | | 4000 | 0% | 0% | 0% | | | | |
| 314 | 1 | HWC/BA-GOOD-EBM | P | 1 | 3% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | 10% | 5% | 95% | 30 |
| 314 | 2 | HWC/BA-GOOD-EBM | N | 3 | 57% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | 10% | 5% | 95% | 30 |
| 314 | 3 | HWC/BA-GOOD-EBM | P | 1 | 2% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | | | | |

| Future Analysis Unit | Regime # | Analysis Unit Description | Planted / Natura | Regeneratin Delay (yrs) | Regime Percent | Species 1 | Species 1 Percent | Species 2 | Species 2 Percent | Species 3 | Species 3 Percent | Establishment Density (stems/ha) | Genetic Gain Species 1 | Genetic Gain Species 2 | Genetic Gain Species 3 | EBM retention % | EBM %dispersed | EBM % Aggregate | Residual Stand Ht (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 314 | 4 | HWC/BA-GOOD-EBM | N | 3 | 38% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | | | | |
| 315 | 1 | HWC/BA-MED-EBM | P | 1 | 18% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | 10% | 5% | 95% | 30 |
| 315 | 2 | HWC/BA-MED-EBM | N | 3 | 42% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | 10% | 5% | 95% | 30 |
| 315 | 3 | HWC/BA-MED-EBM | P | 1 | 12% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | | | | |
| 315 | 4 | HWC/BA-MED-EBM | N | 3 | 28% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | | | | |
| 316 | 1 | HWC/BA-POOR-EBM | P | 1 | 18% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | 10% | 5% | 95% | 30 |
| 316 | 2 | HWC/BA-POOR-EBM | N | 3 | 42% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | 10% | 5% | 95% | 30 |
| 316 | 3 | HWC/BA-POOR-EBM | P | 1 | 12% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | | | | |
| 316 | 4 | HWC/BA-POOR-EBM | N | 3 | 28% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | | | | |
| 317 | 1 | SS-EBM | P | 2 | 70% | SS | 40% | BA | 40% | HW | 20% | 1000 | 0% | 0% | 0% | | | | |
| 317 | 2 | SS-EBM | N | 3 | 30% | HW | 40% | SS | 30% | BA | 30% | 5000 | 0% | 0% | 0% | | | | |
| 318 | 1 | DR-EBM | P | 2 | 75% | DR | 100% | | | | | 1000 | 0% | 0% | 0% | | | | |
| 318 | 2 | DR-EBM | P | 2 | 25% | CW | 100% | | | | | 1000 | 3% | 0% | 0% | | | | |
| 319 | 1 | ACT-EBM | P | 2 | 100% | ACT | 100% | | | | | 1000 | 0% | 0% | 0% | | | | |
| 320 | 1 | FDC-EBM | P | 1 | 60% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 10% | 5% | 95% | 30 |
| 320 | 2 | FDC-EBM | P | 1 | 40% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | | | | |
| 321 | 1 | CW/CY-GOOD-EBM-VQO | P | 1 | 95% | CW | 80% | HW | 20% | | | 1000 | 3% | 0% | 0% | | | | |
| 321 | 2 | CW/CY-GOOD-EBM-VQO | N | 3 | 5% | HW | 60% | CW | 40% | | | 4000 | 0% | 0% | 0% | | | | |
| 322 | 1 | CW/CY-MED-EBM-VQO | P | 1 | 85% | CW | 80% | HW | 20% | | | 1000 | 3% | 0% | 0% | | | | |
| 322 | 2 | CW/CY-MED-EBM-VQO | N | 3 | 15% | HW | 60% | CW | 40% | | | 4000 | 0% | 0% | 0% | | | | |
| 324 | 1 | HWC/BA-GOOD-EBM-VQO | P | 1 | 5% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | 40% | 20% | 80% | 30 |
| 324 | 2 | HWC/BA-GOOD-EBM-VQO | N | 3 | 95% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | 40% | 20% | 80% | 30 |
| 325 | 1 | HWC/BA-MED-EBM-VQO | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | 40% | 20% | 80% | 30 |
| 325 | 2 | HWC/BA-MED-EBM-VQO | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | 40% | 20% | 80% | 30 |
| 326 | 1 | HWC/BA-POOR-EBM-VQO | P | 1 | 30% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | 40% | 20% | 80% | 30 |
| 326 | 2 | HWC/BA-POOR-EBM-VQO | N | 3 | 70% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | 40% | 20% | 80% | 30 |
| 341 | 1 | CW/CY-GOOD-TOFDC-EBM | P | 1 | 60% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 10% | 5% | 95% | 30 |
| 341 | 2 | CW/CY-GOOD-TOFDC-EBM | P | 1 | 40% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | | | | |
| 342 | 1 | CW/CY-MED-TOFDC-EBM | P | 1 | 60% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 10% | 5% | 95% | 30 |
| 342 | 2 | CW/CY-MED-TOFDC-EBM | P | 1 | 40% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | | | | |
| 343 | 1 | CW/CY-POOR-TOFDC-EBM | P | 1 | 60% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 10% | 5% | 95% | 30 |
| 343 | 2 | CW/CY-POOR-TOFDC-EBM | P | 1 | 40% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | | | | |
| 344 | 1 | HWC/BA-GOOD-TOFDC-EBM | P | 1 | 60% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 10% | 5% | 95% | 30 |
| 344 | 2 | HWC/BA-GOOD-TOFDC-EBM | P | 1 | 40% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | | | | |
| 345 | 1 | HWC/BA-MED-TOFDC-EBM | P | 1 | 60% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 10% | 5% | 95% | 30 |
| 345 | 2 | HWC/BA-MED-TOFDC-EBM | P | 1 | 40% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | | | | |
| 346 | 1 | HWC/BA-POOR-TOFDC-EBM | P | 1 | 60% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 10% | 5% | 95% | 30 |
| 346 | 2 | HWC/BA-POOR-TOFDC-EBM | P | 1 | 40% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | | | | |

| Future Analysis Unit | Regime # | Analysis Unit Description | Planted / Natura | Regeneratin Delay (yrs) | Regime Percent | Species 1 | Species 1 Percent | Species 2 | Species 2 Percent | Species 3 | Species 3 Percent | Establishment Density (stems/ha) | Genetic Gain Species 1 | Genetic Gain Species 2 | Genetic Gain Species 3 | EBM retention % | EBM %dispersed | EBM % Aggregate | Residual Stand Ht (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 347 | 1 | SS-TOFDC-EBM | P | 1 | 60% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 10% | 5% | 95% | 30 |
| 347 | 2 | SS-TOFDC-EBM | P | 1 | 40% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | | | | |
| 348 | 1 | DR-TOFDC-EBM | P | 1 | 60% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 10% | 5% | 95% | 30 |
| 348 | 2 | DR-TOFDC-EBM | P | 1 | 40% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | | | | |
| 351 | 1 | CW/CY-GOOD-TOFDC-EBM-VQO | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 40% | 20% | 80% | 30 |
| 354 | 1 | HWC/BA-GOOD-TOFDC-EBM-VQO | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 40% | 20% | 80% | 30 |
| 355 | 1 | HWC/BA-MED-TOFDC-EBM-VQO | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 40% | 20% | 80% | 30 |
| 358 | 1 | DR-TOFDC-EBM-VQO | P | 1 | 100% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 40% | 20% | 80% | 30 |
| 363 | 1 | CW/CY-MARG-EBM | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 3% | 0% | 0% | | | | |
| 363 | 2 | CW/CY-MARG-EBM | N | 3 | 35% | HW | 60% | CW | 40% | | | 4000 | 0% | 0% | 0% | | | | |
| 364 | 1 | HWC/BA-MARG-EBM | P | 1 | 18% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | 10% | 5% | 95% | 30 |
| 364 | 2 | HWC/BA-MARG-EBM | N | 3 | 42% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | 10% | 5% | 95% | 30 |
| 364 | 3 | HWC/BA-MARG-EBM | P | 1 | 12% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | | | | |
| 364 | 4 | HWC/BA-MARG-EBM | N | 3 | 28% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | | | | |
| 411 | 1 | CW/CY-GOOD-EBM | P | 1 | 95% | CW | 80% | HW | 20% | | | 1000 | 3% | 0% | 0% | | | | |
| 411 | 2 | CW/CY-GOOD-EBM | N | 3 | 5% | HW | 60% | CW | 40% | | | 4000 | 0% | 0% | 0% | | | | |
| 412 | 1 | CW/CY-MED-EBM | P | 1 | 85% | CW | 80% | HW | 20% | | | 1000 | 3% | 0% | 0% | | | | |
| 412 | 2 | CW/CY-MED-EBM | N | 3 | 15% | HW | 60% | CW | 40% | | | 4000 | 0% | 0% | 0% | | | | |
| 413 | 1 | CW/CY-POOR-EBM | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 3% | 0% | 0% | | | | |
| 413 | 2 | CW/CY-POOR-EBM | N | 3 | 35% | HW | 60% | CW | 40% | | | 4000 | 0% | 0% | 0% | | | | |
| 414 | 1 | HWC/BA-GOOD-EBM | P | 1 | 3% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | 10% | 5% | 95% | 30 |
| 414 | 2 | HWC/BA-GOOD-EBM | N | 3 | 57% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | 10% | 5% | 95% | 30 |
| 414 | 3 | HWC/BA-GOOD-EBM | P | 1 | 2% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | | | | |
| 414 | 4 | HWC/BA-GOOD-EBM | N | 3 | 38% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | | | | |
| 415 | 1 | HWC/BA-MED-EBM | P | 1 | 18% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | 10% | 5% | 95% | 30 |
| 415 | 2 | HWC/BA-MED-EBM | N | 3 | 42% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | 10% | 5% | 95% | 30 |
| 415 | 3 | HWC/BA-MED-EBM | P | 1 | 12% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | | | | |
| 415 | 4 | HWC/BA-MED-EBM | N | 3 | 28% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | | | | |
| 416 | 1 | HWC/BA-POOR-EBM | P | 1 | 18% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | 10% | 5% | 95% | 30 |
| 416 | 2 | HWC/BA-POOR-EBM | N | 3 | 42% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | 10% | 5% | 95% | 30 |
| 416 | 3 | HWC/BA-POOR-EBM | P | 1 | 12% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | | | | |
| 416 | 4 | HWC/BA-POOR-EBM | N | 3 | 28% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | | | | |
| 419 | 1 | ACT-EBM | P | 2 | 100% | ACT | 100% | | | | | 1000 | 0% | 0% | 0% | | | | |
| 420 | 1 | FDC-EBM | P | 1 | 60% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | 10% | 5% | 95% | 30 |
| 420 | 2 | FDC-EBM | P | 1 | 40% | FDC | 40% | HW | 40% | CW | 20% | 1000 | 3% | 0% | 3% | | | | |
| 421 | 1 | CW/CY-GOOD-EBM-VQO | P | 1 | 95% | CW | 80% | HW | 20% | | | 1000 | 3% | 0% | 0% | | | | |
| 421 | 2 | CW/CY-GOOD-EBM-VQO | N | 3 | 5% | HW | 60% | CW | 40% | | | 4000 | 0% | 0% | 0% | | | | |
| 422 | 1 | CW/CY-MED-EBM-VQO | P | 1 | 85% | CW | 80% | HW | 20% | | | 1000 | 3% | 0% | 0% | | | | |

| Future Analysis Unit | Regime # | Analysis Unit Description | Planted / Natura | Regeneratin Delay (yrs) | Regime Percent | Species 1 | Species 1 Percent | Species 2 | Species 2 Percent | Species 3 | Species 3 Percent | Establishment Density (stems/ha) | Genetic Gain Species 1 | Genetic Gain Species 2 | Genetic Gain Species 3 | EBM retention % | EBM %dispersed | EBM % Aggregate | Residual Stand Ht (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 422 | 2 | CW/CY-MED-EBM-VQO | N | 3 | 15% | HW | 60% | CW | 40% | | | 4000 | 0% | 0% | 0% | | | | |
| 423 | 1 | CW/CY-POOR-EBM-VQO | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 3% | 0% | 0% | | | | |
| 423 | 2 | CW/CY-POOR-EBM-VQO | N | 3 | 35% | HW | 60% | CW | 40% | | | 4000 | 0% | 0% | 0% | | | | |
| 424 | 1 | HWC/BA-GOOD-EBM-VQO | P | 1 | 5% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | 40% | 20% | 80% | 30 |
| 424 | 2 | HWC/BA-GOOD-EBM-VQO | N | 3 | 95% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | 40% | 20% | 80% | 30 |
| 463 | 1 | CW/CY-MARG-EBM | P | 2 | 65% | CW | 80% | HW | 20% | | | 1000 | 3% | 0% | 0% | | | | |
| 463 | 2 | CW/CY-MARG-EBM | N | 3 | 35% | HW | 60% | CW | 40% | | | 4000 | 0% | 0% | 0% | | | | |
| 464 | 1 | HWC/BA-MARG-EBM | P | 1 | 18% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | 10% | 5% | 95% | 30 |
| 464 | 2 | HWC/BA-MARG-EBM | N | 3 | 42% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | 10% | 5% | 95% | 30 |
| 464 | 3 | HWC/BA-MARG-EBM | P | 1 | 12% | CW | 40% | HW | 40% | BA | 20% | 1200 | 3% | 0% | 0% | | | | |
| 464 | 4 | HWC/BA-MARG-EBM | N | 3 | 28% | HW | 60% | BA | 20% | CW | 20% | 5000 | 0% | 0% | 0% | | | | |

# 9.0 INTEGRATED RESOURCE MANAGEMENT

## 9.1 Forest Cover Objectives – Rationale

Forest cover objectives place maximum and/or minimum limits on the amount of young, mature and/or old growth found in land base aggregates such as combinations of landscape units and ecosystem units or resource emphasis areas. Three classes of forest cover constraints can be modelled to capture these management objectives within management zones:

1. Disturbance: the maximum area that can be younger than a specified age or shorter than a specified height. This is intended to model cutblock adjacency and green-up requirements.
2. Old-growth Retention: the minimum area that must be older than, or as old as, a specified age. This is intended to model both retention of cover and retention of old growth.
3. Mature Retention: the minimum proportion of area that must be retained over a lower retention age. This is intended to model thermal cover for wildlife or mature biodiversity requirements. Mature and old growth retention forest cover objectives may overlap and area that qualifies for both is counted in both.

## 9.2 Pre-EBM Objectives

### *9.2.1 Cut-Block Adjacency , Maximum Disturbance and Minimum Retention*

Visual quality is maintained by limiting the rate of harvest in areas that are identified as visually sensitive in the Visual Landscape Inventory. Each polygon has a forest cover constraint applied to it, depending on its visual quality objective and Visual Absorption Capacity (VAC). The forest cover constraint specifies the maximum area that can be below the specified green-up height at any point in time. In the analysis, harvesting will not occur within a VQO polygon in any period when doing so would violate this constraint.

Areas outside the VQO polygons are assigned a disturbance constraint designed to mimic cut-block adjacency. The Enhanced Zones of the VILUP portion of the TSA have a reduced green-up requirement to permit additional harvesting activity.

Minimum retention constraints are necessary to ensure sufficient old forest is maintained within the VILUP Special Management Zones.

Table 53 summarizes the disturbance and retention forest cover constraints for the management zones defined for management under Pre-EBM rules.

**Table 53 – Forest cover requirements for disturbance and mature retention**

| Objective | Visual Absorption Capacity | Green-up Height (metres) | Maximum Area Below Green-up (%) | Minimum Retention (% > years) | Land Base Component |
|---|---|---|---|---|---|
| Visual Quality – Preservation | L | 5.0 | 0.0 | | Productive |
| | M | 5.0 | 0.5 | | |
| | H | 5.0 | 1.0 | | |
| Visual Quality – Retention | L | 5.0 | 1.1 | | Productive |
| | M | 5.0 | 3.0 | | |
| | H | 5.0 | 5.0 | | |
| Visual Quality – Partial Retention | L | 5.0 | 5.1 | | Productive |
| | M | 5.0 | 10.0 | | |
| | H | 5.0 | 15.0 | | |
| Visual Quality – Modification | L | 5.0 | 15.1 | | Productive |
| | M | 5.0 | 20.0 | | |
| | H | 5.0 | 25.0 | | |
| VILUP – Enhanced Zones | n/a | 1.3 | 25.0 | | THLB |
| Integrated Resource Management | n/a | 3.0 | 25.0 | | THLB |
| VILUP – Special MZ 1, 2, 3 | | | | 25% > 140 | Productive |
| VILUP – Special MZ 7 | | | | 30% > 140 | Productive |

### *9.2.2 Landscape Level Biodiversity*

For TSR 2 analysis, landscape level biodiversity objectives were met by applying cover constraints based on VILUP and the *Biodiversity Guidebook*. Since then, old growth management areas have been established in five landscape units (see Section 5.1.15). These OGMAs have been netted out of the timber harvesting land base, replacing the *Biodiversity Guidebook* targets for the corresponding landscape units. In the balance of the Landscape Units, old seral constraints, as defined through legislation in the Order Establishing Provincial Non-spatial Old Growth Objectives (June 30, 2004), will be applied at the LU/BEC variant level based on the biodiversity emphasis option (BEO) and BEC natural disturbance type (NDT). Old growth seral constraint zones are summarized in Table 54. *Biodiversity Guidebook* old growth seral constraints for these zones are listed in Table 55. All of the productive forest is considered in applying these constraints.

In the EBM analysis, these aspatial targets will be replaced in the EBM zone with the biodiversity objectives set out in the Order (see Section 9.3.3).

**Table 54 – Old growth seral constraint zones**

| Landscape Unit | | BEO | BEC | |
|---|---|---|---|---|
| **Number** | **Name** | | | |
| 1 | Adam-Eve | Low | CMA | Unp |
| 2 | Ahnuhati-kwalate | High | CMA | Unp |
| 2 | Ahnuhati-kwalate | High | CWH | vm 1 |
| 2 | Ahnuhati-kwalate | High | CWH | vm 2 |
| 2 | Ahnuhati-kwalate | High | MH | mm 1 |
| 3 | Ahta | High | CMA | Unp |
| 3 | Ahta | High | CWH | vm 1 |
| 3 | Ahta | High | CWH | vm 2 |
| 3 | Ahta | High | MH | mm 1 |
| 4 | Allison | Low | CWH | vh 1 |
| 5 | Artlish | Intermediate | CMA | Unp |
| 5 | Artlish | Intermediate | CWH | vm 2 |
| 5 | Artlish | Intermediate | MH | mm 1 |
| 6 | Belize | Intermediate | CMA | Unp |
| 6 | Belize | Intermediate | CWH | vh 1 |
| 6 | Belize | Intermediate | CWH | vm 1 |
| 6 | Belize | Intermediate | CWH | vm 2 |
| 6 | Belize | Intermediate | MH | mm 1 |
| 7 | Bonanza | Intermediate | CMA | Unp |
| 7 | Bonanza | Intermediate | CWH | vm 1 |
| 7 | Bonanza | Intermediate | CWH | vm 2 |
| 7 | Bonanza | Intermediate | MH | mm 1 |
| 8 | Brooks | Low | CWH | vh 1 |
| 9 | Broughton | Low | CWH | vm 1 |
| 10 | Charles | Intermediate | CMA | Unp |
| 10 | Charles | Intermediate | CWH | vm 1 |
| 10 | Charles | Intermediate | CWH | vm 2 |
| 10 | Charles | Intermediate | MH | mm 1 |
| 11 | Franklin | High | CMA | Unp |
| 11 | Franklin | High | CWH | Dm |
| 11 | Franklin | High | CWH | vm 1 |
| 11 | Franklin | High | CWH | vm 2 |
| 11 | Franklin | High | MH | mm 1 |
| 12 | Fulmore | Intermediate | CMA | Unp |
| 12 | Fulmore | Intermediate | CWH | vm 1 |
| 12 | Fulmore | Intermediate | CWH | vm 2 |
| 12 | Fulmore | Intermediate | MH | mm 1 |
| 13 | Gilford | Low | CMA | Unp |
| 13 | Gilford | Low | CWH | vm 1 |

| Landscape Unit | | BEO | BEC | |
|---|---|---|---|---|
| **Number** | **Name** | | | |
| 13 | Gilford | Low | CWH | vm 2 |
| 13 | Gilford | Low | MH | mm 1 |
| 14 | Holberg | Low | CWH | vh 1 |
| 14 | Holberg | Low | CWH | vm 1 |
| 15 | Homathko | High | CMA | Unp |
| 16 | Huaskin | Intermediate | CWH | vh 1 |
| 16 | Huaskin | Intermediate | CWH | vm 1 |
| 16 | Huaskin | Intermediate | CWH | vm 2 |
| 16 | Huaskin | Intermediate | MH | mm 1 |
| 17 | Kakweiken | Intermediate | CMA | Unp |
| 17 | Kakweiken | Intermediate | CWH | vm 1 |
| 17 | Kakweiken | Intermediate | CWH | vm 2 |
| 17 | Kakweiken | Intermediate | MH | mm 1 |
| 18 | Kashutl | Low | CWH | vm 1 |
| 18 | Kashutl | Low | CWH | vm 2 |
| 18 | Kashutl | Low | MH | mm 1 |
| 19 | Keogh | Low | CWH | vm 1 |
| 20 | Klaskish | High | CWH | vh 1 |
| 20 | Klaskish | High | CWH | vm 1 |
| 20 | Klaskish | High | CWH | vm 2 |
| 20 | Klaskish | High | MH | mm 1 |
| 21 | Klinaklini Glacier | Intermediate | CMA | Unp |
| 21 | Klinaklini Glacier | Intermediate | CWH | ws 2 |
| 21 | Klinaklini Glacier | Intermediate | MH | mm 2 |
| 22 | Knight East | Low | CMA | Unp |
| 22 | Knight East | Low | CWH | Dm |
| 22 | Knight East | Low | CWH | vm 1 |
| 22 | Knight East | Low | CWH | vm 2 |
| 22 | Knight East | Low | MH | mm 1 |
| 23 | Lower Kingcome | Intermediate | CMA | Unp |
| 23 | Lower Kingcome | Intermediate | CWH | vm 1 |
| 23 | Lower Kingcome | Intermediate | CWH | vm 2 |
| 23 | Lower Kingcome | Intermediate | MH | mm 1 |
| 24 | Lower Klinaklini | Intermediate | CMA | Unp |
| 24 | Lower Klinaklini | Intermediate | CWH | vm 1 |
| 24 | Lower Klinaklini | Intermediate | CWH | vm 2 |
| 24 | Lower Klinaklini | Intermediate | CWH | ws 2 |
| 24 | Lower Klinaklini | Intermediate | MH | mm 1 |
| 24 | Lower Klinaklini | Intermediate | MH | mm 2 |
| 25 | Lower Nimpkish | Low | CMA | Unp |

| Landscape Unit | | BEO | BEC | |
|---|---|---|---|---|
| **Number** | **Name** | | | |
| 25 | Lower Nimpkish | Low | CWH | vm 1 |
| 25 | Lower Nimpkish | Low | CWH | vm 2 |
| 25 | Lower Nimpkish | Low | CWH | xm 2 |
| 25 | Lower Nimpkish | Low | MH | mm 1 |
| 26 | Lull-Sallie | Intermediate | CMA | Unp |
| 26 | Lull-Sallie | Intermediate | CWH | vm 1 |
| 26 | Lull-Sallie | Intermediate | CWH | vm 2 |
| 26 | Lull-Sallie | Intermediate | MH | mm 1 |
| 27 | Mahatta | Low | CWH | vh 1 |
| 27 | Mahatta | Low | CWH | vm 1 |
| 27 | Mahatta | Low | CWH | vm 2 |
| 27 | Mahatta | Low | MH | mm 1 |
| 29 | Marble | Intermediate | CWH | vm 1 |
| 29 | Marble | Intermediate | CWH | vm 2 |
| 29 | Marble | Intermediate | MH | mm 1 |
| 30 | Middle Klinaklini | Intermediate | CMA | Unp |
| 30 | Middle Klinaklini | Intermediate | CWH | ds 2 |
| 30 | Middle Klinaklini | Intermediate | CWH | ws 2 |
| 30 | Middle Klinaklini | Intermediate | ESS | Fmw |
| 30 | Middle Klinaklini | Intermediate | IDF | Ww |
| 30 | Middle Klinaklini | Intermediate | MH | mm 2 |
| 31 | Miriam | Intermediate | CMA | Unp |
| 31 | Miriam | Intermediate | CWH | vm 1 |
| 31 | Miriam | Intermediate | CWH | vm 2 |
| 31 | Miriam | Intermediate | MH | mm 1 |
| 34 | Nasparti | Low | CWH | vh 1 |
| 34 | Nasparti | Low | CWH | vm 2 |
| 35 | Neechanz | High | CWH | vm 3 |
| 35 | Neechanz | High | MH | mm 1 |
| 36 | Neroutsos | Low | CWH | vm 1 |
| 36 | Neroutsos | Low | CWH | vm 2 |
| 37 | Nigei | Low | CWH | vh 1 |
| 39 | Seymour | Intermediate | CMA | Unp |
| 39 | Seymour | Intermediate | CWH | vm 1 |
| 39 | Seymour | Intermediate | CWH | vm 2 |
| 39 | Seymour | Intermediate | CWH | vm 3 |
| 39 | Seymour | Intermediate | MH | mm 1 |
| 41 | Sim | Intermediate | CMA | Unp |
| 41 | Sim | Intermediate | CWH | vm 1 |
| 41 | Sim | Intermediate | CWH | vm 2 |

| Landscape Unit | | BEO | BEC | |
|---|---|---|---|---|
| **Number** | **Name** | | | |
| 41 | Sim | Intermediate | MH | mm 1 |
| 42 | Smith Sound | Low | CWH | vh 1 |
| 43 | Smokehouse | Low | CWH | vh 1 |
| 43 | Smokehouse | Low | CWH | vm 1 |
| 43 | Smokehouse | Low | CWH | vm 2 |
| 43 | Smokehouse | Low | MH | mm 1 |
| 44 | Snowdrift | Intermediate | CMA | Unp |
| 44 | Snowdrift | Intermediate | CWH | vm 1 |
| 44 | Snowdrift | Intermediate | CWH | vm 2 |
| 44 | Snowdrift | Intermediate | MH | mm 1 |
| 45 | Stafford | High | CMA | Unp |
| 45 | Stafford | High | MH | mm 1 |
| 47 | Tahsish | Intermediate | CWH | vm 1 |
| 47 | Tahsish | Intermediate | CWH | vm 2 |
| 47 | Tahsish | Intermediate | MH | mm 1 |
| 50 | Upper Kingcome | Intermediate | CMA | Unp |
| 50 | Upper Kingcome | Intermediate | CWH | vm 1 |
| 50 | Upper Kingcome | Intermediate | CWH | vm 2 |
| 50 | Upper Kingcome | Intermediate | MH | mm 1 |
| 51 | Upper Klinaklini | Intermediate | BAF | Aunp |
| 51 | Upper Klinaklini | Intermediate | CMA | Unp |
| 51 | Upper Klinaklini | Intermediate | CWH | ds 2 |
| 51 | Upper Klinaklini | Intermediate | CWH | ws 2 |
| 51 | Upper Klinaklini | Intermediate | ESS | Fmw |
| 51 | Upper Klinaklini | Intermediate | IDF | Ww |
| 51 | Upper Klinaklini | Intermediate | IMA | Unp |
| 51 | Upper Klinaklini | Intermediate | MH | mm 2 |
| 52 | Upper Nimpkish | Intermediate | CMA | Unp |
| 52 | Upper Nimpkish | Intermediate | CWH | vm 1 |
| 52 | Upper Nimpkish | Intermediate | CWH | vm 2 |
| 52 | Upper Nimpkish | Intermediate | MH | mm 1 |
| 53 | Wakeman | Intermediate | CMA | Unp |
| 53 | Wakeman | Intermediate | CWH | vm 1 |
| 53 | Wakeman | Intermediate | CWH | vm 2 |
| 53 | Wakeman | Intermediate | MH | Mm 1 |
| 54 | Walker | N/A | CWH | vh 1 |

**Table 55 – Landscape unit old seral forest cover requirements**

| BEC | NDT | BEO | Retention Age | Retention % |
|---|---|---|---|---|
| CWH dm | 2 | High | 250 | 13 |
| CWH dm | 2 | Low | 250 | 9 |
| CWH ds 2 | 2 | Intermediate | 250 | 9 |
| CWH vh 1 | 1 | High | 250 | 19 |
| CWH vh 1 | 1 | Intermediate | 250 | 19 |
| CWH vh 1 | 1 | Low | 250 | 13 |
| CWH vm 1 | 1 | High | 250 | 19 |
| CWH vm 1 | 1 | Intermediate | 250 | 19 |
| CWH vm 1 | 1 | Low | 250 | 13 |
| CWH vm 2 | 1 | High | 250 | 19 |
| CWH vm 2 | 1 | Intermediate | 250 | 19 |
| CWH vm 2 | 1 | Low | 250 | 13 |
| CWH vm 3 | 1 | High | 250 | 19 |
| CWH vm 3 | 1 | Intermediate | 250 | 19 |
| CWH ws 2 | 2 | Intermediate | 250 | 9 |
| ESSFmw | 2 | Intermediate | 250 | 9 |
| IDF ww | 4 | Intermediate | 250 | 13 |
| MH mm 1 | 1 | High | 250 | 28 |
| MH mm 1 | 1 | Intermediate | 250 | 19 |
| MH mm 1 | 1 | Low | 250 | 19 |
| MH mm 2 | 1 | Intermediate | 250 | 19 |

### *9.2.3 Stand Level Biodiversity*

After other land classification are complete additional area reductions to the timber harvesting land base, and/or volume reductions to yield curves may be required to provide sufficient reserves of productive timber for wildlife at the site-specific level. These small reserves are referred to as wildlife tree patches. The stand level biodiversity requirement will account for both wildlife trees and tree patches by reducing the average volume per hectare that is harvested, to account for trees which must be left standing within cut-blocks. In the pre-EBM scenario, no additional reductions will be applied for variable retention harvesting.

### *9.2.4 Community Watersheds*

Community watersheds will have a five percent per five year rate-of-cut constraint applied to them, consistent with the Forest Planning and Practices Regulation.

## 9.3 EBM Objectives

### *9.3.1 EBM Objective 8 – Important Fisheries Watersheds*

As stated in Section 6.2.1, a 20% ECA target, based on a hydrological greenup height of nine metres is to be applied to sensitive fisheries zones. Following recommendations provided by the

MoFR Forest Analysis and Inventory Branch, this will be modelled by establishing a maximum disturbance constraint equal to 16% of the productive forest less than six metres in height.

### 9.3.2 EBM Objective 12 – Upland Streams

For the watersheds summarized in Section 6.2.2, a 30% maximum disturbance constraint will be applied. This will ensure that 70% or more of the forest will be maintained as functional riparian forest.

### 9.3.3 EBM Objective 14 – Landscape Level Biodiversity

In the EBM zone, the aspatial targets specified in Section 9.2.2 will be replaced in the EBM zone with the biodiversity objectives set out in the Order. The old seral forest cover retention targets defined in Table 56 will be applied to the site series surrogates as defined in Section 6.2.3. In this case, minimum old seral is defined as age 180.

**Table 56 – SSS old seral forest cover requirements - EBM**

| Very Rare (70% of RONV) | | Rare (70% of RONV) | | Modal (70% of RONV) | | Common (30% of RONV) | | Very Common (30% of RONV) | |
|---|---|---|---|---|---|---|---|---|---|
| SS Surrogate | Old Forest Target | SS Surrogate | Old Forest Target | SS Surrogate | Old Forest Target | SS Surrogate | Old Forest Target | SS Surrogate | Old Forest Target |
| CWHds2-AU10 | 60% | CWHds2-AU6 | 60% | CWHds2-AU1 | 42% | CWHdm-AU1 | 23% | CWHdm-AU7 | 23% |
| CWHds2-AU11 | 60% | CWHmm1-AU5 | 53% | CWHds2-AU7 | 60% | CWHdm-AU2 | 17% | CWHds2-AU12 | 12% |
| CWHmm1-AU4 | 53% | CWHvh1-AU2 | 63% | CWHmm1-AU3 | 41% | CWHdm-AU8 | 23% | CWHds2-AU2 | 18% |
| CWHmm1-AU12 | 29% | CWHvm2-AU1 | 49% | CWHmm1-AU6 | 61% | CWHds2-AU5 | 22% | CWHds2-AU3 | 22% |
| CWHvm2-AU10 | 59% | CWHvm2-AU2 | 49% | CWHmm1-AU9 | 23% | CWHds2-AU9 | 26% | CWHds2-AU8 | 26% |
| CWHxm-AU1 | 53% | CWHvm2-AU3 | 49% | CWHms2-AU10 | 61% | CWHmm1-AU7 | 23% | CWHms2-AU2 | 17% |
| CWHxm-AU3 | 41% | CWHxm-AU2 | 41% | CWHms2-AU11 | 61% | CWHmm1-AU8 | 23% | CWHms2-AU3 | 17% |
| CWHxm-AU4 | 53% | CWHxm-AU7 | 53% | CWHms2-AU4 | 53% | CWHms2-AU1 | 23% | CWHms2-AU5 | 23% |
| CWHxm-AU5 | 53% | CWHxm-AU8 | 53% | CWHvh1-AU11 | 25% | CWHms2-AU6 | 26% | CWHms2-AU7 | 23% |
| CWHxm2-AU10 | 61% | CWHxm2-AU5 | 53% | CWHvh1-AU9 | 29% | CWHms2-AU12 | 12% | CWHms2-AU8 | 23% |
| ESSFmwh-AU12 | 29% | CWHxm2-AU9 | 53% | CWHvh2-AU11 | 59% | CWHvh1-AU12 | 12% | CWHms2-AU9 | 23% |
| ESSFmwh-AU8 | 60% | ESSFmw-AU3 | 50% | CWHvh2-AU4 | 63% | CWHvh1-AU4 | 27% | CWHvh1-AU5 | 29% |
| ESSFmwh-AU9 | 60% | IDFww-AU11 | 60% | CWHvm2-AU11 | 59% | CWHvh1-AU7 | 25% | CWHvh1-AU6 | 29% |
| IDFww-AU6 | 60% | IDFww-AU5 | 50% | CWHvm2-AU12 | 29% | CWHvh1-AU8 | 29% | CWHvh2-AU5 | 29% |
| IDFww-AU7 | 60% | IDFww-AU9 | 60% | CWHvm2-AU4 | 59% | CWHvh2-AU10 | 25% | CWHvh2-AU6 | 29% |

| Very Rare (70% of RONV) | | Rare (70% of RONV) | | Modal (70% of RONV) | | Common (30% of RONV) | | Very Common (30% of RONV) | |
|---|---|---|---|---|---|---|---|---|---|
| **SS Surrogate** | **Old Forest Target** | **SS Surrogate** | **Old Forest Target** | **SS Surrogate** | **Old Forest Target** | **SS Surrogate** | **Old Forest Target** | **SS Surrogate** | **Old Forest Target** |
| MHmm1-AU11 | 59% | MHmm1-AU3 | 49% | CWHws2-AU11 | 60% | CWHvh2-AU12 | 12% | CWHvh2-AU7 | 25% |
| MHmm1-AU12 | 29% | MHmm2-AU3 | 49% | CWHws2-AU5 | 50% | CWHvm1-AU1 | 21% | CWHvh2-AU8 | 29% |
| MHmm1-AU2 | 49% | MHmm2-AU6 | 65% | CWHws2-AU6 | 60% | CWHvm1-AU12 | 12% | CWHvh2-AU9 | 29% |
| MHmm1-AU4 | 59% | MHmm2-AU7 | 59% | CWHxm2-AU6 | 61% | CWHvm1-AU3 | 21% | CWHvm1-AU10 | 25% |
| MHmm2-AU2 | 29% | MHmm2e-AU9 | 59% | ESSFmw-AU12 | 29% | CWHws2-AU12 | 12% | CWHvm1-AU11 | 25% |
| MHmm2-AU5 | 65% | MHwh1-AU5 | 68% | IDFww-AU2 | 42% | CWHws2-AU2 | 18% | CWHvm1-AU2 | 21% |
| MHmm2e-AU12 | 29% | MHwh1-AU8 | 68% | IDFww-AU8 | 60% | CWHws2-AU3 | 22% | CWHvm1-AU4 | 25% |
| MHmm2e-AU3 | 49% | | | MHmm1-AU5 | 65% | CWHws2-AU7 | 26% | CWHvm1-AU5 | 28% |
| MHmmp-AU8 | 59% | | | MHmm1-AU7 | 59% | CWHxm2-AU1 | 23% | CWHvm1-AU6 | 28% |
| MHmmp-AU9 | 59% | | | MHmm2-AU12 | 29% | CWHxm2-AU2 | 17% | CWHvm1-AU7 | 25% |
| | | | | MHwh1-AU9 | 68% | CWHxm2-AU8 | 23% | CWHvm1-AU8 | 25% |
| | | | | | | ESSFmw-AU8 | 26% | CWHvm1-AU9 | 25% |
| | | | | | | ESSFmw-AU9 | 26% | CWHvm2-AU5 | 28% |
| | | | | | | IDFww-AU12 | 12% | CWHvm2-AU6 | 28% |
| | | | | | | IDFww-AU3 | 22% | CWHvm2-AU7 | 25% |
| | | | | | | MHwh1-AU6 | 29% | CWHvm2-AU8 | 25% |
| | | | | | | CWHdm-AU3 | 18 | CWHvm2-AU9 | 25% |
| | | | | | | CWHdm-AU5 | 23 | CWHvm3-AU9 | 25% |
| | | | | | | CWHdm-AU6 | 26 | CWHws2-AU8 | 26% |
| | | | | | | CWHdm-AU12 | 13 | CWHws2-AU9 | 26% |
| | | | | | | CWHdm-AU4 | 23 | CWHxm2-AU7 | 23% |
| | | | | | | CWHdm-AU9 | 23 | MHmm1-AU6 | 28% |
| | | | | | | CWHmm1-AU1 | 23 | MHmm1-AU8 | 25% |
| | | | | | | CWHmm1-AU2 | 18 | MHmm1-AU9 | 25% |

| Very Rare (70% of RONV) | | Rare (70% of RONV) | | Modal (70% of RONV) | | Common (30% of RONV) | | Very Common (30% of RONV) | |
|---|---|---|---|---|---|---|---|---|---|
| **SS Surrogate** | **Old Forest Target** | **SS Surrogate** | **Old Forest Target** | **SS Surrogate** | **Old Forest Target** | **SS Surrogate** | **Old Forest Target** | **SS Surrogate** | **Old Forest Target** |
| | | | | | | CWHxm2-AU12 | 26 | MHmm2-AU8 | 25% |
| | | | | | | CWHxm2-AU4 | 23 | MHmm2-AU9 | 25% |
| | | | | | | CWHxm2-AU3 | 17 | | |

# 10.0 General Modelling Considerations

This section describes the assumptions used to model the harvesting systems employed in the Kingcome TSA.

## 10.1 Minimum Harvest Age

Minimum harvest ages are necessary for timber supply modelling to ensure the model does not, at times of low timber availability, select young stands unlikely to be harvested operationally. In TSR 2 minimum harvest ages were based on achieving minimum volume thresholds and/or 95% of the culmination of mean annual increment (CMAI). Culmination age is defined as the age at which stand volume, less decay, waste and breakage, is maximized to a precision of one decimal place. Minimum volume thresholds for TSR 3 are set at 350 $m^3$/ha for cedar-leading stands, 500 $m^3$/ha for other coniferous-leading stands, and 250 $m^3$/ha for deciduous-leading stands. The minimum volume for deciduous-leading stands was reduced from the TSR 2 threshold of 350 $m^3$/ha, based on input from Northwest Hardwoods. Minimum ages based on 95% of CMAI and the TSR 2 minimum volume thresholds are presented in Table 57. In the analysis, minimum harvest age for each AU will be the greater of the age at CMAI and age at minimum volume.

In the majority of cases, the minimum volume threshold is the limiting factor in determining minimum harvest age. Only in one case (AU 167/367) did the stand not achieve the minimum volume threshold. This AU represents only a minor area (26 hectares), and will be excluded from the analysis.

**Table 57 – Minimum harvest ages**

| Existing stands | | | | | Future stands | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Current AU | Age @ CMAI | Volume @CMAI | Age at Minimum Volume | Leading Species | Future AU | Age @ CMAI | Volume @ CMAI | Age at Minimum Volume | Leading Species |
| 1 | 60 | 320 | 70 | Cw,Yc | 201 | 70 | 307 | 70 | Cw |
| 2 | 70 | 244 | 90 | Cw,Yc | 202 | 60 | 319 | 90 | Cw |
| 3 | 90 | 220 | 130 | Cw,Yc | 203 | 60 | 319 | 130 | Cw |
| 4 | 50 | 454 | 60 | Hwc,Hm,Ba | 204 | 80 | 626 | 60 | Hw |
| 5 | 60 | 409 | 80 | Hwc,Hm,Ba | 205 | 60 | 380 | 80 | Hw |
| 6 | 70 | 270 | 120 | Hwc,Hm,Ba | 206 | 60 | 348 | 120 | Hw |
| 7 | 70 | 398 | 90 | Ss | 207 | 80 | 557 | 90 | Ss |
| 8 | 50 | 285 | 50 | Dr,Mb | 208 | 30 | 145 | 50 | Dr |
| 10 | 60 | 617 | 60 | Fdc | 210 | 60 | 653 | 60 | Fd |
| 11 | 80 | 478 | 70 | Cw,Yc | 211 | 60 | 305 | 70 | Cw |
| 12 | 70 | 230 | 100 | Cw,Yc | 212 | 70 | 333 | 100 | Cw |
| 13 | 90 | 228 | 130 | Cw,Yc | 213 | 70 | 341 | 130 | Cw |
| 14 | 50 | 441 | 60 | Hwc,Hm,Ba | 214 | 80 | 685 | 60 | Hw |
| 15 | 60 | 392 | 80 | Hwc,Hm,Ba | 215 | 60 | 391 | 80 | Hw |
| 16 | 70 | 267 | 120 | Hwc,Hm,Ba | 216 | 70 | 405 | 120 | Hw |
| 17 | 60 | 342 | 90 | Ss | 217 | 80 | 571 | 90 | Ss |

| Existing stands | | | | | Future stands | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Current AU** | **Age @ CMAI** | **Volume @CMAI** | **Age at Minimum Volume** | **Leading Species** | **Future AU** | **Age @ CMAI** | **Volume @ CMAI** | **Age at Minimum Volume** | **Leading Species** |
| 18 | 40 | 236 | 50 | Dr,Mb | 218 | 30 | 160 | 50 | Dr |
| 19 | 50 | 267 | 50 | Act | 219 | 50 | 267 | 50 | Act |
| 20 | 60 | 396 | 80 | Fdc | 220 | 70 | 486 | 80 | Fd |
| 32 | 80 | 293 | 100 | Cw/Yc | 232 | 80 | 194 | 100 | Fd |
| 33 | 140 | 308 | 170 | Cw/Yc | 233 | 110 | 140 | 170 | Fd |
| 34 | 60 | 548 | 60 | Hwc,Hm,Ba | 234 | 70 | 550 | 60 | Fd |
| 35 | 60 | 434 | 70 | Hwc,Hm,Ba | 235 | 80 | 500 | 70 | Fd |
| 36 | 80 | 303 | 130 | Hwc,Hm,Ba | 236 | 80 | 169 | 130 | Fd |
| 38 | 50 | 296 | 50 | Dr | 238 | 80 | 401 | 50 | Fd |
| 42 | 70 | 244 | 90 | Cw/Yc | 242 | 80 | 225 | 90 | Fd |
| 43 | 90 | 218 | 130 | Cw/Yc | 243 | 100 | 157 | 130 | Fd |
| 44 | 50 | 425 | 60 | Hwc,Hm,Ba | 244 | 70 | 659 | 60 | Fd |
| 45 | 60 | 418 | 70 | Hwc,Hm,Ba | 245 | 80 | 482 | 70 | Fd |
| 46 | 70 | 262 | 120 | Hwc,Hm,Ba | 246 | 80 | 192 | 120 | Fd |
| 47 | 60 | 381 | 80 | Ss | 247 | 80 | 438 | 80 | Fd |
| 48 | 40 | 239 | 50 | Dr | 248 | 70 | 473 | 50 | Fd |
| 49 | 50 | 267 | 50 | Act | 249 | 70 | 697 | 50 | Fd |
| 61 | 140 | 289 | 180 | Cw,Yc | 261 | 60 | 332 | 180 | Cw |
| 62 | 90 | 267 | 170 | Hwc,Hm,Ba | 262 | 70 | 402 | 170 | Hw |
| 63 | 140 | 289 | 190 | Cw,Yc | 263 | 70 | 344 | 190 | Cw |
| 64 | 90 | 231 | 190 | Hwc,Hm,Ba | 264 | 80 | 375 | 190 | Hw |
| 67 | 140 | 296 | 180 | Cw,Yc | 267 | 120 | 128 | 180 | Fd |
| 68 | 90 | 267 | 160 | Hwc,Hm,Ba | 268 | 100 | 151 | 160 | Fd |
| 69 | 140 | 280 | 190 | Cw,Yc | 269 | 120 | 128 | 190 | Fd |
| 70 | 90 | 259 | 170 | Hwc,Hm,Ba | 270 | 100 | 155 | 170 | Fd |
| 101 | 60 | 313 | 70 | Cw,Yc | 301 | 60 | 321 | 70 | Cw |
| 102 | 60 | 401 | 60 | Cw,Yc | 302 | 80 | 621 | 60 | Cw |
| 103 | 140 | 338 | 150 | Cw,Yc | 303 | 100 | 224 | 150 | Cw |
| 104 | 80 | 701 | 70 | Hwc,Hm,Ba | 304 | 80 | 701 | 70 | Hw |
| 105 | 80 | 603 | 70 | Hwc,Hm,Ba | 305 | 80 | 604 | 70 | Hw |
| 106 | 60 | 339 | 80 | Hwc,Hm,Ba | 306 | 60 | 341 | 80 | Hw |
| 107 | 70 | 644 | 60 | Ss | 307 | 70 | 644 | 60 | Ss |
| 108 | 30 | 134 | 60 | Dr,Mb | 308 | 30 | 135 | 60 | Dr |
| 111 | 70 | 353 | 70 | Cw,Yc | 311 | 60 | 281 | 70 | Cw |
| 112 | 70 | 325 | 80 | Cw,Yc | 312 | 70 | 331 | 80 | Cw |
| 113 | 60 | 326 | 70 | Cw,Yc | 313 | 60 | 332 | 70 | Cw |
| 114 | 80 | 668 | 70 | Hwc,Hm,Ba | 314 | 80 | 668 | 70 | Hw |
| 115 | 60 | 396 | 80 | Hwc,Hm,Ba | 315 | 80 | 598 | 80 | Hw |
| 116 | 70 | 431 | 80 | Hwc,Hm,Ba | 316 | 60 | 335 | 80 | Hw |
| 117 | 80 | 710 | 70 | Ss | 317 | 80 | 710 | 70 | Sc |

| Existing stands | | | | | Future stands | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Current AU** | **Age @ CMAI** | **Volume @CMAI** | **Age at Minimum Volume** | **Leading Species** | **Future AU** | **Age @ CMAI** | **Volume @ CMAI** | **Age at Minimum Volume** | **Leading Species** |
| 118 | 30 | 137 | 60 | Dr,Mb | 318 | 30 | 138 | 60 | Dr |
| 119 | 50 | 267 | 50 | Act | 319 | 50 | 267 | 50 | Act |
| 120 | 80 | 466 | 90 | Fdc | 320 | 80 | 474 | 90 | Fd |
| 131 | 70 | 752 | 50 | Cw,Yc | 331 | 70 | 572 | 50 | Fd |
| 132 | 90 | 288 | 110 | Cw,Yc | 332 | 90 | 201 | 110 | Fd |
| 135 | 70 | 433 | 80 | Hwc,Hm,Ba | 335 | 60 | 264 | 80 | Fd |
| 141 | 60 | 293 | 70 | Cw/Cy | 341 | 80 | 496 | 70 | Fd |
| 144 | 80 | 663 | 70 | Hwc,Hm,Ba | 344 | 70 | 541 | 70 | Fd |
| 145 | 60 | 371 | 80 | Hwc,Hm,Ba | 345 | 80 | 495 | 80 | Fd |
| 146 | 70 | 595 | 70 | Hwc,Hm,Ba | 346 | 90 | 201 | 70 | Fd |
| 147 | 70 | 732 | 60 | Ss | 347 | 70 | 612 | 60 | Fd |
| 148 | 30 | 167 | 50 | Dr | 348 | 70 | 456 | 50 | Fd |
| 162 | 70 | 350 | 90 | Cw,Yc | 362 | 70 | 351 | 90 | Cw |
| 163 | 80 | 310 | 90 | Hwc,Hm,Ba | 363 | 80 | 315 | 90 | Hw |
| 164 | 80 | 384 | 100 | Cw,Yc | 364 | 80 | 385 | 100 | Cw |
| 167 | 150 | 195 | - | Hwc,Hm,Ba | 367 | 130 | 123 | - | Fd |
| 401 | 60 | 292 | 70 | Cw,Yc | 601 | 60 | 292 | 70 | Cw |
| 402 | 60 | 371 | 60 | Cw,Yc | 602 | 60 | 371 | 60 | Cw |
| 403 | 60 | 325 | 70 | Cw,Yc | 603 | 60 | 325 | 70 | Cw |
| 404 | 80 | 613 | 70 | Hwc,Hm,Ba | 604 | 80 | 613 | 70 | Hw |
| 405 | 80 | 602 | 70 | Hwc,Hm,Ba | 605 | 80 | 602 | 70 | Hw |
| 406 | 60 | 380 | 80 | Hwc,Hm,Ba | 606 | 60 | 380 | 80 | Hw |
| 410 | 70 | 608 | 60 | Fdc | 610 | 70 | 608 | 60 | Fd |
| 411 | 70 | 326 | 80 | Cw,Yc | 611 | 70 | 326 | 80 | Cw |
| 412 | 70 | 335 | 80 | Cw,Yc | 612 | 70 | 335 | 80 | Cw |
| 413 | 70 | 355 | 70 | Cw,Yc | 613 | 70 | 355 | 70 | Cw |
| 414 | 60 | 405 | 70 | Hwc,Hm,Ba | 614 | 60 | 405 | 70 | Hw |
| 415 | 60 | 372 | 80 | Hwc,Hm,Ba | 615 | 60 | 372 | 80 | Hw |
| 416 | 80 | 360 | 110 | Hwc,Hm,Ba | 616 | 80 | 360 | 110 | Hw |
| 419 | 50 | 268 | 50 | Act | 619 | 50 | 268 | 50 | Act |
| 420 | 80 | 443 | 90 | Fdc | 620 | 80 | 443 | 90 | Fd |
| 461 | 90 | 227 | 130 | Cw,Yc | 661 | 90 | 227 | 130 | Cw |
| 462 | 140 | 367 | 200 | Hwc,Hm,Ba | 662 | 110 | 271 | 200 | Hw |
| 463 | 140 | 288 | 180 | Cw,Yc | 663 | 110 | 214 | 180 | Cw |
| 464 | 90 | 337 | 130 | Hwc,Hm,Ba | 664 | 90 | 337 | 130 | Hw |

It should be recognized that the application of cover constraints in particular zones may delay stand entry well beyond these minimum ages. Areas are often harvested well beyond their "merchantability" ages, depending on the availability of "merchantable" timber and cover class constraints.

A sensitivity analysis investigating the impact of increasing or decreasing the minimum harvest age by ten years will also be performed.

## 10.2 Harvest Systems

In the Pre-EBM analysis, clearcutting with wildlife tree patch retention is applied in all cases. In the EBM analysis, variable retention harvesting is applied in specific areas within the EBM zone, as described in Section 8.5, with wildlife tree patch retention applied only in the non-EBM zone.

## 10.3 Harvest Flow Objectives

A number of different harvest flows will be explored, based on tradeoffs between short and mid-term harvest levels. The forest cover constraints and biological capacity of the THLB will dictate timber availability and harvest level options.

The overall strategy employed in the TSA is to gradually adjust harvest levels towards the best estimate of the long-term harvest level (LTHL) for the forest. In all timber supply scenarios, the choice(s) of harvest flow will reflect the following objectives:

- Achieve an acceptable short-term harvest level;
- Decrease the periodic harvest level in acceptable steps (≤ 10%) when declines are required to meet all objectives associated with the various resources on the land base;
- Do not permit the mid-term harvest level to fall below a level reflecting the productive capacity of the TSA (based on VDYP yield estimates); and
- Achieve a stable long-term harvest level over a 250-year time horizon reflecting the productive capacity of the TSA (based on TIPSY yield estimates).

## 10.4 Non-recoverable Losses

In the analysis, an allowance must be made for non-recoverable losses (volume losses due to fire, windthrow and insect damage that are not captures in stand yield forecasts). In TSR 2 these losses were estimated at 3,083 $m^3$ per year from fire and 10,500 $m^3$/year from windthrow, for a total of 13,583 $m^3$/year. The 2008-2010 Coast Timber Supply Areas Regional Forest Health Overview indicates that this estimate is now too conservative with the increased use of partial cutting and retention system harvesting. However, at this time a revised estimate is not available, and therefore the TSR 2 estimate will be used.

## 10.5 Initial Harvest Level

The current AAC for the Kingcome TSA is 1,232,000 m3/yr. In addition, an allowance must be made for non-recoverable losses (NRLs). As the timber supply analysis is based on the net harvest plus NRLs, the initial gross harvest level for the TSR 3 Pre-EBM option will be set to 1,245,600 m3/yr, as summarized in Table 58.

**Table 58 – Initial harvest level**

| Management Unit | Volumes ($m^3$/yr) | | |
|---|---|---|---|
| | Net Harvest | NRLs | Gross Harvest |
| Kingcome TSA | 1,232,000 | 13,600 | 1,245,600 |

This "initial harvest rate" provides a starting point for the analysis. However, the timber harvesting land base and cover constraints have changed since the TSR 2 analysis. Therefore, the initial harvest levels may subsequently be adjusted to achieve harvest flow objectives over the entire planning period.

## 10.6 Long Run Sustained Yield

Long run sustained yield (LRSY) values calculated on the basis of both natural and managed stand yield curves are shown in Table 59. These estimates provide a benchmark for establishing mid-term and long-term harvest flow targets in the timber supply analysis. However, due to the imposition of forest cover constraints, minimum harvest levels, and harvest scheduling constraints, the realized timber flow will always fall below these levels.

**Table 59 – LRSY values for natural and managed stands – Pre-EBM analysis**

| Description | Natural | Managed |
|---|---|---|
| THLB, including NSR (ha) | 208,175 | 208,175 |
| - Future roads (ha) | 3,071 | 3,071 |
| = Long term THLB (ha) | 205,104 | 205,104 |
| * Average MAI at culmination ($m^3$/ha) | 4.3 | 5.5 |
| **= Theoretical Gross LRSY ($m^3$/yr)** | **881,947** | **1,128,072** |
| - Wildlife tree patch retention ($m^3$/yr) | -52,917 | -67,684 |
| - Non-recoverable losses ($m^3$/yr) | -13,600 | -13,600 |
| **= Theoretical Net LRSY ($m^3$/yr)** | **815,430** | **1,046,788** |

## 10.7 Harvest Rules

A relative oldest first harvest rule will be used. Under this rule stands that have the largest difference between their minimum harvest age and their current age are prioritized first. However, as a result of previous discussions with government, licensees are permitted to, and are harvesting second growth. This reflects current practice, and fits with the Coast Revitalization Strategy announced by the Minister in 2007. Consequently, second growth harvest contribution will be monitored in the base case by analysis unit. Short-term harvest of second growth may be limited if the contribution from this inventory component is deemed to be excessive and compromises timber supply. Any constraints imposed on second growth harvest will be described in the Timber Supply Analysis report. This approach will allow an acceptable maximum second growth harvest rate to be identified that does not adversely affect the long-term harvest level.

Allowing second growth harvest to otherwise be constrained by market demand in the five year term of this TSR will ensure that the Government's revitalization objective is appropriately addressed in this analysis.

## 10.8 Natural Disturbance Modelling

In timber supply analysis, the productive non-contributing land base is available to fulfill various resource management requirements, (*i.e.* seral requirements, retention requirements and thermal requirements). The productive non-contributing land base is not available for harvest. Therefore, unless modelled otherwise, it will continuously age throughout the planning horizon. This is of concern as it becomes unrealistically old and over-contributes to the fulfillment of certain forest cover requirements, thereby reducing the impact on the timber harvest land base (MoFR, 2003b). In reality there will be some level of natural disturbance within the non-contributing land base component, although the frequency, location, and size of these disturbances cannot be reliably predicted.

The following modelling methodology will be employed in these analyses in order to capture the impact of natural disturbances patterns on the productive land base, and in particular on seral and old growth retention requirements:

The methodology follows that outlined in "*Modelling Options for Disturbance of Areas Outside of the Timber Harvesting Land base, Draft Working Paper, March 2004*".

For each BEC variant containing pre-EBM THLB, the following parameters were determined based on the Biodiversity Guidebook.

A. Disturbance event return interval (based on NDT).

B. Old growth minimum age.

C. The estimated percentage of area older than the applicable old seral stage. (Biodiversity Guidebook, Table A.4.2)

D. Effective rotation age (B / (1-C/100))

E. Minimum target area (contributing non-THLB area / D)

F. Application of disturbance targets at the LU/BEC level to simulate disturbance rates in the contributing non-THLB.

This process will achieve the natural range of variation for each biogeoclimatic zone within the forest estate, but by design there will be some variations within individual landscape units. The model will recruit the oldest stands in order to achieve the seral requirements as soon as possible. This will impose the desired disturbance each year and achieve a seral stage distribution compatible with the natural range of variation.

Table 60 provides a summary of disturbance targets, to be applied in the analysis at the LU/BEC level.

**Table 60 – Natural disturbance parameters for the non-THLB**

| BEC | Productive Area (ha) | THLB Area (ha) | Non-contributing Area (ha) | Disturbance Interval | % Older Than Age 250 | Effective Rotation | Target Disturbance (ha/year) |
|---|---|---|---|---|---|---|---|
| CMA unp | 4,974 | 67 | 4,907 | 250 | 37 | 397 | 12 |
| CWH dm | 702 | 185 | 517 | 250 | 37 | 397 | 1 |
| CWH vh 1 | 202,870 | 57,748 | 145,122 | 250 | 37 | 397 | 366 |
| CWH vm 1 | 258,743 | 128,872 | 129,871 | 250 | 37 | 397 | 327 |
| CWH vm 2 | 111,232 | 19,795 | 91,437 | 250 | 37 | 397 | 230 |
| MH mm 1 | 41,570 | 1,509 | 40,062 | 350 | 49 | 490 | 82 |
| **Total** | **620,092** | **208,175** | **411,917** | | | | **1,019** |

## 10.9 Harvest Reporting

In reporting on the timber flow, the following components will be tracked:

- The contribution of "marginal" cedar/cypress and hemlock/balsam stands, in order that these components can be compared to past performance;
- The contribution of deciduous stand types (alder and cottonwood) independent of conifer types;
- The harvest levels within and outside of the EBM zone.

## 10.10 EBM

### *10.10.1 Objective 6 – Monumental cedar*

1. *"Maintain a sufficient volume and quality of monumental cedar to support the applicable First Nation's present and future cultural use of monumental cedar, following information-sharing or consultation with the applicable First Nation, and to the extent practical".*

### *10.10.2 Objective 7 – Stand level retention of cedar*

1. *"Maintain a sufficient volume and quality of Western red cedar and Yellow cedar to support the applicable First Nation's cultural use of Western red cedar and Yellow cedar, to the extent possible.*
2. *Within a cutblock where a partial cut silviculture system is used, design dispersed stand retention so that the first 15% of the total retained basal area maintains mature and old Western red cedar and Yellow cedar representative of the preharvest stand".*

In the EBM scenario, the harvest of cedar/cypress will be monitored and reported on to ensure that EBM objectives 6 and 7 will be met. Forest legislation allows for each First Nation to annually access up to 250 $m^3$ of timber free of stumpage for cultural and traditional uses on-Reserve. Based on there being 10 First Nations in the Kingcome TSA, an annual allowance of 2,500 $m^3$/year is estimated to address EBM objectives 6 and 7. (Ted Stevens, personal communications).

## 11.0 SENSITIVITY ANALYSES

Sensitivity analysis will be used to provide a measure of the upper and lower bounds of the Pre-EBM harvest forecast that reflects the uncertainty in the data and/or the management assumptions made. A specific variable is adjusted and the magnitude of the increase and decrease in the sensitivity variable reflects the degree of uncertainty surrounding the assumption associated with that given variable. By developing and testing a number of sensitivity analyses, it is possible to determine which variables most affect results. Table 61 summarizes the sensitivity issues currently identified.

**Table 61 – Sensitivity analysis issues**

| Issue | Tested Sensitivity Level |
|---|---|
| Harvest flow | Establish highest initial harvest level<br>Establish non-declining even flow (NDEF) harvest level<br>Regulate the flow from the EBM and non-EBM zones |
| Harvest rule | Use absolute oldest first<br>Alternate deciduous harvest profiles |
| Land base | Adjust timber harvesting land base by +/- 10%<br>Alter economic thresholds in operability assessment<br>Exclude marginal cedar/cypress and hemlock/balsam types |
| Growth and yield | Adjust existing yields by +/- 10%<br>Adjust managed yield site index values by +/- 2 metres.<br>Apply inventory SI values instead of SIA values to managed stands<br>Apply 8% OAF1 adjustments to TIPSY yield curves |
| Visual landscape | Adjust green-up ages +/- 5 years |
| Green-up | Adjust all green-up ages +/- 5 years |
| Minimum harvest ages | Adjust minimum harvest ages +/- 10 years |
| Second growth | Evaluation of alternative second growth harvest rates on short and long-term harvest levels |
| Variable retention | Apply alternative (high and low) EBM variable retention rules |

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# APPENDIX I
# PRE-EBM YIELD TABLES

| Au | Model | age_0 | age_10 | age_20 | age_30 | age_40 | age_50 | age_60 | age_70 | age_80 | age_90 | age_100 | age_110 | age_120 | age_130 | age_140 | age_150 | age_160 | age_170 | age_180 | age_190 | age_200 | age_210 | age_220 | age_230 | age_240 | age_250 | age_260 | age_270 | age_280 | age_290 | age_300 | age_310 | age_320 | age_330 | age_340 | age_350 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | VDYP6 | 0 | 0 | 1 | 41 | 138 | 231 | 320 | 401 | 478 | 548 | 613 | 675 | 725 | 775 | 820 | 859 | 893 | 921 | 951 | 981 | 1,009 | 1,037 | 1,071 | 1,103 | 1,134 | 1,165 | 1,167 | 1,169 | 1,171 | 1,173 | 1,174 | 1,175 | 1,176 | 1,177 | 1,178 | 1,178 |
| 2 | VDYP6 | 0 | 0 | 0 | 1 | 42 | 114 | 182 | 244 | 301 | 354 | 403 | 449 | 487 | 524 | 557 | 587 | 612 | 633 | 655 | 677 | 698 | 718 | 741 | 765 | 787 | 809 | 813 | 817 | 820 | 823 | 826 | 829 | 831 | 834 | 836 | 838 |
| 3 | VDYP6 | 0 | 0 | 0 | 0 | 3 | 35 | 85 | 133 | 178 | 220 | 259 | 296 | 326 | 356 | 382 | 404 | 424 | 439 | 457 | 473 | 489 | 504 | 522 | 539 | 556 | 573 | 576 | 579 | 582 | 584 | 587 | 589 | 591 | 593 | 595 | 596 |
| 4 | VDYP6 | 0 | 0 | 7 | 163 | 320 | 454 | 568 | 666 | 751 | 824 | 888 | 944 | 993 | 1,040 | 1,082 | 1,120 | 1,154 | 1,184 | 1,211 | 1,237 | 1,260 | 1,281 | 1,300 | 1,318 | 1,334 | 1,349 | 1,360 | 1,369 | 1,378 | 1,386 | 1,393 | 1,399 | 1,404 | 1,409 | 1,413 | 1,417 |
| 5 | VDYP6 | 0 | 0 | 1 | 64 | 196 | 310 | 409 | 496 | 572 | 638 | 697 | 750 | 795 | 839 | 880 | 916 | 948 | 977 | 1,005 | 1,030 | 1,054 | 1,075 | 1,095 | 1,114 | 1,131 | 1,147 | 1,158 | 1,167 | 1,176 | 1,183 | 1,190 | 1,197 | 1,202 | 1,207 | 1,212 | 1,216 |
| 6 | VDYP6 | 0 | 0 | 0 | 3 | 43 | 127 | 203 | 270 | 331 | 385 | 434 | 478 | 517 | 554 | 588 | 619 | 648 | 673 | 697 | 720 | 742 | 762 | 781 | 798 | 815 | 830 | 840 | 850 | 858 | 866 | 873 | 880 | 886 | 892 | 898 | 902 |
| 7 | VDYP6 | 0 | 0 | 16 | 76 | 156 | 240 | 324 | 398 | 464 | 522 | 574 | 621 | 662 | 702 | 739 | 772 | 803 | 830 | 856 | 881 | 903 | 925 | 945 | 963 | 981 | 998 | 1,012 | 1,025 | 1,038 | 1,050 | 1,061 | 1,072 | 1,082 | 1,092 | 1,102 | 1,111 |
| 8 | VDYP6 | 0 | 1 | 41 | 130 | 216 | 285 | 340 | 368 | 393 | 414 | 434 | 452 | 467 | 482 | 495 | 507 | 518 | 527 | 536 | 545 | 553 | 560 | 568 | 575 | 581 | 587 | 591 | 595 | 598 | 601 | 604 | 607 | 609 | 611 | 614 | 616 |
| 10 | VDYP6 | 0 | 0 | 1 | 148 | 331 | 486 | 617 | 731 | 831 | 920 | 999 | 1,069 | 1,132 | 1,181 | 1,222 | 1,255 | 1,279 | 1,295 | 1,304 | 1,322 | 1,339 | 1,356 | 1,372 | 1,388 | 1,403 | 1,417 | 1,418 | 1,419 | 1,420 | 1,420 | 1,420 | 1,421 | 1,421 | 1,420 | 1,420 | 1,420 |
| 11 | VDYP6 | 0 | 0 | 0 | 38 | 138 | 234 | 323 | 403 | 478 | 546 | 610 | 669 | 717 | 765 | 809 | 847 | 880 | 908 | 938 | 966 | 994 | 1,020 | 1,052 | 1,083 | 1,112 | 1,141 | 1,145 | 1,149 | 1,152 | 1,155 | 1,157 | 1,159 | 1,161 | 1,163 | 1,165 | 1,166 |
| 12 | VDYP6 | 0 | 0 | 0 | 0 | 37 | 106 | 171 | 230 | 285 | 337 | 384 | 429 | 466 | 502 | 534 | 562 | 586 | 606 | 628 | 649 | 669 | 688 | 711 | 734 | 756 | 778 | 781 | 783 | 786 | 788 | 791 | 793 | 795 | 796 | 798 | 799 |
| 13 | VDYP6 | 0 | 0 | 0 | 0 | 4 | 42 | 93 | 141 | 186 | 228 | 268 | 305 | 336 | 365 | 392 | 414 | 434 | 449 | 467 | 484 | 500 | 516 | 534 | 552 | 570 | 587 | 589 | 591 | 593 | 595 | 597 | 598 | 600 | 601 | 603 | 604 |
| 14 | VDYP6 | 0 | 0 | 6 | 157 | 310 | 441 | 553 | 648 | 730 | 802 | 864 | 919 | 966 | 1,012 | 1,053 | 1,090 | 1,122 | 1,151 | 1,178 | 1,203 | 1,225 | 1,246 | 1,265 | 1,282 | 1,298 | 1,313 | 1,322 | 1,330 | 1,338 | 1,344 | 1,350 | 1,355 | 1,360 | 1,363 | 1,366 | 1,369 |
| 15 | VDYP6 | 0 | 0 | 0 | 60 | 186 | 295 | 392 | 474 | 547 | 611 | 668 | 719 | 763 | 806 | 845 | 879 | 910 | 938 | 964 | 988 | 1,011 | 1,032 | 1,051 | 1,069 | 1,086 | 1,102 | 1,111 | 1,119 | 1,127 | 1,133 | 1,140 | 1,145 | 1,150 | 1,154 | 1,158 | 1,162 |
| 16 | VDYP6 | 0 | 0 | 0 | 2 | 48 | 127 | 201 | 267 | 325 | 378 | 426 | 470 | 508 | 544 | 577 | 608 | 635 | 659 | 682 | 704 | 725 | 745 | 763 | 781 | 797 | 813 | 821 | 828 | 835 | 842 | 848 | 853 | 858 | 862 | 866 | 870 |
| 17 | VDYP6 | 0 | 0 | 23 | 80 | 168 | 259 | 342 | 413 | 476 | 531 | 580 | 623 | 661 | 698 | 732 | 762 | 789 | 814 | 837 | 859 | 879 | 898 | 915 | 932 | 947 | 962 | 974 | 985 | 996 | 1,007 | 1,017 | 1,026 | 1,035 | 1,043 | 1,052 | 1,059 |
| 18 | VDYP6 | 0 | 5 | 60 | 154 | 236 | 301 | 352 | 376 | 398 | 417 | 434 | 450 | 464 | 477 | 489 | 500 | 509 | 518 | 526 | 534 | 541 | 548 | 555 | 562 | 568 | 574 | 577 | 579 | 582 | 584 | 586 | 587 | 589 | 591 | 592 | 593 |
| 19 | VDYP7 | 0 | 0 | 41 | 117 | 195 | 267 | 331 | 387 | 435 | 476 | 509 | 534 | 552 | 561 | 563 | 558 | 548 | 536 | 522 | 508 | 493 | 477 | 461 | 445 | 430 | 415 | 400 | 386 | 372 | 358 | 345 | 335 | 327 | 319 | 311 | 304 |
| 20 | VDYP6 | 0 | 0 | 1 | 49 | 183 | 299 | 396 | 478 | 549 | 612 | 667 | 717 | 761 | 796 | 825 | 849 | 866 | 878 | 885 | 896 | 908 | 919 | 930 | 940 | 950 | 959 | 961 | 963 | 965 | 967 | 968 | 969 | 971 | 972 | 973 | 973 |
| 32 | VDYP6 | 0 | 0 | 0 | 0 | 24 | 100 | 171 | 234 | 293 | 347 | 397 | 444 | 482 | 520 | 553 | 583 | 608 | 629 | 652 | 674 | 694 | 714 | 737 | 759 | 781 | 802 | 808 | 813 | 818 | 822 | 826 | 830 | 834 | 837 | 840 | 843 |
| 33 | VDYP6 | 0 | 0 | 0 | 0 | 1 | 16 | 50 | 93 | 132 | 169 | 202 | 234 | 261 | 285 | 308 | 327 | 343 | 357 | 371 | 385 | 398 | 410 | 424 | 439 | 452 | 465 | 469 | 472 | 474 | 477 | 479 | 481 | 483 | 485 | 487 | 488 |
| 34 | VDYP6 | 0 | 0 | 2 | 145 | 301 | 434 | 548 | 645 | 729 | 802 | 865 | 920 | 967 | 1,013 | 1,055 | 1,092 | 1,125 | 1,155 | 1,182 | 1,207 | 1,229 | 1,249 | 1,267 | 1,284 | 1,299 | 1,312 | 1,323 | 1,333 | 1,341 | 1,349 | 1,355 | 1,361 | 1,366 | 1,371 | 1,374 | 1,377 |
| 35 | VDYP6 | 0 | 0 | 1 | 78 | 213 | 331 | 434 | 523 | 601 | 670 | 730 | 784 | 831 | 876 | 917 | 954 | 987 | 1,017 | 1,044 | 1,070 | 1,094 | 1,116 | 1,136 | 1,155 | 1,172 | 1,188 | 1,198 | 1,207 | 1,216 | 1,223 | 1,229 | 1,235 | 1,240 | 1,245 | 1,249 | 1,252 |
| 36 | VDYP6 | 0 | 0 | 0 | 0 | 27 | 106 | 178 | 243 | 303 | 357 | 407 | 452 | 492 | 530 | 565 | 596 | 625 | 650 | 675 | 699 | 722 | 744 | 764 | 784 | 802 | 820 | 828 | 836 | 842 | 849 | 855 | 860 | 865 | 870 | 874 | 878 |
| 38 | VDYP6 | 0 | 0 | 38 | 119 | 210 | 296 | 368 | 403 | 433 | 460 | 484 | 505 | 523 | 541 | 558 | 573 | 586 | 599 | 611 | 622 | 632 | 641 | 650 | 658 | 666 | 673 | 680 | 686 | 692 | 698 | 703 | 708 | 713 | 718 | 722 | 726 |
| 41 | VDYP6 | 0 | 0 | 0 | 14 | 93 | 177 | 256 | 327 | 393 | 454 | 510 | 563 | 607 | 649 | 686 | 718 | 745 | 768 | 790 | 813 | 835 | 856 | 881 | 906 | 930 | 954 | 957 | 960 | 963 | 965 | 967 | 970 | 971 | 973 | 975 | 976 |
| 42 | VDYP6 | 0 | 0 | 0 | 0 | 38 | 111 | 181 | 244 | 303 | 357 | 406 | 453 | 491 | 529 | 562 | 591 | 616 | 637 | 660 | 681 | 701 | 721 | 744 | 767 | 789 | 811 | 814 | 818 | 821 | 824 | 826 | 829 | 831 | 833 | 834 | 836 |
| 43 | VDYP6 | 0 | 0 | 0 | 0 | 3 | 36 | 85 | 132 | 177 | 218 | 256 | 292 | 322 | 351 | 376 | 398 | 417 | 432 | 449 | 466 | 481 | 496 | 514 | 531 | 548 | 564 | 567 | 569 | 571 | 573 | 575 | 577 | 578 | 580 | 581 | 582 |
| 44 | VDYP6 | 0 | 0 | 9 | 156 | 301 | 425 | 530 | 618 | 693 | 759 | 817 | 867 | 910 | 951 | 988 | 1,021 | 1,050 | 1,075 | 1,098 | 1,120 | 1,140 | 1,158 | 1,175 | 1,190 | 1,205 | 1,217 | 1,224 | 1,230 | 1,235 | 1,240 | 1,243 | 1,246 | 1,249 | 1,251 | 1,252 | 1,253 |
| 45 | VDYP6 | 0 | 0 | 0 | 67 | 200 | 317 | 418 | 505 | 581 | 649 | 709 | 762 | 809 | 853 | 892 | 927 | 958 | 986 | 1,010 | 1,034 | 1,056 | 1,076 | 1,095 | 1,112 | 1,128 | 1,143 | 1,153 | 1,161 | 1,168 | 1,175 | 1,181 | 1,186 | 1,191 | 1,195 | 1,199 | 1,202 |
| 46 | VDYP6 | 0 | 0 | 0 | 1 | 37 | 118 | 194 | 262 | 323 | 378 | 427 | 472 | 512 | 549 | 583 | 613 | 641 | 665 | 687 | 709 | 730 | 749 | 767 | 784 | 800 | 815 | 824 | 831 | 838 | 845 | 851 | 856 | 861 | 866 | 870 | 874 |
| 47 | VDYP6 | 0 | 0 | 24 | 79 | 182 | 288 | 381 | 461 | 531 | 592 | 645 | 691 | 731 | 769 | 804 | 834 | 861 | 885 | 907 | 927 | 946 | 964 | 981 | 996 | 1,011 | 1,024 | 1,036 | 1,046 | 1,057 | 1,066 | 1,075 | 1,084 | 1,092 | 1,100 | 1,108 | 1,115 |
| 48 | VDYP6 | 0 | 3 | 52 | 149 | 239 | 312 | 369 | 399 | 426 | 449 | 470 | 489 | 506 | 521 | 535 | 547 | 558 | 567 | 576 | 584 | 592 | 599 | 606 | 613 | 620 | 626 | 629 | 632 | 635 | 637 | 640 | 642 | 644 | 646 | 647 | 649 |
| 49 | VDYP7 | 0 | 0 | 41 | 117 | 195 | 267 | 331 | 387 | 435 | 476 | 509 | 534 | 552 | 561 | 563 | 558 | 548 | 536 | 522 | 508 | 493 | 477 | 461 | 445 | 430 | 415 | 400 | 386 | 372 | 358 | 345 | 335 | 327 | 319 | 311 | 304 |
| 61 | VDYP6 | 0 | 0 | 0 | 0 | 0 | 9 | 41 | 80 | 117 | 153 | 186 | 217 | 243 | 267 | 289 | 308 | 324 | 337 | 351 | 365 | 378 | 390 | 404 | 419 | 433 | 446 | 449 | 451 | 454 | 456 | 458 | 460 | 462 | 464 | 465 | 467 |

| Au | Model | age_0 | age_10 | age_20 | age_30 | age_40 | age_50 | age_60 | age_70 | age_80 | age_90 | age_100 | age_110 | age_120 | age_130 | age_140 | age_150 | age_160 | age_170 | age_180 | age_190 | age_200 | age_210 | age_220 | age_230 | age_240 | age_250 | age_260 | age_270 | age_280 | age_290 | age_300 | age_310 | age_320 | age_330 | age_340 | age_350 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62 | VDYP6 | 0 | 0 | 0 | 0 | 2 | 51 | 113 | 169 | 221 | 267 | 310 | 349 | 384 | 417 | 447 | 475 | 500 | 522 | 544 | 565 | 585 | 603 | 620 | 637 | 653 | 667 | 676 | 684 | 692 | 699 | 705 | 711 | 717 | 722 | 727 | 732 |
| 63 | VDYP6 | 0 | 0 | 0 | 0 | 0 | 11 | 46 | 84 | 120 | 154 | 187 | 218 | 243 | 268 | 289 | 307 | 323 | 335 | 349 | 362 | 375 | 387 | 401 | 416 | 430 | 443 | 445 | 446 | 448 | 449 | 450 | 452 | 453 | 454 | 455 | 456 |
| 64 | VDYP6 | 0 | 0 | 0 | 0 | 1 | 40 | 93 | 143 | 189 | 231 | 270 | 306 | 338 | 368 | 396 | 421 | 443 | 463 | 484 | 503 | 521 | 538 | 554 | 570 | 585 | 599 | 606 | 612 | 618 | 624 | 629 | 633 | 638 | 642 | 646 | 649 |
| 67 | VDYP6 | 0 | 0 | 0 | 0 | 0 | 7 | 38 | 80 | 119 | 155 | 189 | 222 | 248 | 274 | 296 | 315 | 332 | 345 | 360 | 374 | 387 | 400 | 415 | 430 | 444 | 458 | 461 | 463 | 466 | 468 | 470 | 473 | 474 | 476 | 478 | 480 |
| 68 | VDYP6 | 0 | 0 | 0 | 0 | 1 | 48 | 111 | 168 | 220 | 267 | 311 | 351 | 386 | 420 | 451 | 479 | 504 | 527 | 549 | 571 | 591 | 610 | 628 | 645 | 662 | 677 | 686 | 694 | 701 | 708 | 714 | 720 | 726 | 731 | 736 | 740 |
| 69 | VDYP6 | 0 | 0 | 0 | 0 | 0 | 8 | 39 | 78 | 114 | 148 | 180 | 211 | 236 | 259 | 280 | 299 | 314 | 327 | 340 | 354 | 366 | 378 | 392 | 406 | 420 | 433 | 435 | 437 | 439 | 441 | 443 | 445 | 447 | 448 | 449 | 451 |
| 70 | VDYP6 | 0 | 0 | 0 | 0 | 0 | 44 | 105 | 161 | 213 | 259 | 302 | 341 | 376 | 408 | 438 | 465 | 490 | 511 | 532 | 553 | 572 | 590 | 607 | 623 | 638 | 653 | 660 | 667 | 673 | 679 | 684 | 689 | 694 | 698 | 702 | 705 |
| 101 | TIPSY | 0 | 0 | 3 | 45 | 126 | 222 | 313 | 402 | 486 | 560 | 628 | 693 | 752 | 805 | 853 | 896 | 934 | 968 | 998 | 1,025 | 1,050 | 1,075 | 1,101 | 1,126 | 1,149 | 1,170 | 1,189 | 1,207 | 1,223 | 1,239 | 1,240 | 1,240 | 1,240 | 1,240 | 1,240 | 1,240 |
| 102 | TIPSY | 0 | 0 | 5 | 67 | 175 | 294 | 401 | 510 | 611 | 697 | 776 | 854 | 926 | 989 | 1,043 | 1,092 | 1,135 | 1,173 | 1,207 | 1,238 | 1,266 | 1,294 | 1,324 | 1,352 | 1,378 | 1,403 | 1,425 | 1,445 | 1,464 | 1,480 | 1,483 | 1,483 | 1,483 | 1,483 | 1,483 | 1,483 |
| 103 | TIPSY | 0 | 0 | 0 | 1 | 11 | 32 | 69 | 106 | 147 | 184 | 221 | 256 | 287 | 314 | 338 | 360 | 381 | 400 | 419 | 436 | 451 | 466 | 481 | 496 | 509 | 521 | 533 | 543 | 553 | 562 | 565 | 565 | 565 | 565 | 565 | 565 |
| 104 | TIPSY | 0 | 0 | 1 | 56 | 196 | 341 | 473 | 590 | 701 | 799 | 889 | 973 | 1,051 | 1,120 | 1,181 | 1,236 | 1,286 | 1,331 | 1,371 | 1,407 | 1,440 | 1,470 | 1,499 | 1,526 | 1,550 | 1,572 | 1,592 | 1,611 | 1,627 | 1,642 | 1,655 | 1,655 | 1,655 | 1,655 | 1,655 | 1,655 |
| 105 | TIPSY | 0 | 0 | 2 | 45 | 155 | 280 | 397 | 504 | 603 | 692 | 773 | 848 | 916 | 978 | 1,034 | 1,085 | 1,132 | 1,173 | 1,210 | 1,244 | 1,275 | 1,303 | 1,330 | 1,355 | 1,378 | 1,399 | 1,418 | 1,436 | 1,452 | 1,466 | 1,476 | 1,476 | 1,476 | 1,476 | 1,476 | 1,476 |
| 106 | TIPSY | 0 | 0 | 1 | 29 | 121 | 231 | 339 | 437 | 526 | 610 | 687 | 755 | 816 | 873 | 927 | 978 | 1,023 | 1,063 | 1,098 | 1,129 | 1,158 | 1,184 | 1,211 | 1,235 | 1,257 | 1,278 | 1,296 | 1,313 | 1,328 | 1,342 | 1,351 | 1,351 | 1,351 | 1,351 | 1,351 | 1,351 |
| 107 | TIPSY | 0 | 0 | 9 | 95 | 235 | 377 | 515 | 644 | 760 | 866 | 961 | 1,045 | 1,118 | 1,179 | 1,234 | 1,281 | 1,323 | 1,358 | 1,387 | 1,411 | 1,429 | 1,445 | 1,459 | 1,469 | 1,479 | 1,487 | 1,495 | 1,501 | 1,506 | 1,510 | 1,511 | 1,511 | 1,511 | 1,511 | 1,511 | 1,511 |
| 108 | TIPSY | 0 | 19 | 79 | 134 | 187 | 231 | 267 | 284 | 166 | 155 | 170 | 187 | 201 | 215 | 229 | 240 | 251 | 259 | 267 | 274 | 281 | 287 | 295 | 302 | 308 | 314 | 319 | 324 | 329 | 333 | 333 | 333 | 333 | 333 | 333 | 333 |
| 111 | TIPSY | 0 | 0 | 2 | 33 | 104 | 189 | 273 | 353 | 428 | 498 | 562 | 621 | 674 | 723 | 767 | 807 | 843 | 876 | 905 | 931 | 954 | 978 | 1,003 | 1,025 | 1,046 | 1,066 | 1,084 | 1,101 | 1,116 | 1,131 | 1,131 | 1,131 | 1,131 | 1,131 | 1,131 | 1,131 |
| 112 | TIPSY | 0 | 0 | 1 | 25 | 88 | 169 | 250 | 325 | 397 | 464 | 525 | 579 | 630 | 678 | 721 | 760 | 795 | 827 | 856 | 881 | 903 | 925 | 948 | 969 | 988 | 1,007 | 1,024 | 1,041 | 1,056 | 1,070 | 1,072 | 1,072 | 1,072 | 1,072 | 1,072 | 1,072 |
| 113 | TIPSY | 0 | 0 | 2 | 33 | 123 | 224 | 326 | 414 | 500 | 582 | 656 | 721 | 779 | 833 | 885 | 933 | 975 | 1,013 | 1,046 | 1,075 | 1,101 | 1,127 | 1,153 | 1,178 | 1,201 | 1,221 | 1,240 | 1,258 | 1,274 | 1,289 | 1,294 | 1,294 | 1,294 | 1,294 | 1,294 | 1,294 |
| 114 | TIPSY | 0 | 0 | 1 | 46 | 179 | 319 | 449 | 562 | 668 | 765 | 853 | 933 | 1,007 | 1,076 | 1,137 | 1,193 | 1,242 | 1,286 | 1,326 | 1,362 | 1,395 | 1,424 | 1,453 | 1,479 | 1,503 | 1,525 | 1,545 | 1,563 | 1,579 | 1,594 | 1,607 | 1,607 | 1,607 | 1,607 | 1,607 | 1,607 |
| 115 | TIPSY | 0 | 0 | 1 | 40 | 155 | 279 | 396 | 500 | 597 | 686 | 767 | 842 | 910 | 973 | 1,030 | 1,081 | 1,127 | 1,169 | 1,206 | 1,240 | 1,270 | 1,298 | 1,325 | 1,350 | 1,373 | 1,394 | 1,413 | 1,431 | 1,447 | 1,461 | 1,470 | 1,470 | 1,470 | 1,470 | 1,470 | 1,470 |
| 116 | TIPSY | 0 | 0 | 1 | 29 | 118 | 227 | 334 | 431 | 519 | 602 | 677 | 745 | 807 | 864 | 918 | 967 | 1,010 | 1,048 | 1,083 | 1,115 | 1,144 | 1,171 | 1,197 | 1,221 | 1,243 | 1,264 | 1,282 | 1,299 | 1,315 | 1,329 | 1,338 | 1,338 | 1,338 | 1,338 | 1,338 | 1,338 |
| 117 | TIPSY | 0 | 0 | 5 | 82 | 213 | 347 | 475 | 602 | 710 | 812 | 908 | 992 | 1,064 | 1,127 | 1,174 | 1,217 | 1,256 | 1,291 | 1,321 | 1,346 | 1,368 | 1,386 | 1,402 | 1,417 | 1,431 | 1,443 | 1,454 | 1,463 | 1,470 | 1,477 | 1,477 | 1,477 | 1,477 | 1,477 | 1,477 | 1,477 |
| 118 | TIPSY | 0 | 19 | 82 | 137 | 188 | 232 | 267 | 285 | 160 | 146 | 160 | 177 | 192 | 205 | 217 | 228 | 238 | 246 | 254 | 260 | 266 | 273 | 280 | 287 | 293 | 299 | 304 | 309 | 314 | 318 | 318 | 318 | 318 | 318 | 318 | 318 |
| 119 | VDYP7 | 0 | 0 | 41 | 117 | 195 | 267 | 331 | 387 | 435 | 476 | 509 | 534 | 552 | 561 | 563 | 558 | 548 | 536 | 522 | 508 | 493 | 477 | 461 | 445 | 430 | 415 | 400 | 386 | 372 | 358 | 345 | 335 | 327 | 319 | 311 | 304 |
| 120 | TIPSY | 0 | 0 | 4 | 55 | 139 | 227 | 308 | 388 | 466 | 536 | 597 | 654 | 707 | 754 | 797 | 834 | 867 | 895 | 922 | 946 | 969 | 990 | 1,010 | 1,028 | 1,045 | 1,061 | 1,076 | 1,090 | 1,101 | 1,111 | 1,111 | 1,111 | 1,111 | 1,111 | 1,111 | 1,111 |
| 131 | TIPSY | 0 | 0 | 24 | 147 | 304 | 460 | 617 | 752 | 886 | 1,002 | 1,111 | 1,203 | 1,284 | 1,363 | 1,434 | 1,492 | 1,543 | 1,592 | 1,634 | 1,672 | 1,706 | 1,742 | 1,780 | 1,816 | 1,849 | 1,878 | 1,905 | 1,930 | 1,938 | 1,945 | 1,946 | 1,946 | 1,946 | 1,946 | 1,946 | 1,946 |
| 132 | TIPSY | 0 | 0 | 0 | 4 | 31 | 79 | 132 | 184 | 238 | 288 | 331 | 369 | 404 | 440 | 474 | 504 | 532 | 556 | 578 | 599 | 616 | 635 | 651 | 667 | 681 | 694 | 707 | 719 | 730 | 740 | 742 | 742 | 742 | 742 | 742 | 742 |
| 135 | TIPSY | 0 | 0 | 2 | 29 | 111 | 225 | 333 | 433 | 525 | 606 | 679 | 748 | 812 | 868 | 920 | 967 | 1,011 | 1,051 | 1,087 | 1,122 | 1,152 | 1,179 | 1,205 | 1,229 | 1,251 | 1,272 | 1,291 | 1,308 | 1,324 | 1,338 | 1,347 | 1,347 | 1,347 | 1,347 | 1,347 | 1,347 |
| 141 | TIPSY | 0 | 0 | 4 | 38 | 115 | 204 | 293 | 376 | 453 | 527 | 593 | 656 | 711 | 762 | 807 | 848 | 884 | 918 | 948 | 975 | 999 | 1,024 | 1,049 | 1,073 | 1,096 | 1,116 | 1,135 | 1,153 | 1,170 | 1,184 | 1,185 | 1,185 | 1,185 | 1,185 | 1,185 | 1,185 |
| 144 | TIPSY | 0 | 0 | 1 | 43 | 177 | 317 | 446 | 560 | 663 | 761 | 850 | 929 | 1,002 | 1,070 | 1,132 | 1,189 | 1,239 | 1,284 | 1,322 | 1,358 | 1,390 | 1,420 | 1,450 | 1,476 | 1,500 | 1,522 | 1,542 | 1,559 | 1,575 | 1,590 | 1,603 | 1,603 | 1,603 | 1,603 | 1,603 | 1,603 |
| 145 | TIPSY | 0 | 0 | 1 | 33 | 138 | 259 | 371 | 473 | 565 | 651 | 731 | 804 | 868 | 928 | 984 | 1,035 | 1,081 | 1,122 | 1,158 | 1,191 | 1,221 | 1,249 | 1,276 | 1,301 | 1,324 | 1,344 | 1,363 | 1,380 | 1,396 | 1,410 | 1,420 | 1,420 | 1,420 | 1,420 | 1,420 | 1,420 |
| 146 | TIPSY | 0 | 0 | 6 | 83 | 207 | 346 | 475 | 595 | 704 | 800 | 889 | 968 | 1,042 | 1,108 | 1,165 | 1,215 | 1,262 | 1,305 | 1,345 | 1,381 | 1,413 | 1,444 | 1,473 | 1,498 | 1,522 | 1,544 | 1,558 | 1,570 | 1,581 | 1,592 | 1,597 | 1,597 | 1,597 | 1,597 | 1,597 | 1,597 |
| 147 | TIPSY | 0 | 0 | 18 | 128 | 285 | 444 | 595 | 732 | 861 | 970 | 1,064 | 1,150 | 1,225 | 1,289 | 1,339 | 1,384 | 1,426 | 1,464 | 1,496 | 1,505 | 1,510 | 1,515 | 1,519 | 1,522 | 1,525 | 1,527 | 1,528 | 1,529 | 1,530 | 1,531 | 1,531 | 1,531 | 1,531 | 1,531 | 1,531 | 1,531 |
| 148 | TIPSY | 0 | 25 | 95 | 167 | 234 | 289 | 333 | 356 | 224 | 213 | 233 | 254 | 273 | 290 | 306 | 320 | 333 | 343 | 352 | 361 | 368 | 377 | 386 | 394 | 402 | 410 | 417 | 423 | 428 | 433 | 433 | 433 | 433 | 433 | 433 | 433 |
| 162 | TIPSY | 0 | 0 | 1 | 16 | 74 | 165 | 261 | 350 | 430 | 504 | 572 | 632 | 689 | 738 | 784 | 827 | 869 | 905 | 939 | 969 | 997 | 1,023 | 1,047 | 1,069 | 1,089 | 1,109 | 1,127 | 1,144 | 1,160 | 1,174 | 1,183 | 1,183 | 1,183 | 1,183 | 1,183 | 1,183 |

| Au | Model | age_0 | age_10 | age_20 | age_30 | age_40 | age_50 | age_60 | age_70 | age_80 | age_90 | age_100 | age_110 | age_120 | age_130 | age_140 | age_150 | age_160 | age_170 | age_180 | age_190 | age_200 | age_210 | age_220 | age_230 | age_240 | age_250 | age_260 | age_270 | age_280 | age_290 | age_300 | age_310 | age_320 | age_330 | age_340 | age_350 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 163 | TIPSY | 0 | 0 | 1 | 14 | 59 | 121 | 188 | 251 | 310 | 369 | 423 | 470 | 513 | 552 | 588 | 622 | 654 | 683 | 710 | 733 | 753 | 774 | 794 | 813 | 830 | 845 | 859 | 873 | 885 | 897 | 901 | 901 | 901 | 901 | 901 | 901 |
| 164 | TIPSY | 0 | 0 | 0 | 11 | 63 | 144 | 229 | 309 | 384 | 451 | 512 | 571 | 626 | 675 | 720 | 759 | 795 | 829 | 860 | 889 | 916 | 942 | 966 | 989 | 1,009 | 1,027 | 1,044 | 1,060 | 1,074 | 1,087 | 1,095 | 1,095 | 1,095 | 1,095 | 1,095 | 1,095 |
| 167 | TIPSY | 0 | 0 | 0 | 0 | 1 | 7 | 20 | 34 | 55 | 79 | 101 | 122 | 143 | 162 | 179 | 195 | 210 | 224 | 237 | 250 | 261 | 272 | 283 | 294 | 304 | 314 | 321 | 327 | 333 | 339 | 341 | 341 | 341 | 341 | 341 | 341 |
| 169 | TIPSY | 0 | 0 | 0 | 0 | 1 | 7 | 20 | 34 | 55 | 79 | 101 | 122 | 143 | 162 | 179 | 195 | 210 | 224 | 237 | 250 | 261 | 272 | 283 | 294 | 304 | 314 | 321 | 327 | 333 | 339 | 341 | 341 | 341 | 341 | 341 | 341 |
| 201 | TIPSY | 0 | 0 | 2 | 26 | 84 | 160 | 235 | 307 | 374 | 438 | 495 | 546 | 593 | 639 | 679 | 713 | 745 | 774 | 801 | 826 | 848 | 870 | 892 | 911 | 929 | 945 | 960 | 974 | 987 | 1,001 | 1,001 | 1,001 | 1,001 | 1,001 | 1,001 | 1,001 |
| 202 | TIPSY | 0 | 0 | 3 | 45 | 128 | 225 | 319 | 407 | 491 | 566 | 636 | 700 | 757 | 809 | 857 | 900 | 938 | 973 | 1,003 | 1,030 | 1,054 | 1,079 | 1,104 | 1,127 | 1,148 | 1,168 | 1,187 | 1,205 | 1,221 | 1,236 | 1,238 | 1,238 | 1,238 | 1,238 | 1,238 | 1,238 |
| 203 | TIPSY | 0 | 0 | 2 | 37 | 123 | 222 | 319 | 409 | 493 | 571 | 642 | 707 | 766 | 819 | 868 | 912 | 951 | 987 | 1,019 | 1,047 | 1,073 | 1,098 | 1,123 | 1,147 | 1,169 | 1,190 | 1,208 | 1,225 | 1,241 | 1,256 | 1,260 | 1,260 | 1,260 | 1,260 | 1,260 | 1,260 |
| 204 | TIPSY | 0 | 0 | 2 | 47 | 162 | 291 | 414 | 524 | 626 | 719 | 801 | 878 | 948 | 1,013 | 1,071 | 1,123 | 1,169 | 1,211 | 1,248 | 1,283 | 1,314 | 1,343 | 1,371 | 1,397 | 1,421 | 1,443 | 1,462 | 1,480 | 1,496 | 1,510 | 1,522 | 1,522 | 1,522 | 1,522 | 1,522 | 1,522 |
| 205 | TIPSY | 0 | 0 | 2 | 41 | 144 | 265 | 380 | 484 | 580 | 666 | 746 | 818 | 884 | 945 | 1,000 | 1,050 | 1,095 | 1,136 | 1,173 | 1,206 | 1,236 | 1,264 | 1,291 | 1,315 | 1,338 | 1,359 | 1,378 | 1,395 | 1,411 | 1,425 | 1,434 | 1,434 | 1,434 | 1,434 | 1,434 | 1,434 |
| 206 | TIPSY | 0 | 0 | 2 | 39 | 133 | 241 | 348 | 446 | 537 | 619 | 695 | 765 | 828 | 886 | 938 | 985 | 1,028 | 1,067 | 1,102 | 1,133 | 1,162 | 1,189 | 1,214 | 1,238 | 1,260 | 1,280 | 1,298 | 1,315 | 1,330 | 1,343 | 1,352 | 1,352 | 1,352 | 1,352 | 1,352 | 1,352 |
| 207 | TIPSY | 0 | 0 | 6 | 59 | 153 | 258 | 365 | 464 | 557 | 643 | 720 | 789 | 852 | 908 | 957 | 1,000 | 1,037 | 1,070 | 1,099 | 1,123 | 1,144 | 1,164 | 1,182 | 1,197 | 1,212 | 1,225 | 1,236 | 1,245 | 1,253 | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 |
| 208 | TIPSY | 0 | 21 | 87 | 145 | 199 | 244 | 281 | 298 | 163 | 146 | 161 | 176 | 190 | 203 | 215 | 225 | 234 | 242 | 250 | 256 | 262 | 268 | 275 | 281 | 286 | 291 | 296 | 301 | 306 | 310 | 310 | 310 | 310 | 310 | 310 | 310 |
| 210 | TIPSY | 0 | 0 | 43 | 185 | 342 | 502 | 653 | 787 | 902 | 1,006 | 1,094 | 1,170 | 1,239 | 1,303 | 1,357 | 1,402 | 1,442 | 1,479 | 1,497 | 1,513 | 1,528 | 1,541 | 1,553 | 1,565 | 1,575 | 1,586 | 1,595 | 1,605 | 1,614 | 1,622 | 1,622 | 1,622 | 1,622 | 1,622 | 1,622 | 1,622 |
| 211 | TIPSY | 0 | 0 | 3 | 43 | 123 | 216 | 305 | 390 | 470 | 543 | 610 | 671 | 728 | 779 | 825 | 866 | 903 | 935 | 964 | 990 | 1,013 | 1,038 | 1,063 | 1,086 | 1,107 | 1,128 | 1,146 | 1,163 | 1,178 | 1,192 | 1,193 | 1,193 | 1,193 | 1,193 | 1,193 | 1,193 |
| 212 | TIPSY | 0 | 0 | 1 | 26 | 93 | 175 | 256 | 333 | 405 | 471 | 532 | 588 | 640 | 687 | 729 | 768 | 802 | 833 | 860 | 885 | 907 | 929 | 952 | 974 | 994 | 1,013 | 1,030 | 1,046 | 1,061 | 1,075 | 1,077 | 1,077 | 1,077 | 1,077 | 1,077 | 1,077 |
| 213 | TIPSY | 0 | 0 | 1 | 24 | 93 | 178 | 263 | 341 | 415 | 484 | 546 | 604 | 657 | 705 | 749 | 789 | 824 | 856 | 885 | 911 | 934 | 957 | 980 | 1,002 | 1,022 | 1,041 | 1,058 | 1,073 | 1,088 | 1,101 | 1,106 | 1,106 | 1,106 | 1,106 | 1,106 | 1,106 |
| 214 | TIPSY | 0 | 0 | 1 | 52 | 189 | 331 | 463 | 578 | 685 | 784 | 873 | 954 | 1,030 | 1,098 | 1,161 | 1,216 | 1,265 | 1,309 | 1,349 | 1,386 | 1,419 | 1,448 | 1,477 | 1,503 | 1,527 | 1,549 | 1,569 | 1,587 | 1,603 | 1,618 | 1,630 | 1,630 | 1,630 | 1,630 | 1,630 | 1,630 |
| 215 | TIPSY | 0 | 0 | 2 | 42 | 152 | 275 | 391 | 495 | 592 | 680 | 760 | 834 | 902 | 964 | 1,020 | 1,071 | 1,116 | 1,157 | 1,194 | 1,227 | 1,257 | 1,285 | 1,312 | 1,337 | 1,360 | 1,381 | 1,400 | 1,418 | 1,433 | 1,448 | 1,457 | 1,457 | 1,457 | 1,457 | 1,457 | 1,457 |
| 216 | TIPSY | 0 | 0 | 1 | 28 | 112 | 212 | 312 | 405 | 491 | 570 | 642 | 708 | 768 | 824 | 875 | 920 | 962 | 999 | 1,033 | 1,063 | 1,092 | 1,118 | 1,143 | 1,166 | 1,187 | 1,207 | 1,225 | 1,241 | 1,256 | 1,269 | 1,278 | 1,278 | 1,278 | 1,278 | 1,278 | 1,278 |
| 217 | TIPSY | 0 | 0 | 3 | 49 | 148 | 259 | 371 | 475 | 571 | 662 | 745 | 820 | 887 | 948 | 1,003 | 1,052 | 1,096 | 1,133 | 1,167 | 1,196 | 1,222 | 1,245 | 1,266 | 1,284 | 1,300 | 1,313 | 1,324 | 1,334 | 1,343 | 1,350 | 1,351 | 1,351 | 1,351 | 1,351 | 1,351 | 1,351 |
| 218 | TIPSY | 0 | 24 | 95 | 160 | 221 | 272 | 311 | 328 | 177 | 158 | 172 | 189 | 204 | 218 | 231 | 242 | 251 | 260 | 267 | 274 | 280 | 287 | 294 | 301 | 307 | 312 | 318 | 323 | 327 | 332 | 332 | 332 | 332 | 332 | 332 | 332 |
| 219 | VDYP7 | 0 | 0 | 41 | 117 | 195 | 267 | 331 | 387 | 435 | 476 | 509 | 534 | 552 | 561 | 563 | 558 | 548 | 536 | 522 | 508 | 493 | 477 | 461 | 445 | 430 | 415 | 400 | 386 | 372 | 358 | 345 | 335 | 327 | 319 | 311 | 304 |
| 220 | TIPSY | 0 | 0 | 13 | 85 | 188 | 291 | 391 | 486 | 573 | 651 | 721 | 784 | 839 | 888 | 932 | 971 | 1,006 | 1,037 | 1,065 | 1,091 | 1,113 | 1,134 | 1,154 | 1,172 | 1,188 | 1,202 | 1,214 | 1,225 | 1,235 | 1,244 | 1,244 | 1,244 | 1,244 | 1,244 | 1,244 | 1,244 |
| 232 | TIPSY | 0 | 0 | 0 | 8 | 33 | 69 | 113 | 155 | 194 | 228 | 259 | 289 | 317 | 345 | 371 | 396 | 417 | 436 | 454 | 470 | 484 | 498 | 512 | 525 | 537 | 549 | 560 | 570 | 580 | 589 | 589 | 589 | 589 | 589 | 589 | 589 |
| 233 | TIPSY | 0 | 0 | 0 | 1 | 6 | 19 | 37 | 57 | 78 | 100 | 121 | 140 | 157 | 174 | 190 | 203 | 216 | 228 | 238 | 248 | 256 | 266 | 274 | 282 | 290 | 298 | 304 | 312 | 317 | 323 | 323 | 323 | 323 | 323 | 323 | 323 |
| 234 | TIPSY | 0 | 0 | 15 | 103 | 218 | 330 | 447 | 550 | 644 | 734 | 811 | 878 | 936 | 988 | 1,037 | 1,081 | 1,120 | 1,155 | 1,185 | 1,210 | 1,232 | 1,254 | 1,274 | 1,294 | 1,312 | 1,327 | 1,340 | 1,354 | 1,365 | 1,376 | 1,376 | 1,376 | 1,376 | 1,376 | 1,376 | 1,376 |
| 235 | TIPSY | 0 | 0 | 6 | 62 | 154 | 244 | 332 | 421 | 500 | 571 | 638 | 699 | 754 | 801 | 843 | 879 | 913 | 944 | 972 | 998 | 1,022 | 1,044 | 1,064 | 1,081 | 1,097 | 1,112 | 1,125 | 1,137 | 1,148 | 1,158 | 1,158 | 1,158 | 1,158 | 1,158 | 1,158 | 1,158 |
| 236 | TIPSY | 0 | 0 | 0 | 5 | 26 | 57 | 96 | 134 | 169 | 202 | 232 | 259 | 284 | 308 | 330 | 352 | 372 | 390 | 407 | 422 | 436 | 449 | 462 | 474 | 485 | 495 | 505 | 514 | 522 | 530 | 530 | 530 | 530 | 530 | 530 | 530 |
| 238 | TIPSY | 0 | 0 | 5 | 47 | 116 | 186 | 264 | 339 | 401 | 463 | 518 | 568 | 612 | 652 | 688 | 722 | 752 | 780 | 805 | 828 | 848 | 865 | 881 | 897 | 912 | 926 | 939 | 951 | 962 | 972 | 972 | 972 | 972 | 972 | 972 | 972 |
| 241 | TIPSY | 0 | 0 | 3 | 44 | 119 | 200 | 271 | 344 | 415 | 480 | 536 | 587 | 638 | 682 | 722 | 758 | 788 | 815 | 839 | 861 | 883 | 902 | 921 | 939 | 955 | 970 | 984 | 997 | 1,010 | 1,020 | 1,020 | 1,020 | 1,020 | 1,020 | 1,020 | 1,020 |
| 242 | TIPSY | 0 | 0 | 0 | 12 | 43 | 88 | 137 | 182 | 225 | 263 | 299 | 334 | 366 | 397 | 426 | 451 | 475 | 496 | 515 | 533 | 549 | 565 | 580 | 594 | 607 | 619 | 630 | 641 | 650 | 658 | 658 | 658 | 658 | 658 | 658 | 658 |
| 243 | TIPSY | 0 | 0 | 0 | 2 | 11 | 30 | 54 | 81 | 107 | 133 | 157 | 179 | 199 | 218 | 235 | 251 | 265 | 279 | 292 | 304 | 315 | 326 | 336 | 346 | 355 | 363 | 372 | 379 | 386 | 392 | 392 | 392 | 392 | 392 | 392 | 392 |
| 244 | TIPSY | 0 | 0 | 28 | 140 | 274 | 409 | 541 | 659 | 764 | 859 | 942 | 1,014 | 1,078 | 1,133 | 1,185 | 1,229 | 1,268 | 1,304 | 1,335 | 1,362 | 1,385 | 1,408 | 1,429 | 1,449 | 1,463 | 1,475 | 1,486 | 1,496 | 1,505 | 1,513 | 1,513 | 1,513 | 1,513 | 1,513 | 1,513 | 1,513 |
| 245 | TIPSY | 0 | 0 | 6 | 59 | 147 | 235 | 321 | 406 | 482 | 553 | 618 | 677 | 729 | 776 | 817 | 854 | 887 | 918 | 945 | 971 | 994 | 1,014 | 1,033 | 1,051 | 1,066 | 1,081 | 1,094 | 1,106 | 1,118 | 1,127 | 1,127 | 1,127 | 1,127 | 1,127 | 1,127 | 1,127 |
| 246 | TIPSY | 0 | 0 | 0 | 8 | 34 | 71 | 113 | 154 | 192 | 228 | 261 | 292 | 320 | 347 | 371 | 394 | 416 | 435 | 453 | 470 | 485 | 499 | 513 | 525 | 537 | 548 | 558 | 567 | 576 | 584 | 584 | 584 | 584 | 584 | 584 | 584 |

| Au | Model | age_0 | age_10 | age_20 | age_30 | age_40 | age_50 | age_60 | age_70 | age_80 | age_90 | age_100 | age_110 | age_120 | age_130 | age_140 | age_150 | age_160 | age_170 | age_180 | age_190 | age_200 | age_210 | age_220 | age_230 | age_240 | age_250 | age_260 | age_270 | age_280 | age_290 | age_300 | age_310 | age_320 | age_330 | age_340 | age_350 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 247 | TIPSY | 0 | 0 | 5 | 51 | 129 | 210 | 289 | 368 | 438 | 502 | 562 | 618 | 667 | 710 | 749 | 783 | 815 | 844 | 870 | 894 | 916 | 937 | 955 | 972 | 988 | 1,001 | 1,013 | 1,024 | 1,034 | 1,043 | 1,043 | 1,043 | 1,043 | 1,043 | 1,043 | 1,043 |
| 248 | TIPSY | 0 | 0 | 12 | 82 | 181 | 283 | 379 | 473 | 557 | 633 | 700 | 762 | 818 | 867 | 910 | 948 | 983 | 1,014 | 1,041 | 1,067 | 1,088 | 1,109 | 1,129 | 1,148 | 1,164 | 1,179 | 1,192 | 1,204 | 1,214 | 1,223 | 1,223 | 1,223 | 1,223 | 1,223 | 1,223 | 1,223 |
| 249 | TIPSY | 0 | 0 | 30 | 152 | 291 | 437 | 572 | 697 | 808 | 902 | 990 | 1,066 | 1,131 | 1,186 | 1,237 | 1,284 | 1,327 | 1,363 | 1,393 | 1,421 | 1,445 | 1,469 | 1,493 | 1,502 | 1,510 | 1,516 | 1,521 | 1,526 | 1,531 | 1,535 | 1,535 | 1,535 | 1,535 | 1,535 | 1,535 | 1,535 |
| 261 | TIPSY | 0 | 0 | 2 | 43 | 132 | 234 | 332 | 424 | 510 | 589 | 661 | 728 | 788 | 842 | 891 | 936 | 976 | 1,012 | 1,044 | 1,073 | 1,098 | 1,123 | 1,149 | 1,173 | 1,196 | 1,216 | 1,235 | 1,252 | 1,268 | 1,282 | 1,287 | 1,287 | 1,287 | 1,287 | 1,287 | 1,287 |
| 262 | TIPSY | 0 | 0 | 1 | 32 | 116 | 214 | 311 | 402 | 486 | 564 | 635 | 701 | 760 | 815 | 864 | 909 | 951 | 988 | 1,022 | 1,052 | 1,080 | 1,105 | 1,129 | 1,152 | 1,172 | 1,191 | 1,209 | 1,225 | 1,239 | 1,253 | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 |
| 263 | TIPSY | 0 | 0 | 1 | 26 | 96 | 181 | 265 | 344 | 418 | 487 | 550 | 607 | 660 | 709 | 752 | 792 | 828 | 860 | 889 | 915 | 939 | 961 | 985 | 1,006 | 1,027 | 1,045 | 1,062 | 1,078 | 1,093 | 1,106 | 1,110 | 1,110 | 1,110 | 1,110 | 1,110 | 1,110 |
| 264 | TIPSY | 0 | 0 | 0 | 18 | 77 | 152 | 230 | 304 | 375 | 442 | 503 | 560 | 612 | 659 | 703 | 742 | 779 | 812 | 842 | 870 | 895 | 918 | 940 | 961 | 980 | 997 | 1,013 | 1,028 | 1,041 | 1,053 | 1,061 | 1,061 | 1,061 | 1,061 | 1,061 | 1,061 |
| 267 | TIPSY | 0 | 0 | 0 | 0 | 2 | 12 | 25 | 41 | 61 | 79 | 96 | 113 | 128 | 143 | 158 | 171 | 183 | 194 | 204 | 213 | 221 | 229 | 236 | 243 | 250 | 256 | 263 | 269 | 275 | 280 | 280 | 280 | 280 | 280 | 280 | 280 |
| 268 | TIPSY | 0 | 0 | 0 | 1 | 10 | 27 | 50 | 75 | 101 | 127 | 151 | 172 | 192 | 210 | 227 | 241 | 256 | 269 | 281 | 294 | 304 | 315 | 326 | 335 | 344 | 353 | 360 | 368 | 374 | 381 | 381 | 381 | 381 | 381 | 381 | 381 |
| 269 | TIPSY | 0 | 0 | 0 | 0 | 2 | 11 | 25 | 40 | 60 | 78 | 95 | 112 | 128 | 142 | 156 | 169 | 181 | 192 | 202 | 211 | 220 | 227 | 235 | 242 | 249 | 255 | 262 | 267 | 273 | 278 | 278 | 278 | 278 | 278 | 278 | 278 |
| 270 | TIPSY | 0 | 0 | 0 | 1 | 10 | 28 | 51 | 77 | 104 | 130 | 155 | 177 | 197 | 215 | 231 | 247 | 260 | 274 | 286 | 298 | 310 | 321 | 332 | 343 | 352 | 360 | 368 | 375 | 381 | 387 | 387 | 387 | 387 | 387 | 387 | 387 |
| 301 | TIPSY | 0 | 0 | 4 | 49 | 132 | 230 | 321 | 411 | 495 | 569 | 638 | 703 | 761 | 814 | 861 | 903 | 941 | 974 | 1,004 | 1,030 | 1,054 | 1,079 | 1,105 | 1,129 | 1,151 | 1,171 | 1,190 | 1,208 | 1,224 | 1,239 | 1,240 | 1,240 | 1,240 | 1,240 | 1,240 | 1,240 |
| 302 | TIPSY | 0 | 0 | 5 | 71 | 181 | 302 | 410 | 520 | 621 | 707 | 786 | 865 | 936 | 998 | 1,051 | 1,100 | 1,142 | 1,180 | 1,213 | 1,243 | 1,270 | 1,298 | 1,328 | 1,355 | 1,380 | 1,404 | 1,426 | 1,446 | 1,464 | 1,480 | 1,483 | 1,483 | 1,483 | 1,483 | 1,483 | 1,483 |
| 303 | TIPSY | 0 | 0 | 0 | 1 | 12 | 34 | 72 | 109 | 150 | 187 | 224 | 259 | 291 | 316 | 340 | 362 | 383 | 403 | 421 | 438 | 453 | 467 | 483 | 497 | 510 | 522 | 533 | 544 | 553 | 563 | 565 | 565 | 565 | 565 | 565 | 565 |
| 304 | TIPSY | 0 | 0 | 1 | 56 | 197 | 341 | 473 | 591 | 701 | 800 | 890 | 973 | 1,051 | 1,121 | 1,181 | 1,236 | 1,286 | 1,331 | 1,371 | 1,407 | 1,440 | 1,470 | 1,499 | 1,526 | 1,550 | 1,572 | 1,593 | 1,611 | 1,627 | 1,642 | 1,655 | 1,655 | 1,655 | 1,655 | 1,655 | 1,655 |
| 305 | TIPSY | 0 | 0 | 2 | 46 | 156 | 281 | 399 | 506 | 604 | 693 | 775 | 850 | 918 | 979 | 1,035 | 1,087 | 1,133 | 1,174 | 1,211 | 1,245 | 1,275 | 1,303 | 1,330 | 1,355 | 1,378 | 1,399 | 1,418 | 1,436 | 1,452 | 1,466 | 1,476 | 1,476 | 1,476 | 1,476 | 1,476 | 1,476 |
| 306 | TIPSY | 0 | 0 | 1 | 29 | 122 | 233 | 341 | 439 | 527 | 612 | 689 | 756 | 817 | 875 | 929 | 979 | 1,024 | 1,064 | 1,098 | 1,130 | 1,158 | 1,185 | 1,211 | 1,235 | 1,258 | 1,278 | 1,296 | 1,313 | 1,328 | 1,342 | 1,351 | 1,351 | 1,351 | 1,351 | 1,351 | 1,351 |
| 307 | TIPSY | 0 | 0 | 9 | 95 | 235 | 377 | 515 | 644 | 760 | 866 | 961 | 1,045 | 1,118 | 1,179 | 1,234 | 1,281 | 1,323 | 1,358 | 1,387 | 1,411 | 1,429 | 1,445 | 1,459 | 1,469 | 1,479 | 1,487 | 1,495 | 1,501 | 1,506 | 1,510 | 1,511 | 1,511 | 1,511 | 1,511 | 1,511 | 1,511 |
| 308 | TIPSY | 0 | 19 | 80 | 135 | 189 | 234 | 270 | 287 | 169 | 158 | 174 | 190 | 205 | 219 | 232 | 243 | 253 | 262 | 269 | 276 | 282 | 289 | 296 | 303 | 309 | 314 | 320 | 324 | 329 | 333 | 333 | 333 | 333 | 333 | 333 | 333 |
| 311 | TIPSY | 0 | 0 | 3 | 36 | 109 | 195 | 281 | 361 | 436 | 507 | 570 | 629 | 683 | 731 | 774 | 814 | 850 | 882 | 910 | 936 | 959 | 982 | 1,005 | 1,027 | 1,048 | 1,067 | 1,085 | 1,101 | 1,117 | 1,131 | 1,132 | 1,132 | 1,132 | 1,132 | 1,132 | 1,132 |
| 312 | TIPSY | 0 | 0 | 1 | 26 | 92 | 175 | 256 | 331 | 404 | 471 | 531 | 586 | 637 | 684 | 727 | 766 | 800 | 832 | 860 | 884 | 906 | 928 | 950 | 971 | 990 | 1,008 | 1,025 | 1,041 | 1,056 | 1,070 | 1,072 | 1,072 | 1,072 | 1,072 | 1,072 | 1,072 |
| 313 | TIPSY | 0 | 0 | 2 | 36 | 127 | 230 | 332 | 420 | 507 | 589 | 663 | 727 | 784 | 839 | 891 | 938 | 980 | 1,017 | 1,050 | 1,079 | 1,104 | 1,129 | 1,155 | 1,180 | 1,202 | 1,222 | 1,241 | 1,258 | 1,274 | 1,289 | 1,294 | 1,294 | 1,294 | 1,294 | 1,294 | 1,294 |
| 314 | TIPSY | 0 | 0 | 1 | 46 | 179 | 319 | 449 | 563 | 668 | 765 | 853 | 933 | 1,008 | 1,076 | 1,137 | 1,193 | 1,242 | 1,286 | 1,326 | 1,362 | 1,395 | 1,425 | 1,453 | 1,479 | 1,503 | 1,525 | 1,545 | 1,563 | 1,579 | 1,594 | 1,607 | 1,607 | 1,607 | 1,607 | 1,607 | 1,607 |
| 315 | TIPSY | 0 | 0 | 1 | 41 | 156 | 280 | 397 | 501 | 598 | 687 | 769 | 843 | 912 | 974 | 1,031 | 1,082 | 1,128 | 1,169 | 1,207 | 1,240 | 1,271 | 1,299 | 1,326 | 1,351 | 1,374 | 1,395 | 1,414 | 1,431 | 1,447 | 1,461 | 1,470 | 1,470 | 1,470 | 1,470 | 1,470 | 1,470 |
| 316 | TIPSY | 0 | 0 | 1 | 29 | 119 | 228 | 335 | 432 | 521 | 604 | 679 | 746 | 808 | 865 | 919 | 968 | 1,011 | 1,049 | 1,084 | 1,116 | 1,145 | 1,171 | 1,197 | 1,221 | 1,243 | 1,264 | 1,283 | 1,299 | 1,315 | 1,329 | 1,338 | 1,338 | 1,338 | 1,338 | 1,338 | 1,338 |
| 317 | TIPSY | 0 | 0 | 5 | 82 | 213 | 347 | 475 | 602 | 710 | 812 | 908 | 992 | 1,064 | 1,127 | 1,174 | 1,217 | 1,256 | 1,291 | 1,321 | 1,346 | 1,368 | 1,386 | 1,402 | 1,417 | 1,431 | 1,443 | 1,454 | 1,463 | 1,470 | 1,477 | 1,477 | 1,477 | 1,477 | 1,477 | 1,477 | 1,477 |
| 318 | TIPSY | 0 | 19 | 82 | 138 | 191 | 234 | 270 | 288 | 163 | 149 | 164 | 180 | 195 | 208 | 220 | 231 | 240 | 248 | 256 | 262 | 268 | 274 | 281 | 288 | 294 | 300 | 305 | 309 | 314 | 318 | 318 | 318 | 318 | 318 | 318 | 318 |
| 319 | VDYP7 | 0 | 0 | 41 | 117 | 195 | 267 | 331 | 387 | 435 | 476 | 509 | 534 | 552 | 561 | 563 | 558 | 548 | 536 | 522 | 508 | 493 | 477 | 461 | 445 | 430 | 415 | 400 | 386 | 372 | 358 | 345 | 335 | 327 | 319 | 311 | 304 |
| 320 | TIPSY | 0 | 0 | 5 | 59 | 144 | 232 | 314 | 395 | 474 | 544 | 603 | 661 | 714 | 761 | 803 | 840 | 872 | 901 | 926 | 950 | 972 | 993 | 1,012 | 1,030 | 1,047 | 1,063 | 1,077 | 1,091 | 1,102 | 1,111 | 1,111 | 1,111 | 1,111 | 1,111 | 1,111 | 1,111 |
| 331 | TIPSY | 0 | 0 | 18 | 111 | 230 | 347 | 467 | 572 | 672 | 761 | 839 | 905 | 966 | 1,020 | 1,071 | 1,114 | 1,151 | 1,183 | 1,212 | 1,240 | 1,264 | 1,286 | 1,308 | 1,326 | 1,343 | 1,358 | 1,372 | 1,385 | 1,397 | 1,409 | 1,409 | 1,409 | 1,409 | 1,409 | 1,409 | 1,409 |
| 332 | TIPSY | 0 | 0 | 0 | 5 | 25 | 56 | 95 | 132 | 168 | 201 | 230 | 256 | 281 | 304 | 328 | 350 | 370 | 389 | 405 | 420 | 433 | 447 | 459 | 471 | 482 | 492 | 502 | 510 | 519 | 527 | 527 | 527 | 527 | 527 | 527 | 527 |
| 335 | TIPSY | 0 | 0 | 2 | 43 | 115 | 193 | 264 | 333 | 403 | 467 | 521 | 573 | 621 | 664 | 704 | 739 | 769 | 796 | 820 | 842 | 862 | 882 | 900 | 917 | 934 | 949 | 963 | 976 | 987 | 995 | 995 | 995 | 995 | 995 | 995 | 995 |
| 341 | TIPSY | 0 | 0 | 6 | 61 | 153 | 243 | 329 | 416 | 496 | 565 | 631 | 692 | 746 | 793 | 835 | 871 | 904 | 935 | 962 | 987 | 1,009 | 1,031 | 1,053 | 1,072 | 1,091 | 1,104 | 1,116 | 1,127 | 1,137 | 1,146 | 1,146 | 1,146 | 1,146 | 1,146 | 1,146 | 1,146 |
| 344 | TIPSY | 0 | 0 | 15 | 99 | 213 | 322 | 434 | 541 | 628 | 714 | 793 | 861 | 919 | 969 | 1,014 | 1,056 | 1,094 | 1,130 | 1,162 | 1,191 | 1,215 | 1,235 | 1,255 | 1,270 | 1,284 | 1,298 | 1,311 | 1,322 | 1,332 | 1,341 | 1,341 | 1,341 | 1,341 | 1,341 | 1,341 | 1,341 |
| 345 | TIPSY | 0 | 0 | 6 | 60 | 151 | 241 | 328 | 415 | 495 | 563 | 631 | 692 | 746 | 793 | 834 | 871 | 904 | 935 | 962 | 988 | 1,011 | 1,034 | 1,055 | 1,072 | 1,089 | 1,103 | 1,115 | 1,126 | 1,136 | 1,146 | 1,146 | 1,146 | 1,146 | 1,146 | 1,146 | 1,146 |

| Au | Model | age_0 | age_10 | age_20 | age_30 | age_40 | age_50 | age_60 | age_70 | age_80 | age_90 | age_100 | age_110 | age_120 | age_130 | age_140 | age_150 | age_160 | age_170 | age_180 | age_190 | age_200 | age_210 | age_220 | age_230 | age_240 | age_250 | age_260 | age_270 | age_280 | age_290 | age_300 | age_310 | age_320 | age_330 | age_340 | age_350 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 346 | TIPSY | 0 | 0 | 0 | 5 | 25 | 56 | 95 | 132 | 168 | 201 | 230 | 256 | 281 | 304 | 328 | 350 | 370 | 389 | 405 | 420 | 433 | 447 | 459 | 471 | 482 | 492 | 502 | 510 | 519 | 527 | 527 | 527 | 527 | 527 | 527 | 527 |
| 347 | TIPSY | 0 | 0 | 23 | 127 | 249 | 378 | 500 | 612 | 714 | 805 | 880 | 948 | 1,011 | 1,069 | 1,119 | 1,159 | 1,194 | 1,227 | 1,258 | 1,285 | 1,309 | 1,330 | 1,352 | 1,371 | 1,388 | 1,404 | 1,421 | 1,435 | 1,449 | 1,462 | 1,462 | 1,462 | 1,462 | 1,462 | 1,462 | 1,462 |
| 348 | TIPSY | 0 | 0 | 11 | 80 | 176 | 273 | 371 | 456 | 541 | 617 | 685 | 742 | 793 | 842 | 887 | 927 | 963 | 993 | 1,018 | 1,040 | 1,061 | 1,083 | 1,103 | 1,121 | 1,138 | 1,152 | 1,166 | 1,178 | 1,189 | 1,199 | 1,199 | 1,199 | 1,199 | 1,199 | 1,199 | 1,199 |
| 362 | TIPSY | 0 | 0 | 1 | 17 | 75 | 167 | 262 | 351 | 431 | 505 | 573 | 634 | 690 | 739 | 785 | 828 | 870 | 906 | 940 | 970 | 998 | 1,023 | 1,047 | 1,069 | 1,090 | 1,109 | 1,128 | 1,144 | 1,160 | 1,174 | 1,183 | 1,183 | 1,183 | 1,183 | 1,183 | 1,183 |
| 363 | TIPSY | 0 | 0 | 1 | 14 | 61 | 124 | 192 | 255 | 315 | 373 | 427 | 474 | 517 | 556 | 591 | 626 | 658 | 686 | 713 | 735 | 756 | 776 | 796 | 814 | 830 | 846 | 860 | 873 | 886 | 897 | 901 | 901 | 901 | 901 | 901 | 901 |
| 364 | TIPSY | 0 | 0 | 0 | 12 | 64 | 145 | 230 | 310 | 385 | 452 | 514 | 572 | 627 | 676 | 721 | 760 | 796 | 829 | 861 | 890 | 917 | 942 | 967 | 989 | 1,009 | 1,027 | 1,044 | 1,060 | 1,074 | 1,087 | 1,095 | 1,095 | 1,095 | 1,095 | 1,095 | 1,095 |
| 367 | TIPSY | 0 | 0 | 0 | 0 | 2 | 7 | 19 | 31 | 49 | 66 | 81 | 96 | 110 | 123 | 135 | 147 | 157 | 167 | 177 | 186 | 194 | 202 | 210 | 217 | 225 | 232 | 238 | 243 | 247 | 252 | 252 | 252 | 252 | 252 | 252 | 252 |
| 369 | TIPSY | 0 | 0 | 0 | 0 | 2 | 7 | 19 | 31 | 49 | 66 | 81 | 96 | 110 | 123 | 135 | 147 | 157 | 167 | 177 | 186 | 194 | 202 | 210 | 217 | 225 | 232 | 238 | 243 | 247 | 252 | 252 | 252 | 252 | 252 | 252 | 252 |
| 401 | TIPSY | 0 | 0 | 2 | 32 | 111 | 197 | 292 | 370 | 445 | 521 | 591 | 654 | 705 | 749 | 788 | 833 | 874 | 911 | 945 | 970 | 993 | 1,017 | 1,041 | 1,063 | 1,083 | 1,102 | 1,120 | 1,137 | 1,154 | 1,168 | 1,169 | 1,169 | 1,169 | 1,169 | 1,169 | 1,169 |
| 402 | TIPSY | 0 | 0 | 4 | 58 | 157 | 269 | 371 | 470 | 564 | 648 | 722 | 792 | 857 | 917 | 970 | 1,016 | 1,057 | 1,093 | 1,125 | 1,154 | 1,180 | 1,207 | 1,235 | 1,260 | 1,284 | 1,306 | 1,326 | 1,344 | 1,362 | 1,377 | 1,379 | 1,379 | 1,379 | 1,379 | 1,379 | 1,379 |
| 403 | TIPSY | 0 | 0 | 4 | 45 | 130 | 229 | 325 | 415 | 500 | 577 | 648 | 713 | 772 | 826 | 875 | 917 | 956 | 991 | 1,022 | 1,050 | 1,075 | 1,100 | 1,126 | 1,150 | 1,172 | 1,191 | 1,209 | 1,226 | 1,241 | 1,254 | 1,259 | 1,259 | 1,259 | 1,259 | 1,259 | 1,259 |
| 404 | TIPSY | 0 | 0 | 1 | 46 | 160 | 285 | 403 | 513 | 613 | 703 | 788 | 864 | 934 | 996 | 1,051 | 1,103 | 1,151 | 1,193 | 1,229 | 1,263 | 1,294 | 1,322 | 1,350 | 1,376 | 1,399 | 1,419 | 1,438 | 1,456 | 1,472 | 1,487 | 1,498 | 1,498 | 1,498 | 1,498 | 1,498 | 1,498 |
| 405 | TIPSY | 0 | 0 | 2 | 39 | 153 | 279 | 399 | 507 | 602 | 692 | 777 | 851 | 917 | 978 | 1,035 | 1,088 | 1,137 | 1,181 | 1,218 | 1,252 | 1,282 | 1,309 | 1,337 | 1,362 | 1,386 | 1,406 | 1,426 | 1,443 | 1,458 | 1,473 | 1,482 | 1,482 | 1,482 | 1,482 | 1,482 | 1,482 |
| 406 | TIPSY | 0 | 0 | 1 | 33 | 142 | 264 | 380 | 486 | 579 | 668 | 752 | 824 | 886 | 947 | 1,005 | 1,057 | 1,107 | 1,152 | 1,187 | 1,218 | 1,247 | 1,275 | 1,302 | 1,327 | 1,351 | 1,372 | 1,389 | 1,406 | 1,421 | 1,435 | 1,445 | 1,445 | 1,445 | 1,445 | 1,445 | 1,445 |
| 410 | TIPSY | 0 | 0 | 23 | 126 | 250 | 376 | 502 | 608 | 715 | 806 | 884 | 949 | 1,012 | 1,069 | 1,123 | 1,168 | 1,203 | 1,234 | 1,262 | 1,289 | 1,313 | 1,336 | 1,359 | 1,378 | 1,395 | 1,410 | 1,424 | 1,437 | 1,449 | 1,461 | 1,461 | 1,461 | 1,461 | 1,461 | 1,461 | 1,461 |
| 411 | TIPSY | 0 | 0 | 2 | 31 | 93 | 172 | 250 | 326 | 397 | 459 | 518 | 575 | 625 | 670 | 711 | 747 | 780 | 809 | 835 | 859 | 880 | 902 | 926 | 948 | 968 | 987 | 1,004 | 1,019 | 1,034 | 1,047 | 1,048 | 1,048 | 1,048 | 1,048 | 1,048 | 1,048 |
| 412 | TIPSY | 0 | 0 | 2 | 28 | 93 | 175 | 256 | 335 | 405 | 469 | 531 | 589 | 641 | 688 | 729 | 766 | 799 | 829 | 857 | 882 | 905 | 928 | 952 | 974 | 995 | 1,014 | 1,031 | 1,047 | 1,062 | 1,075 | 1,077 | 1,077 | 1,077 | 1,077 | 1,077 | 1,077 |
| 413 | TIPSY | 0 | 0 | 2 | 28 | 100 | 187 | 275 | 355 | 430 | 501 | 566 | 625 | 678 | 727 | 771 | 812 | 849 | 882 | 911 | 937 | 961 | 984 | 1,008 | 1,030 | 1,051 | 1,070 | 1,087 | 1,103 | 1,117 | 1,130 | 1,135 | 1,135 | 1,135 | 1,135 | 1,135 | 1,135 |
| 414 | TIPSY | 0 | 0 | 1 | 39 | 154 | 283 | 405 | 515 | 615 | 705 | 789 | 866 | 937 | 1,001 | 1,058 | 1,110 | 1,157 | 1,201 | 1,239 | 1,274 | 1,306 | 1,335 | 1,362 | 1,388 | 1,412 | 1,433 | 1,452 | 1,470 | 1,486 | 1,501 | 1,513 | 1,513 | 1,513 | 1,513 | 1,513 | 1,513 |
| 415 | TIPSY | 0 | 0 | 2 | 38 | 140 | 258 | 372 | 476 | 569 | 654 | 734 | 807 | 873 | 932 | 986 | 1,035 | 1,081 | 1,122 | 1,160 | 1,193 | 1,222 | 1,249 | 1,276 | 1,300 | 1,323 | 1,343 | 1,362 | 1,379 | 1,395 | 1,409 | 1,418 | 1,418 | 1,418 | 1,418 | 1,418 | 1,418 |
| 416 | TIPSY | 0 | 0 | 1 | 14 | 58 | 126 | 208 | 288 | 360 | 425 | 486 | 543 | 595 | 641 | 682 | 721 | 757 | 789 | 819 | 847 | 872 | 896 | 918 | 939 | 958 | 976 | 993 | 1,007 | 1,022 | 1,035 | 1,042 | 1,042 | 1,042 | 1,042 | 1,042 | 1,042 |
| 419 | TIPSY | 0 | 0 | 51 | 125 | 198 | 268 | 315 | 325 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 |
| 420 | TIPSY | 0 | 0 | 8 | 58 | 134 | 215 | 297 | 372 | 443 | 507 | 565 | 616 | 662 | 705 | 745 | 780 | 810 | 837 | 862 | 883 | 903 | 923 | 941 | 958 | 974 | 988 | 1,000 | 1,012 | 1,023 | 1,033 | 1,033 | 1,033 | 1,033 | 1,033 | 1,033 | 1,033 |
| 461 | TIPSY | 0 | 0 | 1 | 9 | 31 | 65 | 103 | 143 | 186 | 227 | 266 | 299 | 330 | 359 | 388 | 414 | 438 | 459 | 478 | 495 | 510 | 524 | 539 | 553 | 566 | 578 | 590 | 601 | 610 | 618 | 621 | 621 | 621 | 621 | 621 | 621 |
| 462 | TIPSY | 0 | 0 | 0 | 1 | 8 | 26 | 59 | 101 | 147 | 191 | 232 | 271 | 306 | 338 | 367 | 395 | 421 | 446 | 469 | 488 | 507 | 523 | 539 | 554 | 568 | 582 | 594 | 606 | 616 | 627 | 633 | 633 | 633 | 633 | 633 | 633 |
| 463 | TIPSY | 0 | 0 | 0 | 2 | 12 | 31 | 57 | 88 | 122 | 154 | 185 | 214 | 240 | 265 | 288 | 310 | 330 | 349 | 365 | 380 | 392 | 405 | 417 | 429 | 441 | 451 | 461 | 470 | 477 | 485 | 487 | 487 | 487 | 487 | 487 | 487 |
| 464 | TIPSY | 0 | 0 | 0 | 9 | 44 | 96 | 157 | 219 | 281 | 337 | 391 | 441 | 486 | 526 | 563 | 598 | 631 | 662 | 690 | 715 | 737 | 757 | 777 | 795 | 812 | 829 | 843 | 857 | 869 | 881 | 889 | 889 | 889 | 889 | 889 | 889 |
| 601 | TIPSY | 0 | 0 | 2 | 32 | 111 | 197 | 292 | 370 | 445 | 521 | 591 | 654 | 705 | 749 | 788 | 833 | 874 | 911 | 945 | 970 | 993 | 1,017 | 1,041 | 1,063 | 1,083 | 1,102 | 1,120 | 1,137 | 1,154 | 1,168 | 1,169 | 1,169 | 1,169 | 1,169 | 1,169 | 1,169 |
| 602 | TIPSY | 0 | 0 | 4 | 58 | 157 | 269 | 371 | 470 | 564 | 648 | 722 | 792 | 857 | 917 | 970 | 1,016 | 1,057 | 1,093 | 1,125 | 1,154 | 1,180 | 1,207 | 1,235 | 1,260 | 1,284 | 1,306 | 1,326 | 1,344 | 1,362 | 1,377 | 1,379 | 1,379 | 1,379 | 1,379 | 1,379 | 1,379 |
| 603 | TIPSY | 0 | 0 | 4 | 45 | 130 | 229 | 325 | 415 | 500 | 577 | 648 | 713 | 772 | 826 | 875 | 917 | 956 | 991 | 1,022 | 1,050 | 1,075 | 1,100 | 1,126 | 1,150 | 1,172 | 1,191 | 1,209 | 1,226 | 1,241 | 1,254 | 1,259 | 1,259 | 1,259 | 1,259 | 1,259 | 1,259 |
| 604 | TIPSY | 0 | 0 | 1 | 46 | 160 | 285 | 403 | 513 | 613 | 703 | 788 | 864 | 934 | 996 | 1,051 | 1,103 | 1,151 | 1,193 | 1,229 | 1,263 | 1,294 | 1,322 | 1,350 | 1,376 | 1,399 | 1,419 | 1,438 | 1,456 | 1,472 | 1,487 | 1,498 | 1,498 | 1,498 | 1,498 | 1,498 | 1,498 |
| 605 | TIPSY | 0 | 0 | 2 | 39 | 153 | 279 | 399 | 507 | 602 | 692 | 777 | 851 | 917 | 978 | 1,035 | 1,088 | 1,137 | 1,181 | 1,218 | 1,252 | 1,282 | 1,309 | 1,337 | 1,362 | 1,386 | 1,406 | 1,426 | 1,443 | 1,458 | 1,473 | 1,482 | 1,482 | 1,482 | 1,482 | 1,482 | 1,482 |
| 606 | TIPSY | 0 | 0 | 1 | 33 | 142 | 264 | 380 | 486 | 579 | 668 | 752 | 824 | 886 | 947 | 1,005 | 1,057 | 1,107 | 1,152 | 1,187 | 1,218 | 1,247 | 1,275 | 1,302 | 1,327 | 1,351 | 1,372 | 1,389 | 1,406 | 1,421 | 1,435 | 1,445 | 1,445 | 1,445 | 1,445 | 1,445 | 1,445 |
| 610 | TIPSY | 0 | 0 | 23 | 126 | 250 | 376 | 502 | 608 | 715 | 806 | 884 | 949 | 1,012 | 1,069 | 1,123 | 1,168 | 1,203 | 1,234 | 1,262 | 1,289 | 1,313 | 1,336 | 1,359 | 1,378 | 1,395 | 1,410 | 1,424 | 1,437 | 1,449 | 1,461 | 1,461 | 1,461 | 1,461 | 1,461 | 1,461 | 1,461 |
| 611 | TIPSY | 0 | 0 | 2 | 31 | 93 | 172 | 250 | 326 | 397 | 459 | 518 | 575 | 625 | 670 | 711 | 747 | 780 | 809 | 835 | 859 | 880 | 902 | 926 | 948 | 968 | 987 | 1,004 | 1,019 | 1,034 | 1,047 | 1,048 | 1,048 | 1,048 | 1,048 | 1,048 | 1,048 |

| Au | Model | age_0 | age_10 | age_20 | age_30 | age_40 | age_50 | age_60 | age_70 | age_80 | age_90 | age_100 | age_110 | age_120 | age_130 | age_140 | age_150 | age_160 | age_170 | age_180 | age_190 | age_200 | age_210 | age_220 | age_230 | age_240 | age_250 | age_260 | age_270 | age_280 | age_290 | age_300 | age_310 | age_320 | age_330 | age_340 | age_350 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 612 | TIPSY | 0 | 0 | 2 | 28 | 93 | 175 | 256 | 335 | 405 | 469 | 531 | 589 | 641 | 688 | 729 | 766 | 799 | 829 | 857 | 882 | 905 | 928 | 952 | 974 | 995 | 1,014 | 1,031 | 1,047 | 1,062 | 1,075 | 1,077 | 1,077 | 1,077 | 1,077 | 1,077 | 1,077 |
| 613 | TIPSY | 0 | 0 | 2 | 28 | 100 | 187 | 275 | 355 | 430 | 501 | 566 | 625 | 678 | 727 | 771 | 812 | 849 | 882 | 911 | 937 | 961 | 984 | 1,008 | 1,030 | 1,051 | 1,070 | 1,087 | 1,103 | 1,117 | 1,130 | 1,135 | 1,135 | 1,135 | 1,135 | 1,135 | 1,135 |
| 614 | TIPSY | 0 | 0 | 1 | 39 | 154 | 283 | 405 | 515 | 615 | 705 | 789 | 866 | 937 | 1,001 | 1,058 | 1,110 | 1,157 | 1,201 | 1,239 | 1,274 | 1,306 | 1,335 | 1,362 | 1,388 | 1,412 | 1,433 | 1,452 | 1,470 | 1,486 | 1,501 | 1,513 | 1,513 | 1,513 | 1,513 | 1,513 | 1,513 |
| 615 | TIPSY | 0 | 0 | 2 | 38 | 140 | 258 | 372 | 476 | 569 | 654 | 734 | 807 | 873 | 932 | 986 | 1,035 | 1,081 | 1,122 | 1,160 | 1,193 | 1,222 | 1,249 | 1,276 | 1,300 | 1,323 | 1,343 | 1,362 | 1,379 | 1,395 | 1,409 | 1,418 | 1,418 | 1,418 | 1,418 | 1,418 | 1,418 |
| 616 | TIPSY | 0 | 0 | 1 | 14 | 58 | 126 | 208 | 288 | 360 | 425 | 486 | 543 | 595 | 641 | 682 | 721 | 757 | 789 | 819 | 847 | 872 | 896 | 918 | 939 | 958 | 976 | 993 | 1,007 | 1,022 | 1,035 | 1,042 | 1,042 | 1,042 | 1,042 | 1,042 | 1,042 |
| 619 | TIPSY | 0 | 0 | 51 | 125 | 198 | 268 | 315 | 325 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 | 332 |
| 620 | TIPSY | 0 | 0 | 8 | 58 | 134 | 215 | 297 | 372 | 443 | 507 | 565 | 616 | 662 | 705 | 745 | 780 | 810 | 837 | 862 | 883 | 903 | 923 | 941 | 958 | 974 | 988 | 1,000 | 1,012 | 1,023 | 1,033 | 1,033 | 1,033 | 1,033 | 1,033 | 1,033 | 1,033 |
| 661 | TIPSY | 0 | 0 | 1 | 9 | 31 | 65 | 103 | 143 | 186 | 227 | 266 | 299 | 330 | 359 | 388 | 414 | 438 | 459 | 478 | 495 | 510 | 524 | 539 | 553 | 566 | 578 | 590 | 601 | 610 | 618 | 621 | 621 | 621 | 621 | 621 | 621 |
| 662 | TIPSY | 0 | 0 | 0 | 1 | 8 | 26 | 59 | 101 | 147 | 191 | 232 | 271 | 306 | 338 | 367 | 395 | 421 | 446 | 469 | 488 | 507 | 523 | 539 | 554 | 568 | 582 | 594 | 606 | 616 | 627 | 633 | 633 | 633 | 633 | 633 | 633 |
| 663 | TIPSY | 0 | 0 | 0 | 2 | 12 | 31 | 57 | 88 | 122 | 154 | 185 | 214 | 240 | 265 | 288 | 310 | 330 | 349 | 365 | 380 | 392 | 405 | 417 | 429 | 441 | 451 | 461 | 470 | 477 | 485 | 487 | 487 | 487 | 487 | 487 | 487 |
| 664 | TIPSY | 0 | 0 | 0 | 9 | 44 | 96 | 157 | 219 | 281 | 337 | 391 | 441 | 486 | 526 | 563 | 598 | 631 | 662 | 690 | 715 | 737 | 757 | 777 | 795 | 812 | 829 | 843 | 857 | 869 | 881 | 889 | 889 | 889 | 889 | 889 | 889 |

# APPENDIX II
# EBM YIELD TABLES

| Au | Model | age_0 | age_10 | age_20 | age_30 | age_40 | age_50 | age_60 | age_70 | age_80 | age_90 | age_100 | age_110 | age_120 | age_130 | age_140 | age_150 | age_160 | age_170 | age_180 | age_190 | age_200 | age_210 | age_220 | age_230 | age_240 | age_250 | age_260 | age_270 | age_280 | age_290 | age_300 | age_310 | age_320 | age_330 | age_340 | age_350 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | VDYP6 | 0 | 0 | 1 | 41 | 138 | 231 | 320 | 401 | 478 | 548 | 613 | 675 | 725 | 775 | 820 | 859 | 893 | 921 | 951 | 981 | 1,009 | 1,037 | 1,071 | 1,103 | 1,134 | 1,165 | 1,167 | 1,169 | 1,171 | 1,173 | 1,174 | 1,175 | 1,176 | 1,177 | 1,178 | 1,178 |
| 2 | VDYP6 | 0 | 0 | 0 | 1 | 42 | 114 | 182 | 244 | 301 | 354 | 403 | 449 | 487 | 524 | 557 | 587 | 612 | 633 | 655 | 677 | 698 | 718 | 741 | 765 | 787 | 809 | 813 | 817 | 820 | 823 | 826 | 829 | 831 | 834 | 836 | 838 |
| 3 | VDYP6 | 0 | 0 | 0 | 0 | 3 | 35 | 85 | 133 | 178 | 220 | 259 | 296 | 326 | 356 | 382 | 404 | 424 | 439 | 457 | 473 | 489 | 504 | 522 | 539 | 556 | 573 | 576 | 579 | 582 | 584 | 587 | 589 | 591 | 593 | 595 | 596 |
| 4 | VDYP6 | 0 | 0 | 7 | 163 | 320 | 454 | 568 | 666 | 751 | 824 | 888 | 944 | 993 | 1,040 | 1,082 | 1,120 | 1,154 | 1,184 | 1,211 | 1,237 | 1,260 | 1,281 | 1,300 | 1,318 | 1,334 | 1,349 | 1,360 | 1,369 | 1,378 | 1,386 | 1,393 | 1,399 | 1,404 | 1,409 | 1,413 | 1,417 |
| 5 | VDYP6 | 0 | 0 | 1 | 64 | 196 | 310 | 409 | 496 | 572 | 638 | 697 | 750 | 795 | 839 | 880 | 916 | 948 | 977 | 1,005 | 1,030 | 1,054 | 1,075 | 1,095 | 1,114 | 1,131 | 1,147 | 1,158 | 1,167 | 1,176 | 1,183 | 1,190 | 1,197 | 1,202 | 1,207 | 1,212 | 1,216 |
| 6 | VDYP6 | 0 | 0 | 0 | 3 | 43 | 127 | 203 | 270 | 331 | 385 | 434 | 478 | 517 | 554 | 588 | 619 | 648 | 673 | 697 | 720 | 742 | 762 | 781 | 798 | 815 | 830 | 840 | 850 | 858 | 866 | 873 | 880 | 886 | 892 | 898 | 902 |
| 7 | VDYP6 | 0 | 0 | 16 | 76 | 156 | 240 | 324 | 398 | 464 | 522 | 574 | 621 | 662 | 702 | 739 | 772 | 803 | 830 | 856 | 881 | 903 | 925 | 945 | 963 | 981 | 998 | 1,012 | 1,025 | 1,038 | 1,050 | 1,061 | 1,072 | 1,082 | 1,092 | 1,102 | 1,111 |
| 8 | VDYP6 | 0 | 1 | 41 | 130 | 216 | 285 | 340 | 368 | 393 | 414 | 434 | 452 | 467 | 482 | 495 | 507 | 518 | 527 | 536 | 545 | 553 | 560 | 568 | 575 | 581 | 587 | 591 | 595 | 598 | 601 | 604 | 607 | 609 | 611 | 614 | 616 |
| 10 | VDYP6 | 0 | 0 | 1 | 148 | 331 | 486 | 617 | 731 | 831 | 920 | 999 | 1,069 | 1,132 | 1,181 | 1,222 | 1,255 | 1,279 | 1,295 | 1,304 | 1,322 | 1,339 | 1,356 | 1,372 | 1,388 | 1,403 | 1,417 | 1,418 | 1,419 | 1,420 | 1,420 | 1,420 | 1,421 | 1,421 | 1,420 | 1,420 | 1,420 |
| 11 | VDYP6 | 0 | 0 | 0 | 38 | 138 | 234 | 324 | 404 | 478 | 547 | 610 | 669 | 717 | 765 | 809 | 847 | 880 | 908 | 938 | 966 | 994 | 1,020 | 1,052 | 1,082 | 1,112 | 1,141 | 1,145 | 1,148 | 1,152 | 1,154 | 1,157 | 1,159 | 1,161 | 1,163 | 1,165 | 1,166 |
| 12 | VDYP6 | 0 | 0 | 0 | 1 | 38 | 107 | 172 | 231 | 286 | 337 | 385 | 430 | 466 | 502 | 534 | 562 | 586 | 606 | 628 | 649 | 669 | 689 | 712 | 735 | 757 | 778 | 781 | 784 | 786 | 789 | 791 | 793 | 795 | 797 | 798 | 800 |
| 13 | VDYP6 | 0 | 0 | 0 | 0 | 4 | 42 | 92 | 140 | 185 | 227 | 267 | 304 | 334 | 364 | 390 | 413 | 432 | 448 | 465 | 482 | 498 | 513 | 532 | 550 | 568 | 585 | 587 | 589 | 591 | 593 | 594 | 596 | 598 | 599 | 600 | 601 |
| 14 | VDYP6 | 0 | 0 | 6 | 157 | 310 | 441 | 553 | 648 | 731 | 802 | 865 | 920 | 967 | 1,013 | 1,054 | 1,091 | 1,124 | 1,153 | 1,180 | 1,205 | 1,227 | 1,248 | 1,267 | 1,284 | 1,300 | 1,315 | 1,325 | 1,333 | 1,340 | 1,347 | 1,353 | 1,358 | 1,362 | 1,366 | 1,369 | 1,372 |
| 15 | VDYP6 | 0 | 0 | 0 | 60 | 186 | 296 | 392 | 475 | 548 | 612 | 669 | 720 | 764 | 807 | 846 | 881 | 912 | 939 | 965 | 990 | 1,012 | 1,033 | 1,053 | 1,071 | 1,088 | 1,104 | 1,113 | 1,121 | 1,129 | 1,136 | 1,142 | 1,147 | 1,152 | 1,157 | 1,161 | 1,164 |
| 16 | VDYP6 | 0 | 0 | 0 | 2 | 48 | 127 | 201 | 266 | 325 | 377 | 425 | 468 | 506 | 543 | 576 | 606 | 633 | 657 | 680 | 703 | 724 | 743 | 762 | 779 | 796 | 811 | 819 | 827 | 834 | 840 | 845 | 851 | 856 | 860 | 864 | 867 |
| 17 | VDYP6 | 0 | 0 | 9 | 46 | 120 | 204 | 281 | 349 | 409 | 462 | 509 | 552 | 588 | 624 | 657 | 686 | 712 | 736 | 759 | 780 | 799 | 818 | 835 | 851 | 866 | 880 | 891 | 902 | 912 | 922 | 931 | 939 | 947 | 955 | 962 | 969 |
| 18 | VDYP6 | 0 | 3 | 49 | 141 | 227 | 296 | 351 | 378 | 401 | 422 | 442 | 459 | 475 | 489 | 502 | 514 | 525 | 534 | 543 | 552 | 560 | 568 | 576 | 583 | 591 | 598 | 600 | 603 | 605 | 607 | 609 | 611 | 613 | 614 | 616 | 617 |
| 19 | VDYP7 | 0 | 0 | 41 | 117 | 195 | 267 | 331 | 387 | 435 | 476 | 509 | 534 | 552 | 561 | 563 | 558 | 548 | 536 | 522 | 508 | 493 | 477 | 461 | 445 | 430 | 415 | 400 | 386 | 372 | 358 | 345 | 335 | 327 | 319 | 311 | 304 |
| 20 | VDYP6 | 0 | 0 | 1 | 57 | 197 | 315 | 415 | 500 | 573 | 638 | 695 | 747 | 792 | 829 | 859 | 883 | 901 | 913 | 920 | 933 | 945 | 957 | 968 | 979 | 989 | 998 | 1,000 | 1,002 | 1,004 | 1,005 | 1,006 | 1,007 | 1,008 | 1,009 | 1,010 | 1,010 |
| 21 | VDYP6 | 0 | 0 | 0 | 58 | 157 | 253 | 342 | 422 | 498 | 567 | 631 | 691 | 740 | 789 | 833 | 872 | 905 | 934 | 964 | 994 | 1,022 | 1,049 | 1,082 | 1,114 | 1,145 | 1,175 | 1,178 | 1,181 | 1,184 | 1,186 | 1,188 | 1,189 | 1,191 | 1,192 | 1,193 | 1,194 |
| 22 | VDYP6 | 0 | 0 | 0 | 0 | 32 | 95 | 157 | 214 | 266 | 315 | 361 | 403 | 438 | 472 | 502 | 529 | 552 | 571 | 591 | 611 | 630 | 648 | 670 | 691 | 712 | 732 | 735 | 738 | 740 | 742 | 744 | 746 | 748 | 749 | 751 | 752 |
| 23 | VDYP6 | 0 | 0 | 0 | 0 | 4 | 41 | 90 | 136 | 180 | 221 | 259 | 295 | 324 | 353 | 378 | 400 | 419 | 434 | 451 | 467 | 483 | 498 | 515 | 533 | 550 | 566 | 569 | 571 | 573 | 575 | 577 | 578 | 580 | 581 | 583 | 584 |
| 24 | VDYP6 | 0 | 0 | 8 | 158 | 308 | 436 | 546 | 639 | 719 | 789 | 851 | 905 | 951 | 996 | 1,036 | 1,072 | 1,103 | 1,131 | 1,157 | 1,181 | 1,203 | 1,223 | 1,242 | 1,259 | 1,275 | 1,289 | 1,298 | 1,305 | 1,312 | 1,318 | 1,323 | 1,328 | 1,331 | 1,335 | 1,337 | 1,340 |
| 25 | VDYP6 | 0 | 0 | 0 | 57 | 180 | 290 | 387 | 471 | 545 | 611 | 670 | 723 | 769 | 813 | 852 | 887 | 917 | 944 | 969 | 993 | 1,015 | 1,036 | 1,055 | 1,073 | 1,090 | 1,106 | 1,114 | 1,121 | 1,128 | 1,134 | 1,139 | 1,144 | 1,148 | 1,152 | 1,155 | 1,158 |
| 26 | VDYP6 | 0 | 0 | 0 | 4 | 61 | 145 | 221 | 290 | 352 | 407 | 458 | 504 | 544 | 582 | 616 | 647 | 674 | 698 | 721 | 743 | 764 | 784 | 802 | 820 | 836 | 851 | 859 | 866 | 873 | 879 | 884 | 890 | 894 | 898 | 902 | 905 |
| 27 | VDYP6 | 0 | 0 | 9 | 43 | 117 | 226 | 326 | 411 | 485 | 550 | 607 | 657 | 701 | 742 | 778 | 810 | 838 | 862 | 883 | 904 | 923 | 940 | 956 | 971 | 985 | 998 | 1,009 | 1,019 | 1,029 | 1,038 | 1,047 | 1,055 | 1,063 | 1,070 | 1,077 | 1,083 |
| 28 | VDYP6 | 0 | 0 | 74 | 186 | 270 | 334 | 383 | 405 | 425 | 443 | 459 | 473 | 486 | 498 | 508 | 518 | 526 | 534 | 541 | 548 | 554 | 560 | 566 | 572 | 578 | 583 | 585 | 588 | 589 | 591 | 593 | 594 | 596 | 597 | 598 | 599 |
| 30 | VDYP6 | 0 | 0 | 0 | 41 | 169 | 280 | 374 | 453 | 521 | 581 | 635 | 682 | 724 | 758 | 786 | 808 | 824 | 836 | 842 | 853 | 864 | 875 | 885 | 894 | 903 | 912 | 914 | 917 | 919 | 921 | 922 | 924 | 926 | 927 | 928 | 929 |
| 32 | VDYP6 | 0 | 0 | 0 | 0 | 24 | 100 | 171 | 234 | 293 | 347 | 397 | 444 | 482 | 520 | 553 | 583 | 608 | 629 | 652 | 674 | 694 | 714 | 737 | 759 | 781 | 802 | 808 | 813 | 818 | 822 | 826 | 830 | 834 | 837 | 840 | 843 |
| 33 | VDYP6 | 0 | 0 | 0 | 0 | 1 | 16 | 50 | 93 | 132 | 169 | 202 | 234 | 261 | 285 | 308 | 327 | 343 | 357 | 371 | 385 | 398 | 410 | 424 | 439 | 452 | 465 | 469 | 472 | 474 | 477 | 479 | 481 | 483 | 485 | 487 | 488 |
| 34 | VDYP6 | 0 | 0 | 2 | 145 | 301 | 434 | 548 | 645 | 729 | 802 | 865 | 920 | 967 | 1,013 | 1,055 | 1,092 | 1,125 | 1,155 | 1,182 | 1,207 | 1,229 | 1,249 | 1,267 | 1,284 | 1,299 | 1,312 | 1,323 | 1,333 | 1,341 | 1,349 | 1,355 | 1,361 | 1,366 | 1,371 | 1,374 | 1,377 |
| 35 | VDYP6 | 0 | 0 | 1 | 78 | 213 | 331 | 434 | 523 | 601 | 670 | 730 | 784 | 831 | 876 | 917 | 954 | 987 | 1,017 | 1,044 | 1,070 | 1,094 | 1,116 | 1,136 | 1,155 | 1,172 | 1,188 | 1,198 | 1,207 | 1,216 | 1,223 | 1,229 | 1,235 | 1,240 | 1,245 | 1,249 | 1,252 |
| 36 | VDYP6 | 0 | 0 | 0 | 0 | 27 | 106 | 178 | 243 | 303 | 357 | 407 | 452 | 492 | 530 | 565 | 596 | 625 | 650 | 675 | 699 | 722 | 744 | 764 | 784 | 802 | 820 | 828 | 836 | 842 | 849 | 855 | 860 | 865 | 870 | 874 | 878 |
| 38 | VDYP6 | 0 | 0 | 38 | 119 | 210 | 296 | 368 | 403 | 433 | 460 | 484 | 505 | 523 | 541 | 558 | 573 | 586 | 599 | 611 | 622 | 632 | 641 | 650 | 658 | 666 | 673 | 680 | 686 | 692 | 698 | 703 | 708 | 713 | 718 | 722 | 726 |
| 42 | VDYP6 | 0 | 0 | 0 | 0 | 39 | 113 | 183 | 246 | 305 | 359 | 409 | 456 | 494 | 532 | 565 | 595 | 620 | 641 | 663 | 684 | 705 | 724 | 748 | 771 | 793 | 814 | 818 | 821 | 824 | 827 | 830 | 832 | 834 | 836 | 838 | 840 |

| Au | Model | age_0 | age_10 | age_20 | age_30 | age_40 | age_50 | age_60 | age_70 | age_80 | age_90 | age_100 | age_110 | age_120 | age_130 | age_140 | age_150 | age_160 | age_170 | age_180 | age_190 | age_200 | age_210 | age_220 | age_230 | age_240 | age_250 | age_260 | age_270 | age_280 | age_290 | age_300 | age_310 | age_320 | age_330 | age_340 | age_350 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 43 | VDYP6 | 0 | 0 | 0 | 0 | 3 | 36 | 85 | 132 | 176 | 217 | 255 | 291 | 321 | 349 | 375 | 397 | 415 | 431 | 448 | 464 | 480 | 494 | 512 | 529 | 546 | 562 | 565 | 567 | 569 | 571 | 573 | 575 | 576 | 578 | 579 | 580 |
| 44 | VDYP6 | 0 | 0 | 9 | 157 | 302 | 425 | 531 | 618 | 694 | 760 | 818 | 868 | 911 | 953 | 990 | 1,023 | 1,051 | 1,077 | 1,100 | 1,122 | 1,142 | 1,160 | 1,177 | 1,192 | 1,206 | 1,219 | 1,226 | 1,232 | 1,237 | 1,241 | 1,245 | 1,248 | 1,250 | 1,252 | 1,254 | 1,255 |
| 45 | VDYP6 | 0 | 0 | 0 | 77 | 208 | 324 | 424 | 510 | 585 | 651 | 710 | 762 | 808 | 851 | 890 | 925 | 955 | 982 | 1,007 | 1,031 | 1,052 | 1,073 | 1,091 | 1,109 | 1,125 | 1,140 | 1,148 | 1,156 | 1,163 | 1,169 | 1,175 | 1,180 | 1,184 | 1,188 | 1,191 | 1,194 |
| 46 | VDYP6 | 0 | 0 | 0 | 1 | 39 | 120 | 195 | 262 | 322 | 376 | 425 | 469 | 508 | 545 | 578 | 608 | 635 | 660 | 683 | 704 | 725 | 744 | 762 | 779 | 795 | 810 | 818 | 826 | 834 | 840 | 846 | 852 | 857 | 862 | 866 | 870 |
| 47 | VDYP6 | 0 | 0 | 23 | 97 | 236 | 360 | 468 | 563 | 645 | 717 | 780 | 835 | 882 | 927 | 967 | 1,002 | 1,033 | 1,060 | 1,085 | 1,109 | 1,131 | 1,152 | 1,171 | 1,189 | 1,205 | 1,221 | 1,234 | 1,245 | 1,256 | 1,267 | 1,277 | 1,287 | 1,296 | 1,304 | 1,313 | 1,321 |
| 48 | VDYP6 | 0 | 3 | 57 | 152 | 244 | 318 | 375 | 405 | 431 | 454 | 475 | 493 | 509 | 524 | 537 | 549 | 559 | 568 | 576 | 584 | 592 | 599 | 605 | 612 | 618 | 623 | 627 | 629 | 632 | 635 | 637 | 639 | 641 | 642 | 644 | 645 |
| 51 | VDYP6 | 0 | 0 | 0 | 14 | 93 | 177 | 256 | 327 | 393 | 454 | 510 | 563 | 607 | 649 | 686 | 718 | 745 | 768 | 790 | 813 | 835 | 856 | 881 | 906 | 930 | 954 | 957 | 960 | 963 | 965 | 967 | 970 | 971 | 973 | 975 | 976 |
| 52 | VDYP6 | 0 | 0 | 0 | 0 | 17 | 66 | 122 | 173 | 221 | 265 | 306 | 345 | 377 | 407 | 434 | 457 | 477 | 493 | 510 | 527 | 543 | 558 | 576 | 594 | 612 | 629 | 631 | 634 | 636 | 638 | 640 | 641 | 643 | 644 | 646 | 647 |
| 53 | VDYP6 | 0 | 0 | 0 | 0 | 3 | 36 | 86 | 134 | 179 | 219 | 257 | 293 | 323 | 351 | 376 | 397 | 416 | 431 | 447 | 463 | 478 | 492 | 509 | 525 | 542 | 557 | 560 | 564 | 566 | 569 | 572 | 574 | 576 | 578 | 580 | 582 |
| 54 | VDYP6 | 0 | 0 | 0 | 134 | 289 | 420 | 532 | 627 | 708 | 778 | 839 | 892 | 938 | 982 | 1,021 | 1,057 | 1,089 | 1,117 | 1,143 | 1,166 | 1,186 | 1,205 | 1,222 | 1,237 | 1,250 | 1,262 | 1,273 | 1,282 | 1,291 | 1,298 | 1,305 | 1,310 | 1,315 | 1,319 | 1,323 | 1,325 |
| 55 | VDYP6 | 0 | 0 | 1 | 35 | 175 | 296 | 401 | 494 | 576 | 649 | 714 | 771 | 823 | 870 | 913 | 950 | 983 | 1,011 | 1,036 | 1,060 | 1,083 | 1,104 | 1,123 | 1,141 | 1,157 | 1,173 | 1,184 | 1,194 | 1,203 | 1,211 | 1,219 | 1,226 | 1,232 | 1,238 | 1,243 | 1,248 |
| 56 | VDYP6 | 0 | 0 | 0 | 1 | 34 | 115 | 193 | 263 | 326 | 382 | 434 | 482 | 524 | 562 | 597 | 628 | 655 | 678 | 700 | 721 | 741 | 761 | 779 | 796 | 812 | 827 | 834 | 841 | 848 | 854 | 859 | 864 | 868 | 873 | 876 | 880 |
| 57 | VDYP6 | 0 | 0 | 6 | 31 | 124 | 238 | 340 | 429 | 507 | 575 | 635 | 688 | 734 | 777 | 815 | 849 | 879 | 905 | 929 | 952 | 973 | 992 | 1,010 | 1,026 | 1,042 | 1,056 | 1,067 | 1,078 | 1,088 | 1,097 | 1,106 | 1,114 | 1,121 | 1,128 | 1,135 | 1,142 |
| 58 | VDYP6 | 0 | 0 | 43 | 203 | 334 | 441 | 533 | 596 | 654 | 706 | 754 | 798 | 836 | 873 | 906 | 935 | 961 | 983 | 1,006 | 1,028 | 1,049 | 1,069 | 1,091 | 1,111 | 1,131 | 1,150 | 1,155 | 1,159 | 1,163 | 1,167 | 1,170 | 1,173 | 1,176 | 1,178 | 1,180 | 1,182 |
| 61 | VDYP6 | 0 | 0 | 0 | 0 | 0 | 9 | 41 | 80 | 117 | 153 | 186 | 217 | 243 | 267 | 289 | 308 | 324 | 337 | 351 | 365 | 378 | 390 | 404 | 419 | 433 | 446 | 449 | 451 | 454 | 456 | 458 | 460 | 462 | 464 | 465 | 467 |
| 62 | VDYP6 | 0 | 0 | 0 | 0 | 2 | 51 | 113 | 169 | 221 | 267 | 310 | 349 | 384 | 417 | 447 | 475 | 500 | 522 | 544 | 565 | 585 | 603 | 620 | 637 | 653 | 667 | 676 | 684 | 692 | 699 | 705 | 711 | 717 | 722 | 727 | 732 |
| 63 | VDYP6 | 0 | 0 | 0 | 0 | 0 | 11 | 46 | 84 | 120 | 155 | 187 | 218 | 244 | 268 | 289 | 307 | 323 | 335 | 349 | 362 | 375 | 387 | 402 | 416 | 430 | 443 | 445 | 447 | 448 | 449 | 450 | 452 | 453 | 454 | 455 | 456 |
| 64 | VDYP6 | 0 | 0 | 0 | 0 | 1 | 41 | 96 | 148 | 195 | 238 | 278 | 315 | 347 | 378 | 406 | 432 | 455 | 476 | 496 | 516 | 535 | 552 | 569 | 585 | 600 | 615 | 622 | 628 | 634 | 640 | 645 | 650 | 654 | 659 | 663 | 666 |
| 65 | VDYP6 | 0 | 0 | 0 | 0 | 0 | 11 | 46 | 85 | 123 | 158 | 191 | 222 | 248 | 272 | 294 | 313 | 328 | 341 | 355 | 369 | 382 | 394 | 408 | 423 | 437 | 451 | 452 | 454 | 456 | 458 | 459 | 460 | 462 | 463 | 464 | 465 |
| 66 | VDYP6 | 0 | 0 | 0 | 0 | 1 | 44 | 100 | 151 | 198 | 241 | 280 | 316 | 348 | 378 | 405 | 430 | 453 | 473 | 492 | 511 | 528 | 545 | 561 | 576 | 591 | 604 | 611 | 617 | 623 | 628 | 633 | 638 | 642 | 646 | 650 | 653 |
| 67 | VDYP6 | 0 | 0 | 0 | 0 | 0 | 7 | 38 | 80 | 119 | 155 | 189 | 222 | 248 | 274 | 296 | 315 | 332 | 345 | 360 | 374 | 387 | 400 | 415 | 430 | 444 | 458 | 461 | 463 | 466 | 468 | 470 | 473 | 474 | 476 | 478 | 480 |
| 68 | VDYP6 | 0 | 0 | 0 | 0 | 1 | 48 | 111 | 168 | 220 | 267 | 311 | 351 | 386 | 420 | 451 | 479 | 504 | 527 | 549 | 571 | 591 | 610 | 628 | 645 | 662 | 677 | 686 | 694 | 701 | 708 | 714 | 720 | 726 | 731 | 736 | 740 |
| 69 | VDYP6 | 0 | 0 | 0 | 0 | 0 | 8 | 39 | 77 | 113 | 147 | 179 | 210 | 235 | 258 | 279 | 297 | 313 | 325 | 339 | 352 | 365 | 377 | 391 | 405 | 418 | 431 | 433 | 436 | 438 | 440 | 442 | 443 | 445 | 446 | 448 | 449 |
| 70 | VDYP6 | 0 | 0 | 0 | 0 | 0 | 45 | 106 | 163 | 214 | 260 | 303 | 341 | 375 | 408 | 438 | 465 | 489 | 510 | 532 | 552 | 571 | 588 | 605 | 621 | 636 | 650 | 658 | 665 | 671 | 677 | 683 | 688 | 693 | 697 | 701 | 705 |
| 72 | VDYP6 | 0 | 0 | 0 | 0 | 0 | 39 | 95 | 150 | 201 | 248 | 291 | 332 | 367 | 400 | 430 | 457 | 481 | 502 | 523 | 543 | 563 | 581 | 599 | 616 | 632 | 648 | 654 | 659 | 664 | 668 | 672 | 676 | 680 | 683 | 686 | 689 |
| 101 | TIPSY | 0 | 0 | 3 | 45 | 126 | 222 | 313 | 402 | 486 | 560 | 628 | 693 | 752 | 805 | 853 | 896 | 934 | 968 | 998 | 1,025 | 1,050 | 1,075 | 1,101 | 1,126 | 1,149 | 1,170 | 1,189 | 1,207 | 1,223 | 1,239 | 1,240 | 1,240 | 1,240 | 1,240 | 1,240 | 1,240 |
| 102 | TIPSY | 0 | 0 | 5 | 67 | 175 | 294 | 401 | 510 | 611 | 697 | 776 | 854 | 926 | 989 | 1,043 | 1,092 | 1,135 | 1,173 | 1,207 | 1,238 | 1,266 | 1,294 | 1,324 | 1,352 | 1,378 | 1,403 | 1,425 | 1,445 | 1,464 | 1,480 | 1,483 | 1,483 | 1,483 | 1,483 | 1,483 | 1,483 |
| 103 | TIPSY | 0 | 0 | 0 | 1 | 11 | 32 | 69 | 106 | 147 | 184 | 221 | 256 | 287 | 314 | 338 | 360 | 381 | 400 | 419 | 436 | 451 | 466 | 481 | 496 | 509 | 521 | 533 | 543 | 553 | 562 | 565 | 565 | 565 | 565 | 565 | 565 |
| 104 | TIPSY | 0 | 0 | 1 | 56 | 196 | 341 | 473 | 590 | 701 | 799 | 889 | 973 | 1,051 | 1,120 | 1,181 | 1,236 | 1,286 | 1,331 | 1,371 | 1,407 | 1,440 | 1,470 | 1,499 | 1,526 | 1,550 | 1,572 | 1,592 | 1,611 | 1,627 | 1,642 | 1,655 | 1,655 | 1,655 | 1,655 | 1,655 | 1,655 |
| 105 | TIPSY | 0 | 0 | 2 | 45 | 155 | 280 | 397 | 504 | 603 | 692 | 773 | 848 | 916 | 978 | 1,034 | 1,085 | 1,132 | 1,173 | 1,210 | 1,244 | 1,275 | 1,303 | 1,330 | 1,355 | 1,378 | 1,399 | 1,418 | 1,436 | 1,452 | 1,466 | 1,476 | 1,476 | 1,476 | 1,476 | 1,476 | 1,476 |
| 106 | TIPSY | 0 | 0 | 1 | 29 | 121 | 231 | 339 | 437 | 526 | 610 | 687 | 755 | 816 | 873 | 927 | 978 | 1,023 | 1,063 | 1,098 | 1,129 | 1,158 | 1,184 | 1,211 | 1,235 | 1,257 | 1,278 | 1,296 | 1,313 | 1,328 | 1,342 | 1,351 | 1,351 | 1,351 | 1,351 | 1,351 | 1,351 |
| 107 | TIPSY | 0 | 0 | 9 | 95 | 235 | 377 | 515 | 644 | 760 | 866 | 961 | 1,045 | 1,118 | 1,179 | 1,234 | 1,281 | 1,323 | 1,358 | 1,387 | 1,411 | 1,429 | 1,445 | 1,459 | 1,469 | 1,479 | 1,487 | 1,495 | 1,501 | 1,506 | 1,510 | 1,511 | 1,511 | 1,511 | 1,511 | 1,511 | 1,511 |
| 108 | TIPSY | 0 | 19 | 79 | 134 | 187 | 231 | 267 | 284 | 166 | 155 | 170 | 187 | 201 | 215 | 229 | 240 | 251 | 259 | 267 | 274 | 281 | 287 | 295 | 302 | 308 | 314 | 319 | 324 | 329 | 333 | 333 | 333 | 333 | 333 | 333 | 333 |
| 111 | TIPSY | 0 | 0 | 2 | 33 | 103 | 187 | 272 | 351 | 425 | 495 | 559 | 617 | 671 | 720 | 763 | 803 | 839 | 872 | 901 | 927 | 950 | 974 | 998 | 1,021 | 1,042 | 1,061 | 1,079 | 1,096 | 1,112 | 1,126 | 1,127 | 1,127 | 1,127 | 1,127 | 1,127 | 1,127 |
| 112 | TIPSY | 0 | 0 | 1 | 24 | 88 | 169 | 250 | 324 | 397 | 464 | 524 | 578 | 630 | 677 | 720 | 759 | 794 | 826 | 855 | 880 | 902 | 924 | 947 | 968 | 988 | 1,006 | 1,023 | 1,040 | 1,055 | 1,069 | 1,071 | 1,071 | 1,071 | 1,071 | 1,071 | 1,071 |

| Au | Model | age_0 | age_10 | age_20 | age_30 | age_40 | age_50 | age_60 | age_70 | age_80 | age_90 | age_100 | age_110 | age_120 | age_130 | age_140 | age_150 | age_160 | age_170 | age_180 | age_190 | age_200 | age_210 | age_220 | age_230 | age_240 | age_250 | age_260 | age_270 | age_280 | age_290 | age_300 | age_310 | age_320 | age_330 | age_340 | age_350 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 113 | TIPSY | 0 | 0 | 2 | 33 | 123 | 224 | 326 | 414 | 500 | 582 | 656 | 721 | 779 | 833 | 885 | 933 | 975 | 1,012 | 1,046 | 1,075 | 1,101 | 1,127 | 1,153 | 1,178 | 1,200 | 1,221 | 1,240 | 1,258 | 1,274 | 1,289 | 1,293 | 1,293 | 1,293 | 1,293 | 1,293 | 1,293 |
| 114 | TIPSY | 0 | 0 | 1 | 45 | 178 | 317 | 447 | 560 | 665 | 762 | 850 | 930 | 1,004 | 1,072 | 1,134 | 1,189 | 1,239 | 1,283 | 1,322 | 1,359 | 1,391 | 1,421 | 1,449 | 1,475 | 1,499 | 1,521 | 1,541 | 1,559 | 1,576 | 1,591 | 1,603 | 1,603 | 1,603 | 1,603 | 1,603 | 1,603 |
| 115 | TIPSY | 0 | 0 | 1 | 40 | 154 | 278 | 394 | 498 | 594 | 684 | 765 | 839 | 907 | 970 | 1,027 | 1,078 | 1,124 | 1,165 | 1,203 | 1,236 | 1,267 | 1,295 | 1,322 | 1,347 | 1,370 | 1,391 | 1,410 | 1,427 | 1,443 | 1,457 | 1,467 | 1,467 | 1,467 | 1,467 | 1,467 | 1,467 |
| 116 | TIPSY | 0 | 0 | 1 | 28 | 118 | 227 | 333 | 430 | 518 | 601 | 676 | 743 | 805 | 863 | 916 | 965 | 1,008 | 1,047 | 1,082 | 1,114 | 1,143 | 1,170 | 1,195 | 1,219 | 1,242 | 1,262 | 1,281 | 1,298 | 1,313 | 1,327 | 1,336 | 1,336 | 1,336 | 1,336 | 1,336 | 1,336 |
| 117 | TIPSY | 0 | 0 | 5 | 84 | 216 | 352 | 479 | 607 | 716 | 818 | 914 | 999 | 1,070 | 1,133 | 1,178 | 1,221 | 1,259 | 1,292 | 1,322 | 1,347 | 1,367 | 1,385 | 1,401 | 1,415 | 1,430 | 1,442 | 1,453 | 1,461 | 1,469 | 1,475 | 1,475 | 1,475 | 1,475 | 1,475 | 1,475 | 1,475 |
| 118 | TIPSY | 0 | 19 | 82 | 137 | 188 | 231 | 266 | 284 | 158 | 144 | 158 | 174 | 189 | 203 | 214 | 225 | 235 | 243 | 251 | 257 | 263 | 269 | 277 | 283 | 290 | 295 | 301 | 306 | 310 | 314 | 314 | 314 | 314 | 314 | 314 | 314 |
| 120 | TIPSY | 0 | 0 | 5 | 60 | 148 | 238 | 323 | 406 | 486 | 558 | 621 | 679 | 733 | 781 | 824 | 862 | 896 | 925 | 951 | 976 | 999 | 1,020 | 1,041 | 1,058 | 1,076 | 1,091 | 1,107 | 1,121 | 1,132 | 1,141 | 1,141 | 1,141 | 1,141 | 1,141 | 1,141 | 1,141 |
| 121 | TIPSY | 0 | 0 | 1 | 14 | 61 | 129 | 197 | 263 | 327 | 382 | 430 | 480 | 528 | 571 | 611 | 646 | 679 | 705 | 728 | 748 | 765 | 784 | 804 | 825 | 845 | 865 | 883 | 900 | 917 | 930 | 930 | 930 | 930 | 930 | 930 | 930 |
| 122 | TIPSY | 0 | 0 | 0 | 10 | 50 | 114 | 181 | 246 | 310 | 362 | 408 | 456 | 503 | 545 | 584 | 619 | 650 | 677 | 698 | 717 | 736 | 754 | 773 | 791 | 812 | 831 | 849 | 866 | 882 | 897 | 899 | 899 | 899 | 899 | 899 | 899 |
| 124 | TIPSY | 0 | 0 | 2 | 65 | 221 | 372 | 513 | 633 | 751 | 855 | 945 | 1,033 | 1,115 | 1,192 | 1,257 | 1,310 | 1,359 | 1,406 | 1,450 | 1,487 | 1,518 | 1,548 | 1,578 | 1,605 | 1,630 | 1,654 | 1,676 | 1,696 | 1,710 | 1,724 | 1,736 | 1,736 | 1,736 | 1,736 | 1,736 | 1,736 |
| 125 | TIPSY | 0 | 0 | 1 | 36 | 136 | 253 | 365 | 467 | 559 | 645 | 723 | 795 | 859 | 918 | 974 | 1,024 | 1,068 | 1,109 | 1,145 | 1,178 | 1,208 | 1,235 | 1,262 | 1,286 | 1,309 | 1,330 | 1,349 | 1,366 | 1,382 | 1,395 | 1,405 | 1,405 | 1,405 | 1,405 | 1,405 | 1,405 |
| 126 | TIPSY | 0 | 0 | 0 | 2 | 19 | 58 | 113 | 176 | 235 | 290 | 339 | 384 | 428 | 469 | 504 | 536 | 565 | 593 | 618 | 641 | 664 | 683 | 704 | 722 | 739 | 755 | 770 | 784 | 795 | 807 | 814 | 814 | 814 | 814 | 814 | 814 |
| 128 | TIPSY | 0 | 13 | 66 | 112 | 160 | 199 | 234 | 250 | 156 | 152 | 169 | 184 | 198 | 211 | 225 | 237 | 248 | 256 | 264 | 271 | 277 | 284 | 291 | 298 | 304 | 310 | 315 | 320 | 324 | 328 | 328 | 328 | 328 | 328 | 328 | 328 |
| 131 | TIPSY | 0 | 0 | 24 | 147 | 304 | 460 | 617 | 752 | 886 | 1,002 | 1,111 | 1,203 | 1,284 | 1,363 | 1,434 | 1,492 | 1,543 | 1,592 | 1,634 | 1,672 | 1,706 | 1,742 | 1,780 | 1,816 | 1,849 | 1,878 | 1,905 | 1,930 | 1,938 | 1,945 | 1,946 | 1,946 | 1,946 | 1,946 | 1,946 | 1,946 |
| 132 | TIPSY | 0 | 0 | 0 | 4 | 31 | 79 | 132 | 184 | 238 | 288 | 331 | 369 | 404 | 440 | 474 | 504 | 532 | 556 | 578 | 599 | 616 | 635 | 651 | 667 | 681 | 694 | 707 | 719 | 730 | 740 | 742 | 742 | 742 | 742 | 742 | 742 |
| 135 | TIPSY | 0 | 0 | 2 | 29 | 111 | 225 | 333 | 433 | 525 | 606 | 679 | 748 | 812 | 868 | 920 | 967 | 1,011 | 1,051 | 1,087 | 1,122 | 1,152 | 1,179 | 1,205 | 1,229 | 1,251 | 1,272 | 1,291 | 1,308 | 1,324 | 1,338 | 1,347 | 1,347 | 1,347 | 1,347 | 1,347 | 1,347 |
| 141 | TIPSY | 0 | 0 | 3 | 37 | 113 | 200 | 289 | 371 | 447 | 520 | 586 | 647 | 703 | 753 | 798 | 838 | 874 | 908 | 937 | 964 | 988 | 1,013 | 1,038 | 1,062 | 1,085 | 1,105 | 1,124 | 1,141 | 1,158 | 1,173 | 1,173 | 1,173 | 1,173 | 1,173 | 1,173 | 1,173 |
| 144 | TIPSY | 0 | 0 | 1 | 40 | 171 | 309 | 438 | 551 | 653 | 749 | 838 | 916 | 988 | 1,055 | 1,116 | 1,173 | 1,224 | 1,268 | 1,306 | 1,341 | 1,374 | 1,404 | 1,433 | 1,459 | 1,483 | 1,505 | 1,525 | 1,542 | 1,558 | 1,573 | 1,586 | 1,586 | 1,586 | 1,586 | 1,586 | 1,586 |
| 145 | TIPSY | 0 | 0 | 1 | 30 | 132 | 251 | 361 | 462 | 552 | 637 | 716 | 788 | 852 | 911 | 967 | 1,017 | 1,063 | 1,103 | 1,139 | 1,172 | 1,202 | 1,230 | 1,256 | 1,281 | 1,304 | 1,324 | 1,343 | 1,360 | 1,376 | 1,390 | 1,400 | 1,400 | 1,400 | 1,400 | 1,400 | 1,400 |
| 146 | TIPSY | 0 | 0 | 6 | 80 | 201 | 338 | 465 | 584 | 692 | 787 | 874 | 953 | 1,026 | 1,092 | 1,148 | 1,198 | 1,244 | 1,287 | 1,327 | 1,363 | 1,395 | 1,425 | 1,454 | 1,480 | 1,503 | 1,526 | 1,539 | 1,552 | 1,564 | 1,574 | 1,580 | 1,580 | 1,580 | 1,580 | 1,580 | 1,580 |
| 147 | TIPSY | 0 | 0 | 10 | 107 | 259 | 407 | 556 | 686 | 810 | 922 | 1,019 | 1,103 | 1,178 | 1,245 | 1,301 | 1,350 | 1,393 | 1,430 | 1,458 | 1,478 | 1,492 | 1,505 | 1,516 | 1,526 | 1,534 | 1,538 | 1,542 | 1,545 | 1,549 | 1,552 | 1,552 | 1,552 | 1,552 | 1,552 | 1,552 | 1,552 |
| 148 | TIPSY | 0 | 13 | 65 | 109 | 150 | 186 | 216 | 232 | 139 | 131 | 146 | 162 | 177 | 189 | 199 | 209 | 217 | 225 | 232 | 239 | 245 | 252 | 259 | 266 | 272 | 278 | 282 | 287 | 291 | 294 | 294 | 294 | 294 | 294 | 294 | 294 |
| 151 | TIPSY | 0 | 0 | 2 | 37 | 124 | 217 | 314 | 393 | 479 | 560 | 632 | 694 | 744 | 794 | 847 | 895 | 938 | 971 | 1,002 | 1,029 | 1,053 | 1,078 | 1,104 | 1,129 | 1,152 | 1,174 | 1,192 | 1,208 | 1,224 | 1,239 | 1,240 | 1,240 | 1,240 | 1,240 | 1,240 | 1,240 |
| 154 | TIPSY | 0 | 0 | 2 | 62 | 215 | 364 | 504 | 621 | 736 | 841 | 929 | 1,016 | 1,096 | 1,172 | 1,238 | 1,292 | 1,340 | 1,386 | 1,428 | 1,466 | 1,499 | 1,528 | 1,557 | 1,584 | 1,609 | 1,632 | 1,654 | 1,673 | 1,689 | 1,705 | 1,716 | 1,716 | 1,716 | 1,716 | 1,716 | 1,716 |
| 155 | TIPSY | 0 | 0 | 3 | 51 | 165 | 296 | 418 | 532 | 632 | 723 | 807 | 887 | 953 | 1,014 | 1,074 | 1,127 | 1,174 | 1,217 | 1,257 | 1,291 | 1,321 | 1,349 | 1,376 | 1,402 | 1,426 | 1,448 | 1,468 | 1,486 | 1,501 | 1,516 | 1,525 | 1,525 | 1,525 | 1,525 | 1,525 | 1,525 |
| 158 | TIPSY | 0 | 28 | 103 | 183 | 256 | 315 | 362 | 385 | 240 | 228 | 248 | 270 | 289 | 307 | 324 | 340 | 353 | 363 | 373 | 382 | 390 | 398 | 407 | 416 | 424 | 432 | 440 | 446 | 452 | 457 | 457 | 457 | 457 | 457 | 457 | 457 |
| 162 | TIPSY | 0 | 0 | 1 | 16 | 74 | 165 | 261 | 350 | 430 | 504 | 572 | 632 | 689 | 738 | 784 | 827 | 869 | 905 | 939 | 969 | 997 | 1,023 | 1,047 | 1,069 | 1,089 | 1,109 | 1,127 | 1,144 | 1,160 | 1,174 | 1,183 | 1,183 | 1,183 | 1,183 | 1,183 | 1,183 |
| 163 | TIPSY | 0 | 0 | 1 | 14 | 59 | 121 | 188 | 250 | 309 | 368 | 422 | 469 | 512 | 551 | 587 | 621 | 653 | 682 | 709 | 732 | 752 | 772 | 793 | 811 | 828 | 844 | 858 | 871 | 884 | 895 | 899 | 899 | 899 | 899 | 899 | 899 |
| 164 | TIPSY | 0 | 0 | 0 | 13 | 70 | 158 | 248 | 333 | 411 | 481 | 544 | 605 | 662 | 714 | 760 | 801 | 837 | 872 | 904 | 935 | 963 | 989 | 1,015 | 1,038 | 1,059 | 1,078 | 1,095 | 1,111 | 1,125 | 1,139 | 1,147 | 1,147 | 1,147 | 1,147 | 1,147 | 1,147 |
| 167 | TIPSY | 0 | 0 | 0 | 0 | 1 | 7 | 20 | 34 | 55 | 79 | 101 | 122 | 143 | 162 | 179 | 195 | 210 | 224 | 237 | 250 | 261 | 272 | 283 | 294 | 304 | 314 | 321 | 327 | 333 | 339 | 341 | 341 | 341 | 341 | 341 | 341 |
| 169 | TIPSY | 0 | 0 | 0 | 0 | 1 | 7 | 20 | 34 | 55 | 79 | 101 | 122 | 143 | 162 | 179 | 195 | 210 | 224 | 237 | 250 | 261 | 272 | 283 | 294 | 304 | 314 | 321 | 327 | 333 | 339 | 341 | 341 | 341 | 341 | 341 | 341 |
| 201 | TIPSY | 0 | 0 | 2 | 26 | 84 | 160 | 235 | 307 | 374 | 438 | 495 | 546 | 593 | 639 | 679 | 713 | 745 | 774 | 801 | 826 | 848 | 870 | 892 | 911 | 929 | 945 | 960 | 974 | 987 | 1,001 | 1,001 | 1,001 | 1,001 | 1,001 | 1,001 | 1,001 |
| 202 | TIPSY | 0 | 0 | 3 | 45 | 128 | 225 | 319 | 407 | 491 | 566 | 636 | 700 | 757 | 809 | 857 | 900 | 938 | 973 | 1,003 | 1,030 | 1,054 | 1,079 | 1,104 | 1,127 | 1,148 | 1,168 | 1,187 | 1,205 | 1,221 | 1,236 | 1,238 | 1,238 | 1,238 | 1,238 | 1,238 | 1,238 |
| 203 | TIPSY | 0 | 0 | 2 | 37 | 123 | 222 | 319 | 409 | 493 | 571 | 642 | 707 | 766 | 819 | 868 | 912 | 951 | 987 | 1,019 | 1,047 | 1,073 | 1,098 | 1,123 | 1,147 | 1,169 | 1,190 | 1,208 | 1,225 | 1,241 | 1,256 | 1,260 | 1,260 | 1,260 | 1,260 | 1,260 | 1,260 |
| 204 | TIPSY | 0 | 0 | 2 | 47 | 162 | 291 | 414 | 524 | 626 | 719 | 801 | 878 | 948 | 1,013 | 1,071 | 1,123 | 1,169 | 1,211 | 1,248 | 1,283 | 1,314 | 1,343 | 1,371 | 1,397 | 1,421 | 1,443 | 1,462 | 1,480 | 1,496 | 1,510 | 1,522 | 1,522 | 1,522 | 1,522 | 1,522 | 1,522 |

| Au | Model | age_0 | age_10 | age_20 | age_30 | age_40 | age_50 | age_60 | age_70 | age_80 | age_90 | age_100 | age_110 | age_120 | age_130 | age_140 | age_150 | age_160 | age_170 | age_180 | age_190 | age_200 | age_210 | age_220 | age_230 | age_240 | age_250 | age_260 | age_270 | age_280 | age_290 | age_300 | age_310 | age_320 | age_330 | age_340 | age_350 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 205 | TIPSY | 0 | 0 | 2 | 41 | 144 | 265 | 380 | 484 | 580 | 666 | 746 | 818 | 884 | 945 | 1,000 | 1,050 | 1,095 | 1,136 | 1,173 | 1,206 | 1,236 | 1,264 | 1,291 | 1,315 | 1,338 | 1,359 | 1,378 | 1,395 | 1,411 | 1,425 | 1,434 | 1,434 | 1,434 | 1,434 | 1,434 | 1,434 |
| 206 | TIPSY | 0 | 0 | 2 | 39 | 133 | 241 | 348 | 446 | 537 | 619 | 695 | 765 | 828 | 886 | 938 | 985 | 1,028 | 1,067 | 1,102 | 1,133 | 1,162 | 1,189 | 1,214 | 1,238 | 1,260 | 1,280 | 1,298 | 1,315 | 1,330 | 1,343 | 1,352 | 1,352 | 1,352 | 1,352 | 1,352 | 1,352 |
| 207 | TIPSY | 0 | 0 | 6 | 59 | 153 | 258 | 365 | 464 | 557 | 643 | 720 | 789 | 852 | 908 | 957 | 1,000 | 1,037 | 1,070 | 1,099 | 1,123 | 1,144 | 1,164 | 1,182 | 1,197 | 1,212 | 1,225 | 1,236 | 1,245 | 1,253 | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 |
| 208 | TIPSY | 0 | 21 | 87 | 145 | 199 | 244 | 281 | 298 | 163 | 146 | 161 | 176 | 190 | 203 | 215 | 225 | 234 | 242 | 250 | 256 | 262 | 268 | 275 | 281 | 286 | 291 | 296 | 301 | 306 | 310 | 310 | 310 | 310 | 310 | 310 | 310 |
| 210 | TIPSY | 0 | 0 | 43 | 185 | 342 | 502 | 653 | 787 | 902 | 1,006 | 1,094 | 1,170 | 1,239 | 1,303 | 1,357 | 1,402 | 1,442 | 1,479 | 1,497 | 1,513 | 1,528 | 1,541 | 1,553 | 1,565 | 1,575 | 1,586 | 1,595 | 1,605 | 1,614 | 1,622 | 1,622 | 1,622 | 1,622 | 1,622 | 1,622 | 1,622 |
| 211 | TIPSY | 0 | 0 | 3 | 42 | 122 | 214 | 303 | 388 | 468 | 541 | 607 | 668 | 724 | 776 | 822 | 863 | 899 | 931 | 960 | 986 | 1,009 | 1,033 | 1,058 | 1,082 | 1,103 | 1,123 | 1,141 | 1,158 | 1,174 | 1,188 | 1,188 | 1,188 | 1,188 | 1,188 | 1,188 | 1,188 |
| 212 | TIPSY | 0 | 0 | 1 | 27 | 95 | 178 | 260 | 337 | 410 | 477 | 538 | 594 | 647 | 694 | 737 | 776 | 810 | 841 | 869 | 894 | 916 | 938 | 962 | 983 | 1,004 | 1,022 | 1,040 | 1,056 | 1,071 | 1,085 | 1,087 | 1,087 | 1,087 | 1,087 | 1,087 | 1,087 |
| 213 | TIPSY | 0 | 0 | 1 | 25 | 94 | 179 | 264 | 343 | 416 | 485 | 548 | 606 | 659 | 707 | 751 | 791 | 826 | 858 | 887 | 913 | 936 | 959 | 982 | 1,004 | 1,024 | 1,043 | 1,060 | 1,076 | 1,091 | 1,104 | 1,108 | 1,108 | 1,108 | 1,108 | 1,108 | 1,108 |
| 214 | TIPSY | 0 | 0 | 1 | 46 | 170 | 300 | 419 | 524 | 621 | 711 | 792 | 865 | 934 | 996 | 1,053 | 1,103 | 1,148 | 1,188 | 1,224 | 1,257 | 1,287 | 1,314 | 1,340 | 1,363 | 1,385 | 1,405 | 1,423 | 1,440 | 1,455 | 1,468 | 1,479 | 1,479 | 1,479 | 1,479 | 1,479 | 1,479 |
| 215 | TIPSY | 0 | 0 | 1 | 38 | 140 | 253 | 359 | 455 | 543 | 624 | 698 | 765 | 828 | 884 | 935 | 982 | 1,023 | 1,060 | 1,094 | 1,124 | 1,152 | 1,177 | 1,202 | 1,225 | 1,245 | 1,264 | 1,282 | 1,298 | 1,312 | 1,325 | 1,333 | 1,333 | 1,333 | 1,333 | 1,333 | 1,333 |
| 216 | TIPSY | 0 | 0 | 1 | 27 | 107 | 201 | 294 | 380 | 459 | 532 | 599 | 660 | 717 | 768 | 815 | 857 | 895 | 929 | 960 | 989 | 1,015 | 1,038 | 1,062 | 1,083 | 1,102 | 1,120 | 1,137 | 1,152 | 1,165 | 1,178 | 1,186 | 1,186 | 1,186 | 1,186 | 1,186 | 1,186 |
| 217 | TIPSY | 0 | 0 | 1 | 33 | 114 | 210 | 310 | 403 | 491 | 574 | 651 | 722 | 785 | 843 | 897 | 945 | 989 | 1,027 | 1,060 | 1,090 | 1,117 | 1,142 | 1,164 | 1,184 | 1,201 | 1,217 | 1,231 | 1,243 | 1,253 | 1,263 | 1,264 | 1,264 | 1,264 | 1,264 | 1,264 | 1,264 |
| 218 | TIPSY | 0 | 22 | 89 | 150 | 206 | 254 | 291 | 308 | 168 | 152 | 166 | 182 | 197 | 210 | 222 | 233 | 242 | 251 | 258 | 265 | 271 | 277 | 284 | 291 | 297 | 302 | 307 | 312 | 317 | 321 | 321 | 321 | 321 | 321 | 321 | 321 |
| 219 | VDYP7 | 0 | 0 | 41 | 117 | 195 | 267 | 331 | 387 | 435 | 476 | 509 | 534 | 552 | 561 | 563 | 558 | 548 | 536 | 522 | 508 | 493 | 477 | 461 | 445 | 430 | 415 | 400 | 386 | 372 | 358 | 345 | 335 | 327 | 319 | 311 | 304 |
| 220 | TIPSY | 0 | 0 | 14 | 88 | 189 | 290 | 387 | 481 | 564 | 638 | 707 | 768 | 820 | 865 | 906 | 942 | 975 | 1,005 | 1,032 | 1,056 | 1,076 | 1,096 | 1,114 | 1,132 | 1,148 | 1,159 | 1,170 | 1,179 | 1,188 | 1,196 | 1,196 | 1,196 | 1,196 | 1,196 | 1,196 | 1,196 |
| 221 | TIPSY | 0 | 0 | 8 | 55 | 141 | 240 | 336 | 426 | 510 | 584 | 656 | 721 | 779 | 831 | 880 | 923 | 961 | 994 | 1,022 | 1,048 | 1,070 | 1,093 | 1,118 | 1,141 | 1,162 | 1,182 | 1,200 | 1,215 | 1,229 | 1,241 | 1,241 | 1,241 | 1,241 | 1,241 | 1,241 | 1,241 |
| 222 | TIPSY | 0 | 0 | 1 | 16 | 68 | 139 | 210 | 279 | 344 | 402 | 454 | 504 | 552 | 595 | 635 | 670 | 702 | 730 | 754 | 776 | 796 | 815 | 836 | 855 | 874 | 892 | 909 | 924 | 939 | 952 | 954 | 954 | 954 | 954 | 954 | 954 |
| 223 | TIPSY | 0 | 0 | 1 | 18 | 75 | 150 | 225 | 297 | 365 | 427 | 483 | 536 | 585 | 630 | 671 | 708 | 741 | 771 | 797 | 820 | 842 | 862 | 884 | 904 | 923 | 941 | 957 | 972 | 986 | 999 | 1,004 | 1,004 | 1,004 | 1,004 | 1,004 | 1,004 |
| 224 | TIPSY | 0 | 0 | 1 | 28 | 91 | 154 | 212 | 262 | 307 | 348 | 385 | 419 | 448 | 476 | 501 | 523 | 542 | 559 | 574 | 588 | 601 | 612 | 622 | 632 | 640 | 648 | 655 | 661 | 666 | 672 | 675 | 675 | 675 | 675 | 675 | 675 |
| 225 | TIPSY | 0 | 0 | 0 | 14 | 54 | 105 | 152 | 195 | 234 | 268 | 299 | 328 | 355 | 379 | 400 | 419 | 437 | 453 | 467 | 480 | 491 | 502 | 512 | 522 | 530 | 538 | 545 | 551 | 557 | 562 | 566 | 566 | 566 | 566 | 566 | 566 |
| 226 | TIPSY | 0 | 0 | 0 | 6 | 31 | 66 | 104 | 140 | 173 | 203 | 231 | 255 | 278 | 298 | 317 | 334 | 349 | 363 | 376 | 387 | 398 | 408 | 417 | 426 | 434 | 441 | 448 | 454 | 460 | 465 | 468 | 468 | 468 | 468 | 468 | 468 |
| 227 | TIPSY | 0 | 0 | 2 | 26 | 88 | 175 | 269 | 358 | 444 | 523 | 597 | 665 | 727 | 784 | 836 | 883 | 925 | 963 | 997 | 1,028 | 1,056 | 1,080 | 1,104 | 1,125 | 1,146 | 1,162 | 1,177 | 1,189 | 1,202 | 1,213 | 1,216 | 1,216 | 1,216 | 1,216 | 1,216 | 1,216 |
| 228 | TIPSY | 0 | 31 | 107 | 173 | 233 | 283 | 320 | 335 | 162 | 135 | 147 | 162 | 175 | 188 | 199 | 209 | 217 | 224 | 230 | 236 | 241 | 248 | 254 | 261 | 267 | 272 | 277 | 282 | 286 | 290 | 290 | 290 | 290 | 290 | 290 | 290 |
| 230 | TIPSY | 0 | 0 | 5 | 36 | 83 | 129 | 173 | 215 | 253 | 288 | 319 | 347 | 371 | 393 | 413 | 430 | 446 | 459 | 472 | 482 | 492 | 501 | 510 | 517 | 524 | 531 | 536 | 541 | 546 | 550 | 550 | 550 | 550 | 550 | 550 | 550 |
| 232 | TIPSY | 0 | 0 | 0 | 8 | 33 | 69 | 113 | 155 | 194 | 228 | 259 | 289 | 317 | 345 | 371 | 396 | 417 | 436 | 454 | 470 | 484 | 498 | 512 | 525 | 537 | 549 | 560 | 570 | 580 | 589 | 589 | 589 | 589 | 589 | 589 | 589 |
| 233 | TIPSY | 0 | 0 | 0 | 1 | 6 | 19 | 37 | 57 | 78 | 100 | 121 | 140 | 157 | 174 | 190 | 203 | 216 | 228 | 238 | 248 | 256 | 266 | 274 | 282 | 290 | 298 | 304 | 312 | 317 | 323 | 323 | 323 | 323 | 323 | 323 | 323 |
| 234 | TIPSY | 0 | 0 | 15 | 103 | 218 | 330 | 447 | 550 | 644 | 734 | 811 | 878 | 936 | 988 | 1,037 | 1,081 | 1,120 | 1,155 | 1,185 | 1,210 | 1,232 | 1,254 | 1,274 | 1,294 | 1,312 | 1,327 | 1,340 | 1,354 | 1,365 | 1,376 | 1,376 | 1,376 | 1,376 | 1,376 | 1,376 | 1,376 |
| 235 | TIPSY | 0 | 0 | 6 | 62 | 154 | 244 | 332 | 421 | 500 | 571 | 638 | 699 | 754 | 801 | 843 | 879 | 913 | 944 | 972 | 998 | 1,022 | 1,044 | 1,064 | 1,081 | 1,097 | 1,112 | 1,125 | 1,137 | 1,148 | 1,158 | 1,158 | 1,158 | 1,158 | 1,158 | 1,158 | 1,158 |
| 236 | TIPSY | 0 | 0 | 0 | 5 | 26 | 57 | 96 | 134 | 169 | 202 | 232 | 259 | 284 | 308 | 330 | 352 | 372 | 390 | 407 | 422 | 436 | 449 | 462 | 474 | 485 | 495 | 505 | 514 | 522 | 530 | 530 | 530 | 530 | 530 | 530 | 530 |
| 238 | TIPSY | 0 | 0 | 5 | 47 | 116 | 186 | 264 | 339 | 401 | 463 | 518 | 568 | 612 | 652 | 688 | 722 | 752 | 780 | 805 | 828 | 848 | 865 | 881 | 897 | 912 | 926 | 939 | 951 | 962 | 972 | 972 | 972 | 972 | 972 | 972 | 972 |
| 242 | TIPSY | 0 | 0 | 0 | 11 | 41 | 83 | 129 | 172 | 212 | 248 | 282 | 315 | 345 | 374 | 401 | 425 | 447 | 467 | 485 | 502 | 517 | 531 | 546 | 559 | 571 | 582 | 593 | 602 | 611 | 619 | 619 | 619 | 619 | 619 | 619 | 619 |
| 243 | TIPSY | 0 | 0 | 0 | 1 | 11 | 28 | 50 | 75 | 100 | 124 | 147 | 167 | 186 | 203 | 219 | 234 | 248 | 260 | 272 | 283 | 294 | 304 | 314 | 322 | 331 | 339 | 347 | 354 | 360 | 366 | 366 | 366 | 366 | 366 | 366 | 366 |
| 244 | TIPSY | 0 | 0 | 26 | 131 | 255 | 382 | 505 | 616 | 713 | 802 | 879 | 947 | 1,006 | 1,058 | 1,106 | 1,147 | 1,184 | 1,217 | 1,246 | 1,271 | 1,293 | 1,314 | 1,334 | 1,352 | 1,365 | 1,376 | 1,387 | 1,396 | 1,404 | 1,412 | 1,412 | 1,412 | 1,412 | 1,412 | 1,412 | 1,412 |
| 245 | TIPSY | 0 | 0 | 6 | 60 | 147 | 231 | 316 | 399 | 473 | 541 | 605 | 661 | 712 | 756 | 795 | 830 | 862 | 891 | 918 | 942 | 965 | 984 | 1,002 | 1,018 | 1,033 | 1,046 | 1,059 | 1,070 | 1,081 | 1,091 | 1,091 | 1,091 | 1,091 | 1,091 | 1,091 | 1,091 |
| 246 | TIPSY | 0 | 0 | 0 | 8 | 32 | 67 | 106 | 145 | 181 | 214 | 245 | 274 | 301 | 325 | 348 | 370 | 390 | 408 | 425 | 440 | 455 | 468 | 481 | 492 | 503 | 513 | 523 | 531 | 539 | 547 | 547 | 547 | 547 | 547 | 547 | 547 |

| Au | Model | age_0 | age_10 | age_20 | age_30 | age_40 | age_50 | age_60 | age_70 | age_80 | age_90 | age_100 | age_110 | age_120 | age_130 | age_140 | age_150 | age_160 | age_170 | age_180 | age_190 | age_200 | age_210 | age_220 | age_230 | age_240 | age_250 | age_260 | age_270 | age_280 | age_290 | age_300 | age_310 | age_320 | age_330 | age_340 | age_350 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 247 | TIPSY | 0 | 0 | 5 | 52 | 135 | 218 | 295 | 374 | 449 | 511 | 570 | 627 | 677 | 721 | 760 | 793 | 823 | 851 | 877 | 899 | 920 | 940 | 960 | 978 | 995 | 1,010 | 1,021 | 1,031 | 1,039 | 1,048 | 1,048 | 1,048 | 1,048 | 1,048 | 1,048 | 1,048 |
| 248 | TIPSY | 0 | 0 | 13 | 80 | 171 | 267 | 357 | 443 | 523 | 593 | 654 | 711 | 763 | 809 | 849 | 884 | 916 | 944 | 970 | 992 | 1,012 | 1,032 | 1,051 | 1,069 | 1,083 | 1,098 | 1,110 | 1,120 | 1,129 | 1,137 | 1,137 | 1,137 | 1,137 | 1,137 | 1,137 | 1,137 |
| 251 | TIPSY | 0 | 0 | 1 | 22 | 58 | 97 | 131 | 165 | 200 | 230 | 256 | 280 | 303 | 324 | 342 | 359 | 372 | 385 | 396 | 406 | 415 | 425 | 433 | 441 | 448 | 454 | 460 | 466 | 472 | 476 | 476 | 476 | 476 | 476 | 476 | 476 |
| 252 | TIPSY | 0 | 0 | 0 | 4 | 15 | 32 | 53 | 73 | 91 | 108 | 122 | 136 | 149 | 162 | 174 | 185 | 195 | 204 | 212 | 220 | 226 | 234 | 240 | 246 | 251 | 257 | 261 | 265 | 270 | 273 | 273 | 273 | 273 | 273 | 273 | 273 |
| 253 | TIPSY | 0 | 0 | 0 | 1 | 6 | 16 | 28 | 42 | 55 | 68 | 80 | 92 | 101 | 111 | 119 | 127 | 134 | 141 | 147 | 153 | 159 | 164 | 169 | 174 | 178 | 183 | 186 | 190 | 193 | 196 | 196 | 196 | 196 | 196 | 196 | 196 |
| 254 | TIPSY | 0 | 0 | 6 | 45 | 99 | 150 | 204 | 251 | 293 | 333 | 368 | 399 | 425 | 448 | 468 | 487 | 505 | 520 | 534 | 545 | 554 | 563 | 572 | 580 | 587 | 593 | 599 | 605 | 610 | 614 | 614 | 614 | 614 | 614 | 614 | 614 |
| 255 | TIPSY | 0 | 0 | 1 | 20 | 54 | 92 | 125 | 157 | 189 | 219 | 244 | 268 | 290 | 310 | 328 | 344 | 357 | 369 | 381 | 391 | 400 | 408 | 416 | 424 | 431 | 438 | 444 | 449 | 454 | 457 | 457 | 457 | 457 | 457 | 457 | 457 |
| 256 | TIPSY | 0 | 0 | 0 | 4 | 17 | 36 | 57 | 77 | 97 | 114 | 131 | 146 | 160 | 172 | 184 | 196 | 206 | 215 | 224 | 232 | 239 | 246 | 252 | 259 | 264 | 269 | 274 | 278 | 283 | 286 | 286 | 286 | 286 | 286 | 286 | 286 |
| 257 | TIPSY | 0 | 0 | 0 | 11 | 35 | 65 | 93 | 120 | 146 | 169 | 191 | 211 | 230 | 248 | 263 | 277 | 290 | 301 | 311 | 321 | 329 | 337 | 345 | 352 | 359 | 364 | 370 | 375 | 380 | 385 | 385 | 385 | 385 | 385 | 385 | 385 |
| 258 | TIPSY | 0 | 0 | 8 | 51 | 105 | 157 | 210 | 257 | 299 | 339 | 374 | 403 | 428 | 450 | 472 | 491 | 509 | 524 | 536 | 546 | 555 | 564 | 573 | 581 | 589 | 596 | 601 | 606 | 611 | 614 | 614 | 614 | 614 | 614 | 614 | 614 |
| 261 | TIPSY | 0 | 0 | 2 | 43 | 132 | 234 | 332 | 424 | 510 | 589 | 661 | 728 | 788 | 842 | 891 | 936 | 976 | 1,012 | 1,044 | 1,073 | 1,098 | 1,123 | 1,149 | 1,173 | 1,196 | 1,216 | 1,235 | 1,252 | 1,268 | 1,282 | 1,287 | 1,287 | 1,287 | 1,287 | 1,287 | 1,287 |
| 262 | TIPSY | 0 | 0 | 1 | 32 | 116 | 214 | 311 | 402 | 486 | 564 | 635 | 701 | 760 | 815 | 864 | 909 | 951 | 988 | 1,022 | 1,052 | 1,080 | 1,105 | 1,129 | 1,152 | 1,172 | 1,191 | 1,209 | 1,225 | 1,239 | 1,253 | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 | 1,261 |
| 263 | TIPSY | 0 | 0 | 1 | 27 | 97 | 183 | 268 | 347 | 421 | 491 | 555 | 612 | 666 | 714 | 758 | 798 | 834 | 867 | 896 | 922 | 945 | 968 | 992 | 1,014 | 1,034 | 1,053 | 1,070 | 1,086 | 1,100 | 1,114 | 1,118 | 1,118 | 1,118 | 1,118 | 1,118 | 1,118 |
| 264 | TIPSY | 0 | 0 | 0 | 17 | 74 | 146 | 220 | 291 | 358 | 420 | 478 | 531 | 580 | 624 | 665 | 702 | 736 | 767 | 795 | 821 | 844 | 866 | 886 | 906 | 923 | 939 | 954 | 968 | 980 | 991 | 999 | 999 | 999 | 999 | 999 | 999 |
| 265 | TIPSY | 0 | 0 | 1 | 21 | 70 | 131 | 193 | 254 | 314 | 370 | 421 | 468 | 512 | 552 | 588 | 622 | 651 | 679 | 703 | 724 | 744 | 763 | 782 | 799 | 816 | 832 | 846 | 860 | 872 | 883 | 887 | 887 | 887 | 887 | 887 | 887 |
| 266 | TIPSY | 0 | 0 | 0 | 2 | 11 | 25 | 46 | 70 | 94 | 116 | 137 | 156 | 173 | 189 | 203 | 217 | 230 | 241 | 252 | 261 | 269 | 277 | 284 | 291 | 298 | 304 | 310 | 315 | 320 | 324 | 327 | 327 | 327 | 327 | 327 | 327 |
| 267 | TIPSY | 0 | 0 | 0 | 0 | 2 | 12 | 25 | 41 | 61 | 79 | 96 | 113 | 128 | 143 | 158 | 171 | 183 | 194 | 204 | 213 | 221 | 229 | 236 | 243 | 250 | 256 | 263 | 269 | 275 | 280 | 280 | 280 | 280 | 280 | 280 | 280 |
| 268 | TIPSY | 0 | 0 | 0 | 1 | 10 | 27 | 50 | 75 | 101 | 127 | 151 | 172 | 192 | 210 | 227 | 241 | 256 | 269 | 281 | 294 | 304 | 315 | 326 | 335 | 344 | 353 | 360 | 368 | 374 | 381 | 381 | 381 | 381 | 381 | 381 | 381 |
| 269 | TIPSY | 0 | 0 | 0 | 0 | 2 | 11 | 23 | 38 | 56 | 73 | 89 | 104 | 119 | 133 | 146 | 158 | 169 | 179 | 188 | 197 | 205 | 212 | 219 | 226 | 232 | 238 | 244 | 249 | 255 | 259 | 259 | 259 | 259 | 259 | 259 | 259 |
| 270 | TIPSY | 0 | 0 | 0 | 1 | 9 | 26 | 48 | 72 | 98 | 121 | 145 | 165 | 184 | 201 | 216 | 230 | 243 | 256 | 268 | 279 | 290 | 300 | 311 | 320 | 329 | 337 | 344 | 350 | 356 | 362 | 362 | 362 | 362 | 362 | 362 | 362 |
| 272 | TIPSY | 0 | 0 | 0 | 0 | 5 | 14 | 25 | 38 | 51 | 64 | 76 | 87 | 97 | 106 | 114 | 121 | 128 | 134 | 141 | 146 | 152 | 157 | 162 | 167 | 172 | 176 | 180 | 183 | 186 | 189 | 189 | 189 | 189 | 189 | 189 | 189 |
| 301 | TIPSY | 0 | 0 | 4 | 49 | 132 | 230 | 321 | 411 | 495 | 569 | 638 | 703 | 761 | 814 | 861 | 903 | 941 | 974 | 1,004 | 1,030 | 1,054 | 1,079 | 1,105 | 1,129 | 1,151 | 1,171 | 1,190 | 1,208 | 1,224 | 1,239 | 1,240 | 1,240 | 1,240 | 1,240 | 1,240 | 1,240 |
| 302 | TIPSY | 0 | 0 | 5 | 71 | 181 | 302 | 410 | 520 | 621 | 707 | 786 | 865 | 936 | 998 | 1,051 | 1,100 | 1,142 | 1,180 | 1,213 | 1,243 | 1,270 | 1,298 | 1,328 | 1,355 | 1,380 | 1,404 | 1,426 | 1,446 | 1,464 | 1,480 | 1,483 | 1,483 | 1,483 | 1,483 | 1,483 | 1,483 |
| 303 | TIPSY | 0 | 0 | 0 | 1 | 12 | 34 | 72 | 109 | 150 | 187 | 224 | 259 | 291 | 316 | 340 | 362 | 383 | 403 | 421 | 438 | 453 | 467 | 483 | 497 | 510 | 522 | 533 | 544 | 553 | 563 | 565 | 565 | 565 | 565 | 565 | 565 |
| 304 | TIPSY | 0 | 0 | 1 | 56 | 197 | 341 | 473 | 591 | 701 | 800 | 890 | 973 | 1,051 | 1,121 | 1,181 | 1,236 | 1,286 | 1,331 | 1,371 | 1,407 | 1,440 | 1,470 | 1,499 | 1,526 | 1,550 | 1,572 | 1,593 | 1,611 | 1,627 | 1,642 | 1,655 | 1,655 | 1,655 | 1,655 | 1,655 | 1,655 |
| 305 | TIPSY | 0 | 0 | 2 | 46 | 156 | 281 | 399 | 506 | 604 | 693 | 775 | 850 | 918 | 979 | 1,035 | 1,087 | 1,133 | 1,174 | 1,211 | 1,245 | 1,275 | 1,303 | 1,330 | 1,355 | 1,378 | 1,399 | 1,418 | 1,436 | 1,452 | 1,466 | 1,476 | 1,476 | 1,476 | 1,476 | 1,476 | 1,476 |
| 306 | TIPSY | 0 | 0 | 1 | 29 | 122 | 233 | 341 | 439 | 527 | 612 | 689 | 756 | 817 | 875 | 929 | 979 | 1,024 | 1,064 | 1,098 | 1,130 | 1,158 | 1,185 | 1,211 | 1,235 | 1,258 | 1,278 | 1,296 | 1,313 | 1,328 | 1,342 | 1,351 | 1,351 | 1,351 | 1,351 | 1,351 | 1,351 |
| 307 | TIPSY | 0 | 0 | 9 | 95 | 235 | 377 | 515 | 644 | 760 | 866 | 961 | 1,045 | 1,118 | 1,179 | 1,234 | 1,281 | 1,323 | 1,358 | 1,387 | 1,411 | 1,429 | 1,445 | 1,459 | 1,469 | 1,479 | 1,487 | 1,495 | 1,501 | 1,506 | 1,510 | 1,511 | 1,511 | 1,511 | 1,511 | 1,511 | 1,511 |
| 308 | TIPSY | 0 | 19 | 80 | 135 | 189 | 234 | 270 | 287 | 169 | 158 | 174 | 190 | 205 | 219 | 232 | 243 | 253 | 262 | 269 | 276 | 282 | 289 | 296 | 303 | 309 | 314 | 320 | 324 | 329 | 333 | 333 | 333 | 333 | 333 | 333 | 333 |
| 311 | TIPSY | 0 | 0 | 3 | 35 | 108 | 194 | 279 | 359 | 434 | 504 | 567 | 626 | 679 | 727 | 770 | 810 | 846 | 878 | 906 | 932 | 954 | 977 | 1,001 | 1,023 | 1,043 | 1,063 | 1,080 | 1,097 | 1,112 | 1,126 | 1,127 | 1,127 | 1,127 | 1,127 | 1,127 | 1,127 |
| 312 | TIPSY | 0 | 0 | 1 | 26 | 92 | 174 | 256 | 331 | 404 | 471 | 531 | 585 | 636 | 684 | 726 | 765 | 800 | 831 | 859 | 884 | 906 | 927 | 950 | 970 | 989 | 1,007 | 1,024 | 1,040 | 1,055 | 1,069 | 1,072 | 1,072 | 1,072 | 1,072 | 1,072 | 1,072 |
| 313 | TIPSY | 0 | 0 | 2 | 36 | 127 | 230 | 332 | 420 | 506 | 589 | 663 | 727 | 784 | 839 | 891 | 938 | 980 | 1,017 | 1,050 | 1,079 | 1,104 | 1,129 | 1,155 | 1,180 | 1,202 | 1,222 | 1,241 | 1,258 | 1,274 | 1,289 | 1,294 | 1,294 | 1,294 | 1,294 | 1,294 | 1,294 |
| 314 | TIPSY | 0 | 0 | 1 | 41 | 163 | 291 | 410 | 514 | 610 | 699 | 779 | 852 | 920 | 982 | 1,038 | 1,088 | 1,133 | 1,173 | 1,209 | 1,242 | 1,272 | 1,299 | 1,325 | 1,348 | 1,370 | 1,390 | 1,408 | 1,424 | 1,439 | 1,453 | 1,464 | 1,464 | 1,464 | 1,464 | 1,464 | 1,464 |
| 315 | TIPSY | 0 | 0 | 1 | 37 | 142 | 256 | 363 | 458 | 547 | 628 | 703 | 771 | 833 | 890 | 942 | 989 | 1,030 | 1,068 | 1,102 | 1,133 | 1,160 | 1,186 | 1,210 | 1,233 | 1,254 | 1,273 | 1,290 | 1,306 | 1,320 | 1,333 | 1,342 | 1,342 | 1,342 | 1,342 | 1,342 | 1,342 |
| 316 | TIPSY | 0 | 0 | 1 | 27 | 109 | 210 | 308 | 396 | 478 | 554 | 622 | 684 | 741 | 793 | 842 | 887 | 926 | 962 | 993 | 1,022 | 1,049 | 1,073 | 1,097 | 1,119 | 1,139 | 1,158 | 1,174 | 1,190 | 1,204 | 1,216 | 1,225 | 1,225 | 1,225 | 1,225 | 1,225 | 1,225 |

| Au | Model | age_0 | age_10 | age_20 | age_30 | age_40 | age_50 | age_60 | age_70 | age_80 | age_90 | age_100 | age_110 | age_120 | age_130 | age_140 | age_150 | age_160 | age_170 | age_180 | age_190 | age_200 | age_210 | age_220 | age_230 | age_240 | age_250 | age_260 | age_270 | age_280 | age_290 | age_300 | age_310 | age_320 | age_330 | age_340 | age_350 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 317 | TIPSY | 0 | 0 | 5 | 84 | 216 | 352 | 479 | 607 | 716 | 818 | 914 | 999 | 1,070 | 1,133 | 1,178 | 1,221 | 1,259 | 1,292 | 1,322 | 1,347 | 1,367 | 1,385 | 1,401 | 1,415 | 1,430 | 1,442 | 1,453 | 1,461 | 1,469 | 1,475 | 1,475 | 1,475 | 1,475 | 1,475 | 1,475 | 1,475 |
| 318 | TIPSY | 0 | 19 | 82 | 138 | 190 | 234 | 269 | 287 | 162 | 147 | 161 | 178 | 192 | 206 | 217 | 228 | 237 | 245 | 253 | 259 | 265 | 271 | 278 | 284 | 290 | 296 | 301 | 306 | 310 | 314 | 314 | 314 | 314 | 314 | 314 | 314 |
| 320 | TIPSY | 0 | 0 | 6 | 59 | 143 | 228 | 308 | 385 | 461 | 527 | 585 | 640 | 690 | 734 | 774 | 809 | 840 | 867 | 891 | 914 | 934 | 954 | 973 | 989 | 1,005 | 1,019 | 1,033 | 1,045 | 1,056 | 1,064 | 1,064 | 1,064 | 1,064 | 1,064 | 1,064 | 1,064 |
| 321 | TIPSY | 0 | 0 | 1 | 16 | 66 | 134 | 202 | 271 | 334 | 388 | 438 | 487 | 535 | 578 | 617 | 652 | 684 | 710 | 731 | 751 | 768 | 786 | 806 | 827 | 847 | 866 | 884 | 901 | 917 | 930 | 931 | 931 | 931 | 931 | 931 | 931 |
| 322 | TIPSY | 0 | 0 | 1 | 12 | 53 | 119 | 185 | 252 | 316 | 368 | 413 | 463 | 509 | 551 | 589 | 624 | 654 | 682 | 702 | 721 | 738 | 755 | 774 | 793 | 814 | 833 | 850 | 867 | 883 | 898 | 899 | 899 | 899 | 899 | 899 | 899 |
| 324 | TIPSY | 0 | 0 | 0 | 29 | 98 | 163 | 222 | 272 | 320 | 363 | 399 | 435 | 466 | 497 | 522 | 542 | 561 | 579 | 594 | 608 | 620 | 631 | 642 | 652 | 661 | 669 | 677 | 684 | 689 | 694 | 699 | 699 | 699 | 699 | 699 | 699 |
| 325 | TIPSY | 0 | 0 | 0 | 16 | 61 | 113 | 161 | 204 | 244 | 279 | 312 | 341 | 367 | 391 | 414 | 434 | 451 | 467 | 481 | 494 | 505 | 516 | 526 | 536 | 544 | 552 | 559 | 565 | 571 | 576 | 579 | 579 | 579 | 579 | 579 | 579 |
| 326 | TIPSY | 0 | 0 | 0 | 1 | 9 | 27 | 52 | 80 | 107 | 132 | 154 | 174 | 193 | 211 | 226 | 240 | 252 | 264 | 274 | 284 | 294 | 302 | 311 | 318 | 325 | 332 | 339 | 344 | 349 | 353 | 356 | 356 | 356 | 356 | 356 | 356 |
| 328 | TIPSY | 0 | 13 | 66 | 114 | 163 | 202 | 237 | 253 | 160 | 156 | 172 | 187 | 201 | 214 | 228 | 240 | 250 | 259 | 266 | 273 | 279 | 285 | 292 | 299 | 305 | 311 | 316 | 320 | 324 | 328 | 328 | 328 | 328 | 328 | 328 | 328 |
| 331 | TIPSY | 0 | 0 | 18 | 111 | 230 | 347 | 467 | 572 | 672 | 761 | 839 | 905 | 966 | 1,020 | 1,071 | 1,114 | 1,151 | 1,183 | 1,212 | 1,240 | 1,264 | 1,286 | 1,308 | 1,326 | 1,343 | 1,358 | 1,372 | 1,385 | 1,397 | 1,409 | 1,409 | 1,409 | 1,409 | 1,409 | 1,409 | 1,409 |
| 332 | TIPSY | 0 | 0 | 0 | 5 | 25 | 56 | 95 | 132 | 168 | 201 | 230 | 256 | 281 | 304 | 328 | 350 | 370 | 389 | 405 | 420 | 433 | 447 | 459 | 471 | 482 | 492 | 502 | 510 | 519 | 527 | 527 | 527 | 527 | 527 | 527 | 527 |
| 335 | TIPSY | 0 | 0 | 2 | 43 | 115 | 193 | 264 | 333 | 403 | 467 | 521 | 573 | 621 | 664 | 704 | 739 | 769 | 796 | 820 | 842 | 862 | 882 | 900 | 917 | 934 | 949 | 963 | 976 | 987 | 995 | 995 | 995 | 995 | 995 | 995 | 995 |
| 341 | TIPSY | 0 | 0 | 6 | 57 | 143 | 228 | 308 | 389 | 465 | 529 | 590 | 647 | 698 | 742 | 781 | 815 | 846 | 874 | 900 | 923 | 943 | 964 | 984 | 1,003 | 1,020 | 1,033 | 1,044 | 1,054 | 1,063 | 1,072 | 1,072 | 1,072 | 1,072 | 1,072 | 1,072 | 1,072 |
| 344 | TIPSY | 0 | 0 | 15 | 93 | 200 | 302 | 407 | 507 | 589 | 669 | 743 | 806 | 860 | 907 | 950 | 989 | 1,024 | 1,057 | 1,087 | 1,114 | 1,137 | 1,156 | 1,175 | 1,188 | 1,201 | 1,214 | 1,226 | 1,236 | 1,245 | 1,253 | 1,253 | 1,253 | 1,253 | 1,253 | 1,253 | 1,253 |
| 345 | TIPSY | 0 | 0 | 5 | 56 | 142 | 226 | 307 | 388 | 462 | 526 | 590 | 647 | 697 | 741 | 779 | 813 | 845 | 873 | 899 | 923 | 945 | 966 | 986 | 1,002 | 1,017 | 1,030 | 1,042 | 1,052 | 1,061 | 1,070 | 1,070 | 1,070 | 1,070 | 1,070 | 1,070 | 1,070 |
| 346 | TIPSY | 0 | 0 | 0 | 5 | 24 | 52 | 88 | 123 | 157 | 188 | 214 | 239 | 262 | 284 | 306 | 326 | 345 | 363 | 377 | 391 | 404 | 416 | 428 | 439 | 450 | 459 | 468 | 476 | 484 | 491 | 491 | 491 | 491 | 491 | 491 | 491 |
| 347 | TIPSY | 0 | 0 | 14 | 92 | 196 | 299 | 402 | 499 | 583 | 663 | 733 | 795 | 850 | 898 | 941 | 979 | 1,014 | 1,046 | 1,075 | 1,100 | 1,122 | 1,142 | 1,160 | 1,177 | 1,192 | 1,207 | 1,221 | 1,234 | 1,245 | 1,256 | 1,256 | 1,256 | 1,256 | 1,256 | 1,256 | 1,256 |
| 348 | TIPSY | 0 | 0 | 1 | 22 | 66 | 118 | 172 | 224 | 273 | 316 | 356 | 395 | 430 | 462 | 491 | 517 | 540 | 562 | 582 | 600 | 617 | 633 | 648 | 663 | 677 | 688 | 698 | 706 | 715 | 723 | 723 | 723 | 723 | 723 | 723 | 723 |
| 351 | TIPSY | 0 | 0 | 1 | 16 | 46 | 79 | 111 | 138 | 167 | 194 | 220 | 241 | 259 | 278 | 296 | 312 | 325 | 337 | 348 | 357 | 365 | 373 | 381 | 388 | 395 | 401 | 407 | 412 | 416 | 420 | 420 | 420 | 420 | 420 | 420 | 420 |
| 354 | TIPSY | 0 | 0 | 5 | 42 | 93 | 141 | 191 | 239 | 277 | 315 | 350 | 380 | 404 | 426 | 446 | 465 | 481 | 497 | 510 | 522 | 532 | 541 | 549 | 556 | 563 | 570 | 576 | 581 | 586 | 591 | 591 | 591 | 591 | 591 | 591 | 591 |
| 355 | TIPSY | 0 | 0 | 2 | 26 | 69 | 111 | 150 | 188 | 225 | 256 | 285 | 314 | 337 | 359 | 378 | 394 | 408 | 422 | 434 | 445 | 454 | 463 | 473 | 482 | 490 | 496 | 501 | 505 | 510 | 514 | 514 | 514 | 514 | 514 | 514 | 514 |
| 358 | TIPSY | 0 | 0 | 6 | 45 | 95 | 145 | 195 | 237 | 280 | 317 | 350 | 377 | 402 | 425 | 446 | 464 | 481 | 495 | 506 | 516 | 525 | 534 | 544 | 552 | 560 | 566 | 571 | 577 | 581 | 585 | 585 | 585 | 585 | 585 | 585 | 585 |
| 362 | TIPSY | 0 | 0 | 1 | 17 | 75 | 167 | 262 | 351 | 431 | 505 | 573 | 634 | 690 | 739 | 785 | 828 | 870 | 906 | 940 | 970 | 998 | 1,023 | 1,047 | 1,069 | 1,090 | 1,109 | 1,128 | 1,144 | 1,160 | 1,174 | 1,183 | 1,183 | 1,183 | 1,183 | 1,183 | 1,183 |
| 363 | TIPSY | 0 | 0 | 1 | 14 | 61 | 124 | 192 | 254 | 314 | 372 | 426 | 473 | 516 | 555 | 590 | 625 | 657 | 685 | 711 | 734 | 754 | 774 | 794 | 812 | 829 | 844 | 858 | 872 | 884 | 895 | 899 | 899 | 899 | 899 | 899 | 899 |
| 364 | TIPSY | 0 | 0 | 0 | 12 | 65 | 147 | 230 | 308 | 380 | 444 | 503 | 558 | 611 | 658 | 700 | 738 | 772 | 803 | 833 | 861 | 887 | 911 | 934 | 955 | 974 | 991 | 1,007 | 1,022 | 1,035 | 1,047 | 1,054 | 1,054 | 1,054 | 1,054 | 1,054 | 1,054 |
| 367 | TIPSY | 0 | 0 | 0 | 0 | 2 | 7 | 19 | 31 | 49 | 66 | 81 | 96 | 110 | 123 | 135 | 147 | 157 | 167 | 177 | 186 | 194 | 202 | 210 | 217 | 225 | 232 | 238 | 243 | 247 | 252 | 252 | 252 | 252 | 252 | 252 | 252 |
| 369 | TIPSY | 0 | 0 | 0 | 0 | 1 | 6 | 18 | 29 | 45 | 61 | 76 | 89 | 103 | 115 | 126 | 137 | 146 | 156 | 165 | 173 | 181 | 188 | 196 | 203 | 209 | 216 | 222 | 226 | 230 | 235 | 235 | 235 | 235 | 235 | 235 | 235 |
| 401 | TIPSY | 0 | 0 | 2 | 32 | 111 | 197 | 292 | 370 | 445 | 521 | 591 | 654 | 705 | 749 | 788 | 833 | 874 | 911 | 945 | 970 | 993 | 1,017 | 1,041 | 1,063 | 1,083 | 1,102 | 1,120 | 1,137 | 1,154 | 1,168 | 1,169 | 1,169 | 1,169 | 1,169 | 1,169 | 1,169 |
| 402 | TIPSY | 0 | 0 | 4 | 58 | 157 | 269 | 371 | 470 | 564 | 648 | 722 | 792 | 857 | 917 | 970 | 1,016 | 1,057 | 1,093 | 1,125 | 1,154 | 1,180 | 1,207 | 1,235 | 1,260 | 1,284 | 1,306 | 1,326 | 1,344 | 1,362 | 1,377 | 1,379 | 1,379 | 1,379 | 1,379 | 1,379 | 1,379 |
| 403 | TIPSY | 0 | 0 | 4 | 45 | 130 | 229 | 325 | 415 | 500 | 577 | 648 | 713 | 772 | 826 | 875 | 917 | 956 | 991 | 1,022 | 1,050 | 1,075 | 1,100 | 1,126 | 1,150 | 1,172 | 1,191 | 1,209 | 1,226 | 1,241 | 1,254 | 1,259 | 1,259 | 1,259 | 1,259 | 1,259 | 1,259 |
| 404 | TIPSY | 0 | 0 | 1 | 46 | 160 | 285 | 403 | 513 | 613 | 703 | 788 | 864 | 934 | 996 | 1,051 | 1,103 | 1,151 | 1,193 | 1,229 | 1,263 | 1,294 | 1,322 | 1,350 | 1,376 | 1,399 | 1,419 | 1,438 | 1,456 | 1,472 | 1,487 | 1,498 | 1,498 | 1,498 | 1,498 | 1,498 | 1,498 |
| 405 | TIPSY | 0 | 0 | 2 | 39 | 153 | 279 | 399 | 507 | 602 | 692 | 777 | 851 | 917 | 978 | 1,035 | 1,088 | 1,137 | 1,181 | 1,218 | 1,252 | 1,282 | 1,309 | 1,337 | 1,362 | 1,386 | 1,406 | 1,426 | 1,443 | 1,458 | 1,473 | 1,482 | 1,482 | 1,482 | 1,482 | 1,482 | 1,482 |
| 406 | TIPSY | 0 | 0 | 1 | 33 | 142 | 264 | 380 | 486 | 579 | 668 | 752 | 824 | 886 | 947 | 1,005 | 1,057 | 1,107 | 1,152 | 1,187 | 1,218 | 1,247 | 1,275 | 1,302 | 1,327 | 1,351 | 1,372 | 1,389 | 1,406 | 1,421 | 1,435 | 1,445 | 1,445 | 1,445 | 1,445 | 1,445 | 1,445 |
| 410 | TIPSY | 0 | 0 | 23 | 126 | 250 | 376 | 502 | 608 | 715 | 806 | 884 | 949 | 1,012 | 1,069 | 1,123 | 1,168 | 1,203 | 1,234 | 1,262 | 1,289 | 1,313 | 1,336 | 1,359 | 1,378 | 1,395 | 1,410 | 1,424 | 1,437 | 1,449 | 1,461 | 1,461 | 1,461 | 1,461 | 1,461 | 1,461 | 1,461 |
| 411 | TIPSY | 0 | 0 | 2 | 31 | 94 | 173 | 251 | 327 | 398 | 460 | 519 | 576 | 627 | 672 | 713 | 749 | 782 | 811 | 837 | 861 | 882 | 904 | 928 | 950 | 971 | 990 | 1,007 | 1,022 | 1,037 | 1,050 | 1,051 | 1,051 | 1,051 | 1,051 | 1,051 | 1,051 |

| Au | Model | age_0 | age_10 | age_20 | age_30 | age_40 | age_50 | age_60 | age_70 | age_80 | age_90 | age_100 | age_110 | age_120 | age_130 | age_140 | age_150 | age_160 | age_170 | age_180 | age_190 | age_200 | age_210 | age_220 | age_230 | age_240 | age_250 | age_260 | age_270 | age_280 | age_290 | age_300 | age_310 | age_320 | age_330 | age_340 | age_350 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 412 | TIPSY | 0 | 0 | 2 | 28 | 93 | 174 | 256 | 334 | 405 | 469 | 530 | 589 | 641 | 687 | 728 | 765 | 798 | 828 | 856 | 881 | 904 | 927 | 951 | 973 | 994 | 1,013 | 1,030 | 1,046 | 1,061 | 1,074 | 1,076 | 1,076 | 1,076 | 1,076 | 1,076 | 1,076 |
| 413 | TIPSY | 0 | 0 | 2 | 29 | 104 | 193 | 282 | 364 | 441 | 513 | 579 | 639 | 693 | 742 | 787 | 829 | 866 | 899 | 929 | 956 | 980 | 1,003 | 1,028 | 1,050 | 1,071 | 1,090 | 1,107 | 1,123 | 1,138 | 1,151 | 1,156 | 1,156 | 1,156 | 1,156 | 1,156 | 1,156 |
| 414 | TIPSY | 0 | 0 | 1 | 36 | 143 | 263 | 375 | 475 | 567 | 650 | 727 | 798 | 863 | 922 | 974 | 1,021 | 1,065 | 1,104 | 1,139 | 1,171 | 1,200 | 1,226 | 1,252 | 1,275 | 1,297 | 1,316 | 1,334 | 1,350 | 1,364 | 1,378 | 1,389 | 1,389 | 1,389 | 1,389 | 1,389 | 1,389 |
| 415 | TIPSY | 0 | 0 | 2 | 34 | 128 | 237 | 341 | 436 | 521 | 599 | 672 | 739 | 799 | 853 | 902 | 947 | 989 | 1,027 | 1,061 | 1,091 | 1,118 | 1,142 | 1,166 | 1,189 | 1,209 | 1,228 | 1,245 | 1,261 | 1,275 | 1,288 | 1,296 | 1,296 | 1,296 | 1,296 | 1,296 | 1,296 |
| 416 | TIPSY | 0 | 0 | 1 | 13 | 54 | 118 | 193 | 267 | 334 | 394 | 450 | 503 | 551 | 593 | 631 | 667 | 700 | 731 | 757 | 783 | 806 | 828 | 849 | 868 | 886 | 902 | 917 | 931 | 944 | 956 | 963 | 963 | 963 | 963 | 963 | 963 |
| 420 | TIPSY | 0 | 0 | 7 | 55 | 125 | 201 | 278 | 347 | 414 | 474 | 527 | 575 | 618 | 659 | 695 | 728 | 757 | 782 | 805 | 825 | 843 | 861 | 879 | 895 | 910 | 923 | 934 | 945 | 955 | 964 | 964 | 964 | 964 | 964 | 964 | 964 |
| 421 | TIPSY | 0 | 0 | 0 | 6 | 41 | 98 | 155 | 210 | 266 | 317 | 361 | 399 | 434 | 472 | 507 | 539 | 568 | 592 | 615 | 636 | 654 | 672 | 690 | 704 | 718 | 731 | 743 | 754 | 766 | 777 | 778 | 778 | 778 | 778 | 778 | 778 |
| 422 | TIPSY | 0 | 0 | 1 | 17 | 72 | 146 | 219 | 291 | 358 | 415 | 466 | 519 | 569 | 614 | 655 | 692 | 726 | 753 | 776 | 796 | 815 | 833 | 854 | 875 | 896 | 916 | 934 | 951 | 967 | 981 | 983 | 983 | 983 | 983 | 983 | 983 |
| 423 | TIPSY | 0 | 0 | 1 | 20 | 84 | 167 | 249 | 324 | 396 | 462 | 520 | 573 | 624 | 672 | 717 | 756 | 792 | 824 | 852 | 876 | 897 | 918 | 939 | 959 | 978 | 995 | 1,013 | 1,029 | 1,045 | 1,058 | 1,063 | 1,063 | 1,063 | 1,063 | 1,063 | 1,063 |
| 424 | TIPSY | 0 | 0 | 0 | 22 | 86 | 148 | 206 | 252 | 297 | 339 | 374 | 407 | 438 | 467 | 493 | 514 | 532 | 549 | 564 | 578 | 591 | 602 | 612 | 622 | 631 | 639 | 646 | 653 | 660 | 665 | 669 | 669 | 669 | 669 | 669 | 669 |
| 430 | TIPSY | 0 | 0 | 4 | 33 | 81 | 126 | 170 | 215 | 253 | 287 | 321 | 350 | 375 | 397 | 416 | 433 | 448 | 463 | 476 | 488 | 499 | 510 | 518 | 525 | 532 | 538 | 543 | 548 | 552 | 557 | 557 | 557 | 557 | 557 | 557 | 557 |
| 461 | TIPSY | 0 | 0 | 1 | 9 | 31 | 65 | 103 | 143 | 186 | 227 | 266 | 299 | 330 | 359 | 388 | 414 | 438 | 459 | 478 | 495 | 510 | 524 | 539 | 553 | 566 | 578 | 590 | 601 | 610 | 618 | 621 | 621 | 621 | 621 | 621 | 621 |
| 462 | TIPSY | 0 | 0 | 0 | 1 | 8 | 26 | 59 | 101 | 147 | 191 | 232 | 271 | 306 | 338 | 367 | 395 | 421 | 446 | 469 | 488 | 507 | 523 | 539 | 554 | 568 | 582 | 594 | 606 | 616 | 627 | 633 | 633 | 633 | 633 | 633 | 633 |
| 463 | TIPSY | 0 | 0 | 0 | 3 | 14 | 37 | 65 | 99 | 135 | 169 | 202 | 231 | 259 | 284 | 309 | 332 | 353 | 372 | 389 | 405 | 417 | 431 | 444 | 456 | 468 | 478 | 488 | 498 | 506 | 514 | 516 | 516 | 516 | 516 | 516 | 516 |
| 464 | TIPSY | 0 | 0 | 0 | 5 | 32 | 76 | 129 | 184 | 238 | 288 | 335 | 380 | 420 | 456 | 489 | 520 | 549 | 577 | 603 | 626 | 645 | 663 | 681 | 697 | 713 | 727 | 741 | 753 | 764 | 775 | 781 | 781 | 781 | 781 | 781 | 781 |
| 601 | TIPSY | 0 | 0 | 2 | 32 | 111 | 197 | 292 | 370 | 445 | 521 | 591 | 654 | 705 | 749 | 788 | 833 | 874 | 911 | 945 | 970 | 993 | 1,017 | 1,041 | 1,063 | 1,083 | 1,102 | 1,120 | 1,137 | 1,154 | 1,168 | 1,169 | 1,169 | 1,169 | 1,169 | 1,169 | 1,169 |
| 602 | TIPSY | 0 | 0 | 4 | 58 | 157 | 269 | 371 | 470 | 564 | 648 | 722 | 792 | 857 | 917 | 970 | 1,016 | 1,057 | 1,093 | 1,125 | 1,154 | 1,180 | 1,207 | 1,235 | 1,260 | 1,284 | 1,306 | 1,326 | 1,344 | 1,362 | 1,377 | 1,379 | 1,379 | 1,379 | 1,379 | 1,379 | 1,379 |
| 603 | TIPSY | 0 | 0 | 4 | 45 | 130 | 229 | 325 | 415 | 500 | 577 | 648 | 713 | 772 | 826 | 875 | 917 | 956 | 991 | 1,022 | 1,050 | 1,075 | 1,100 | 1,126 | 1,150 | 1,172 | 1,191 | 1,209 | 1,226 | 1,241 | 1,254 | 1,259 | 1,259 | 1,259 | 1,259 | 1,259 | 1,259 |
| 604 | TIPSY | 0 | 0 | 1 | 46 | 160 | 285 | 403 | 513 | 613 | 703 | 788 | 864 | 934 | 996 | 1,051 | 1,103 | 1,151 | 1,193 | 1,229 | 1,263 | 1,294 | 1,322 | 1,350 | 1,376 | 1,399 | 1,419 | 1,438 | 1,456 | 1,472 | 1,487 | 1,498 | 1,498 | 1,498 | 1,498 | 1,498 | 1,498 |
| 605 | TIPSY | 0 | 0 | 2 | 39 | 153 | 279 | 399 | 507 | 602 | 692 | 777 | 851 | 917 | 978 | 1,035 | 1,088 | 1,137 | 1,181 | 1,218 | 1,252 | 1,282 | 1,309 | 1,337 | 1,362 | 1,386 | 1,406 | 1,426 | 1,443 | 1,458 | 1,473 | 1,482 | 1,482 | 1,482 | 1,482 | 1,482 | 1,482 |
| 606 | TIPSY | 0 | 0 | 1 | 33 | 142 | 264 | 380 | 486 | 579 | 668 | 752 | 824 | 886 | 947 | 1,005 | 1,057 | 1,107 | 1,152 | 1,187 | 1,218 | 1,247 | 1,275 | 1,302 | 1,327 | 1,351 | 1,372 | 1,389 | 1,406 | 1,421 | 1,435 | 1,445 | 1,445 | 1,445 | 1,445 | 1,445 | 1,445 |
| 610 | TIPSY | 0 | 0 | 23 | 126 | 250 | 376 | 502 | 608 | 715 | 806 | 884 | 949 | 1,012 | 1,069 | 1,123 | 1,168 | 1,203 | 1,234 | 1,262 | 1,289 | 1,313 | 1,336 | 1,359 | 1,378 | 1,395 | 1,410 | 1,424 | 1,437 | 1,449 | 1,461 | 1,461 | 1,461 | 1,461 | 1,461 | 1,461 | 1,461 |
| 611 | TIPSY | 0 | 0 | 2 | 31 | 94 | 173 | 251 | 327 | 398 | 460 | 519 | 576 | 627 | 672 | 713 | 749 | 782 | 811 | 837 | 861 | 882 | 904 | 928 | 950 | 971 | 990 | 1,007 | 1,022 | 1,037 | 1,050 | 1,051 | 1,051 | 1,051 | 1,051 | 1,051 | 1,051 |
| 612 | TIPSY | 0 | 0 | 2 | 28 | 93 | 174 | 256 | 334 | 405 | 469 | 530 | 589 | 641 | 687 | 728 | 765 | 798 | 828 | 856 | 881 | 904 | 927 | 951 | 973 | 994 | 1,013 | 1,030 | 1,046 | 1,061 | 1,074 | 1,076 | 1,076 | 1,076 | 1,076 | 1,076 | 1,076 |
| 613 | TIPSY | 0 | 0 | 2 | 29 | 104 | 193 | 282 | 364 | 441 | 513 | 579 | 639 | 693 | 742 | 787 | 829 | 866 | 899 | 929 | 956 | 980 | 1,003 | 1,028 | 1,050 | 1,071 | 1,090 | 1,107 | 1,123 | 1,138 | 1,151 | 1,156 | 1,156 | 1,156 | 1,156 | 1,156 | 1,156 |
| 614 | TIPSY | 0 | 0 | 1 | 36 | 143 | 263 | 375 | 475 | 567 | 650 | 727 | 798 | 863 | 922 | 974 | 1,021 | 1,065 | 1,104 | 1,139 | 1,171 | 1,200 | 1,226 | 1,252 | 1,275 | 1,297 | 1,316 | 1,334 | 1,350 | 1,364 | 1,378 | 1,389 | 1,389 | 1,389 | 1,389 | 1,389 | 1,389 |
| 615 | TIPSY | 0 | 0 | 2 | 34 | 128 | 237 | 341 | 436 | 521 | 599 | 672 | 739 | 799 | 853 | 902 | 947 | 989 | 1,027 | 1,061 | 1,091 | 1,118 | 1,142 | 1,166 | 1,189 | 1,209 | 1,228 | 1,245 | 1,261 | 1,275 | 1,288 | 1,296 | 1,296 | 1,296 | 1,296 | 1,296 | 1,296 |
| 616 | TIPSY | 0 | 0 | 1 | 13 | 54 | 118 | 193 | 267 | 334 | 394 | 450 | 503 | 551 | 593 | 631 | 667 | 700 | 731 | 757 | 783 | 806 | 828 | 849 | 868 | 886 | 902 | 917 | 931 | 944 | 956 | 963 | 963 | 963 | 963 | 963 | 963 |
| 620 | TIPSY | 0 | 0 | 7 | 55 | 125 | 201 | 278 | 347 | 414 | 474 | 527 | 575 | 618 | 659 | 695 | 728 | 757 | 782 | 805 | 825 | 843 | 861 | 879 | 895 | 910 | 923 | 934 | 945 | 955 | 964 | 964 | 964 | 964 | 964 | 964 | 964 |
| 621 | TIPSY | 0 | 0 | 0 | 6 | 41 | 98 | 155 | 210 | 266 | 317 | 361 | 399 | 434 | 472 | 507 | 539 | 568 | 592 | 615 | 636 | 654 | 672 | 690 | 704 | 718 | 731 | 743 | 754 | 766 | 777 | 778 | 778 | 778 | 778 | 778 | 778 |
| 622 | TIPSY | 0 | 0 | 1 | 17 | 72 | 146 | 219 | 291 | 358 | 415 | 466 | 519 | 569 | 614 | 655 | 692 | 726 | 753 | 776 | 796 | 815 | 833 | 854 | 875 | 896 | 916 | 934 | 951 | 967 | 981 | 983 | 983 | 983 | 983 | 983 | 983 |
| 623 | TIPSY | 0 | 0 | 1 | 20 | 84 | 167 | 249 | 324 | 396 | 462 | 520 | 573 | 624 | 672 | 717 | 756 | 792 | 824 | 852 | 876 | 897 | 918 | 939 | 959 | 978 | 995 | 1,013 | 1,029 | 1,045 | 1,058 | 1,063 | 1,063 | 1,063 | 1,063 | 1,063 | 1,063 |
| 624 | TIPSY | 0 | 0 | 0 | 22 | 86 | 148 | 206 | 252 | 297 | 339 | 374 | 407 | 438 | 467 | 493 | 514 | 532 | 549 | 564 | 578 | 591 | 602 | 612 | 622 | 631 | 639 | 646 | 653 | 660 | 665 | 669 | 669 | 669 | 669 | 669 | 669 |
| 630 | TIPSY | 0 | 0 | 4 | 33 | 81 | 126 | 170 | 215 | 253 | 287 | 321 | 350 | 375 | 397 | 416 | 433 | 448 | 463 | 476 | 488 | 499 | 510 | 518 | 525 | 532 | 538 | 543 | 548 | 552 | 557 | 557 | 557 | 557 | 557 | 557 | 557 |
| 661 | TIPSY | 0 | 0 | 1 | 9 | 31 | 65 | 103 | 143 | 186 | 227 | 266 | 299 | 330 | 359 | 388 | 414 | 438 | 459 | 478 | 495 | 510 | 524 | 539 | 553 | 566 | 578 | 590 | 601 | 610 | 618 | 621 | 621 | 621 | 621 | 621 | 621 |

| Au | Model | age_0 | age_10 | age_20 | age_30 | age_40 | age_50 | age_60 | age_70 | age_80 | age_90 | age_100 | age_110 | age_120 | age_130 | age_140 | age_150 | age_160 | age_170 | age_180 | age_190 | age_200 | age_210 | age_220 | age_230 | age_240 | age_250 | age_260 | age_270 | age_280 | age_290 | age_300 | age_310 | age_320 | age_330 | age_340 | age_350 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 662 | TIPSY | 0 | 0 | 0 | 1 | 8 | 26 | 59 | 101 | 147 | 191 | 232 | 271 | 306 | 338 | 367 | 395 | 421 | 446 | 469 | 488 | 507 | 523 | 539 | 554 | 568 | 582 | 594 | 606 | 616 | 627 | 633 | 633 | 633 | 633 | 633 | 633 |
| 663 | TIPSY | 0 | 0 | 0 | 3 | 14 | 37 | 65 | 99 | 135 | 169 | 202 | 231 | 259 | 284 | 309 | 332 | 353 | 372 | 389 | 405 | 417 | 431 | 444 | 456 | 468 | 478 | 488 | 498 | 506 | 514 | 516 | 516 | 516 | 516 | 516 | 516 |
| 664 | TIPSY | 0 | 0 | 0 | 5 | 32 | 76 | 129 | 184 | 238 | 288 | 335 | 380 | 420 | 456 | 489 | 520 | 549 | 577 | 603 | 626 | 645 | 663 | 681 | 697 | 713 | 727 | 741 | 753 | 764 | 775 | 781 | 781 | 781 | 781 | 781 | 781 |