Harvest Monitoring Protocol – Mid Coast TSA Case Study

Coast Region FRPA Implementation Team -Resource Planning Working Group Update for discussion

November 2012

Introduction

The 2011 discussion report "*Summary of Cedar Management Considerations for Coastal British Columbia*" included a recommendation (#2) for government and licensees to jointly develop and apply a protocol to monitor and assess harvest profiles for timber supply areas. Such a protocol should ensure that the most appropriate information is used in a consistent manner.

In response to this recommendation the Coast Operational Issues Forum (OIF) requested that the Coast Region FRPA Implementation Team (CRIT) assess and identify options specific to three of the recommendations in the document (recommendations 1, 2, 4). CRIT forwarded this issue to its Resource Planning Working Group (RPWG) chaired to develop a work plan. Phase 1 of the work plan will investigate issues regarding species harvest profiles and will address recommendation #2. Phase 2 will address recommendations #1 and #4 after Phase 1 is completed.

One of the steps in the work plan was for the RPWG to complete a case study report which examined the information sources available to develop a harvest monitoring protocol and to assemble the data for one timber supply area. The Mid Coast Timber Supply Area (TSA) was selected because the RPWG felt it had a range of management and data issues representative of coastal TSAs and was suitable for the development and testing of a robust protocol. This report is the harvest monitoring case study for the Mid Coast TSA.

Method

The case study examines information available from four principle sources: timber scale data from the Harvest Billing System (HBS), cruise data from the Electronic Commerce Appraisal System (ECAS), forest inventory data for the TSA, cutblock boundaries from multiple sources and information reported in the previous timber supply review (TSR). These data were assembled for the Mid Coast TSA in a manner that allowed examination and comparison of cedar harvest rates. In each case an attempt was made to contrast actual harvest rates (from the various sources) to species harvest projections from the TSR base case.

Harvest Billing Data

HBS data are available from 1979 to the present and can be used to summarize the timber volume billed from the management unit, by species, grade and waste class with further aggregation by district, management unit type, land ownership type, forest file type (i.e., licence type), timber mark and billing or scaling date. The following charts illustrate the trend in total volume billed in the period from 1985 to 2010 for the Coast Region and the Mid Coast TSA. They depict all billed volume from Crown lands, including waste, aggregated into five species groups. The data in the two charts is the same. The upper chart is volume in cubic metres the lower chart is species volume expressed as a percent of the total volume billed. Figure 1a is the Coast Region overall and Figure 1b is the Mid Coast TSA only.

Figure 1a. HBS billed volume – Coast Region– 1985 to 2011

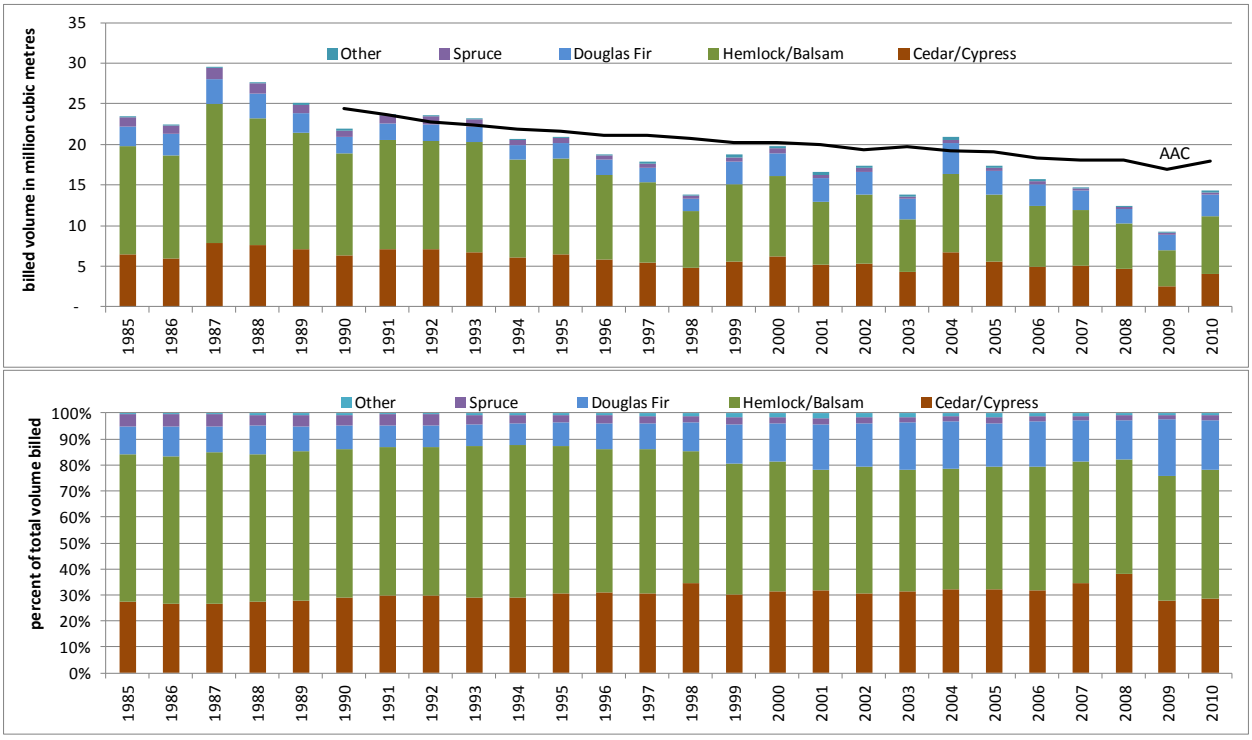
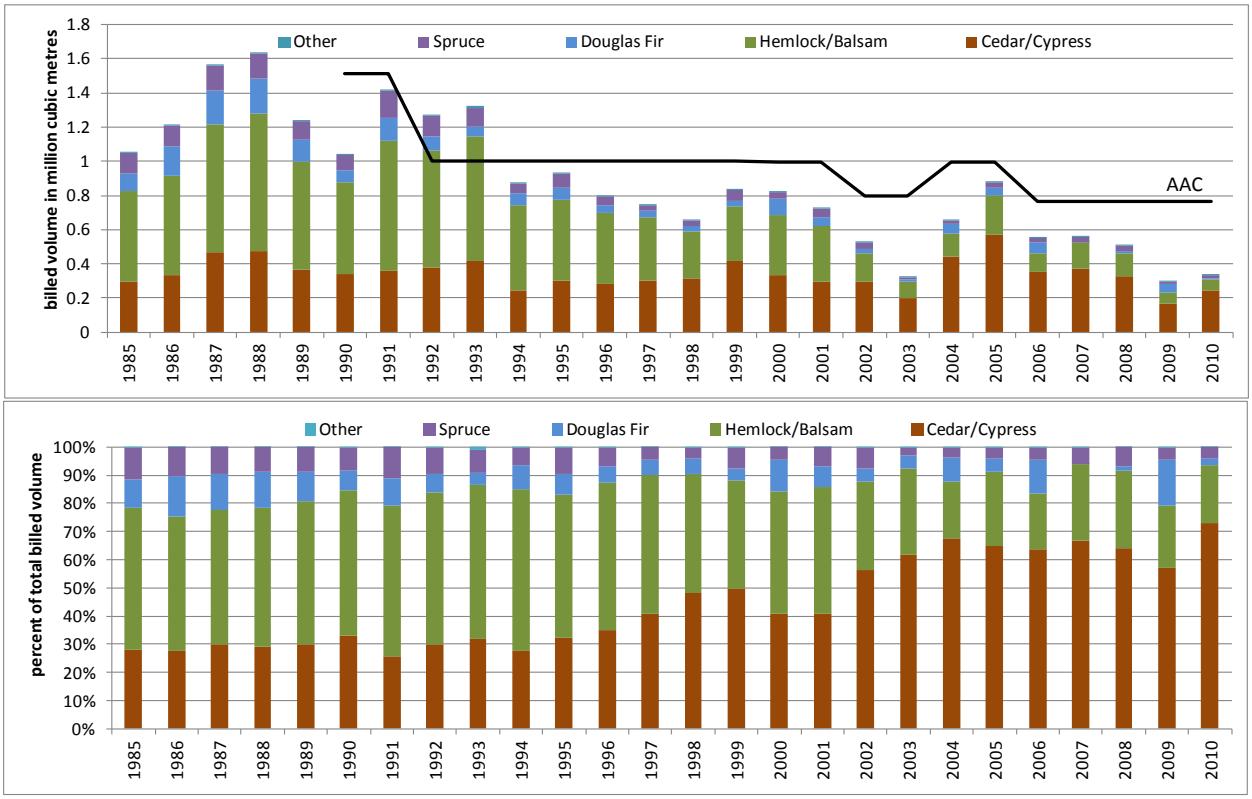


Figure 1b. HBS billed volume – Mid Coast TSA – 1985 to 2011



The HBS billed volume data is useful for tracking the long-term trends in the actual volume billed for one or more management units. It can be used to compare absolute and proportional amounts of volume harvested by species, species group (as depicted above) and timber grade or for other aggregations such as management unit type, licence type, waste type, selling-price zone and forest tenure.

The following observations are made with respect to the Mid Coast TSA charts in Figure 1b:

- the overall harvest level decreases from the later 1980's to 2010 (from over 1 million m³ per year to less than 0.5 million m³ per year);
- in comparison to the overall harvest, the redcedar/cypress billed volumes have been more stable;
- the long-term declining trend in hemlock/balsam billed volume is the primary contributor to the overall harvest decline that has occurred since the 1990's.

HBS volumes compared to TSR data

The chart below compares the actual billed volume for each species group (including redcedar/cypress) to the annual volume of redcedar/cypress anticipated from the TSR 2 (1999) and TSR 3 (2010) analyses. The billed volumes are from HBS and include waste. The TSR2 and TSR3 anticipated volumes (solid and dashed lines) were calculated by multiplying the ratio of mature timber harvesting land base (THLB) volume for redcedar and cypress by the AAC (*the AAC did not include species partitions*). The TSR lines are not flat because the AAC amount fluctuated as various Part13 reductions were applied and removed over this period.

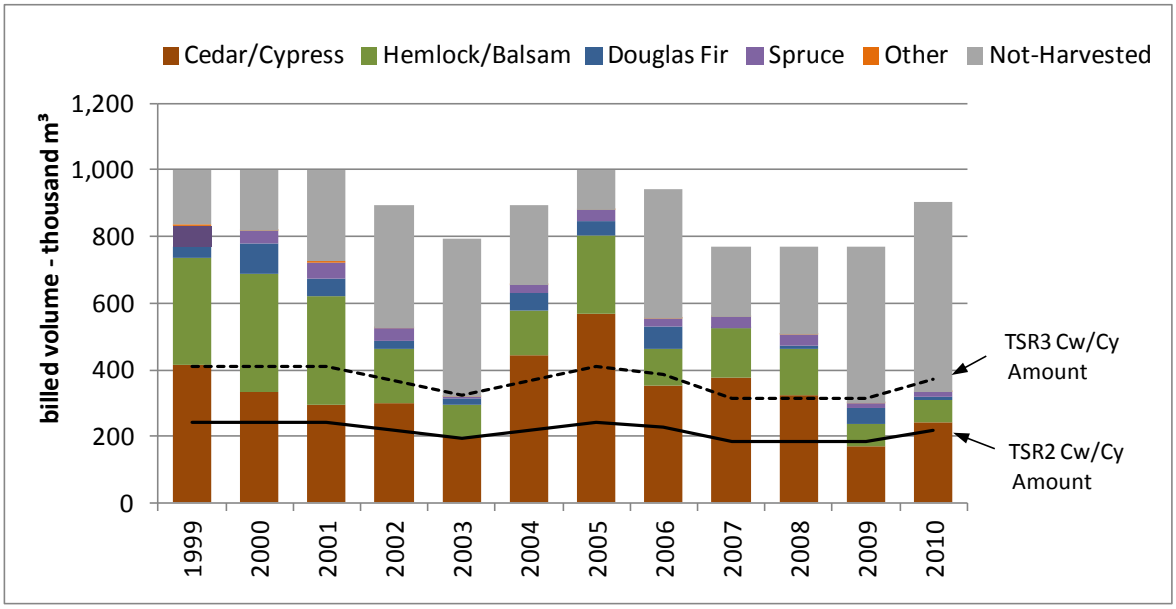


Figure 2. HBS billed volume compared to redcedar/cypress anticipated from TSR2 / TSR3– Mid Coast TSA

The following observations are made from the chart:

- The proportion of redcedar/cypress in the TSR3 THLB is higher than in the TSR2 THLB (and hemlock/balsam in TSR3 is lower than in the TSR2 THLB). This reflects the change in the population of stands classified as economically operable from TSR2 to TSR3. The TSR3 land base includes more redcedar stands and less hemlock/balsam stands.

- The average annual volume of redcedar/cypress harvested in the period shown is 335,000 m³. In comparison, the redcedar/cypress volume proportions calculated using TSR2 and TSR3 data are 216,000m³ and 366,000 m³, respectively (based on cedar in the mature THLB)
- The average annual volume of hemlock/balsam harvested in the period shown is 180,000 m³. In comparison, the hemlock/balsam proportion volume proportions calculated using TSR2 and TSR3 data are 544,000m³ and 447,000 m³, respectively (based on hemlock/balsam in the mature THLB)

Cruised volumes compared to TSR data

Cruise volume data are available through ECAS and can be summarized by district and timber mark. Since cruise volumes are compiled using a method that is roughly similar to the inventory method (though still with significant differences) the species proportions from TSR may be more comparable to cruise data.

The chart below breaks down the volume harvested in the Mid Coast TSA into species groups using volume proportions from cruise data (i.e., total volume is from HBS , species percent is from cruise for timber marks billed). Some timber marks in HBS cannot be linked to cruise data, therefore, the volume used to derive the proportions is only 88 percent of the HBS total for the period shown.

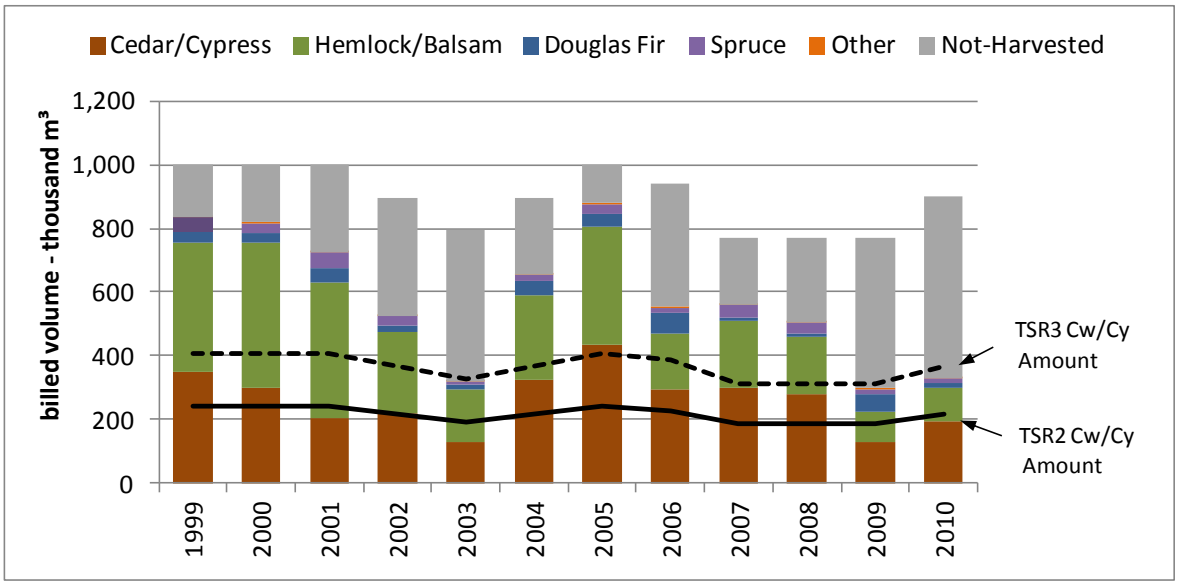


Figure 3. Harvest volume broken by species using cruise data – Mid Coast TSA

The following observations are made from these charts:

- The average annual redcedar/cypress harvest volume (when species proportions are from cruise data) in the period shown is 263,000 m³. In comparison, the redcedar/cypress volume proportions calculated using TSR2 and TSR3 data are 216,000m³ and 366,000 m³, respectively (based on cedar in the mature THLB)
- The average annual volume of hemlock/balsam using cruise data in the period shown is 260,000 m³ and the comparable TSR2 and TSR3 proportions are 544,000m³ and 447,000 m³ (based on hemlock/balsam mature THLB).

Given the complications involved with registering cruise data to HBS data, and since the resulting trends generated from the data are very similar to those from the HBS data alone, the RPWG does not recommend that the harvest protocol include cruise data at this time.

Cutblock inventory data

FAIB compiles a cutblock layer for each TSA annually. This layer integrates information from multiple sources including: FTA cutblock mapping, RESULTS openings and satellite imagery.

The TSR2 (1999) forest inventory data (compiled with VDYP7) was combined with the consolidated cutblock layer in order to compare the species proportions in the cutblocks to the species proportions in the mature THLB. The following chart illustrates this comparison.

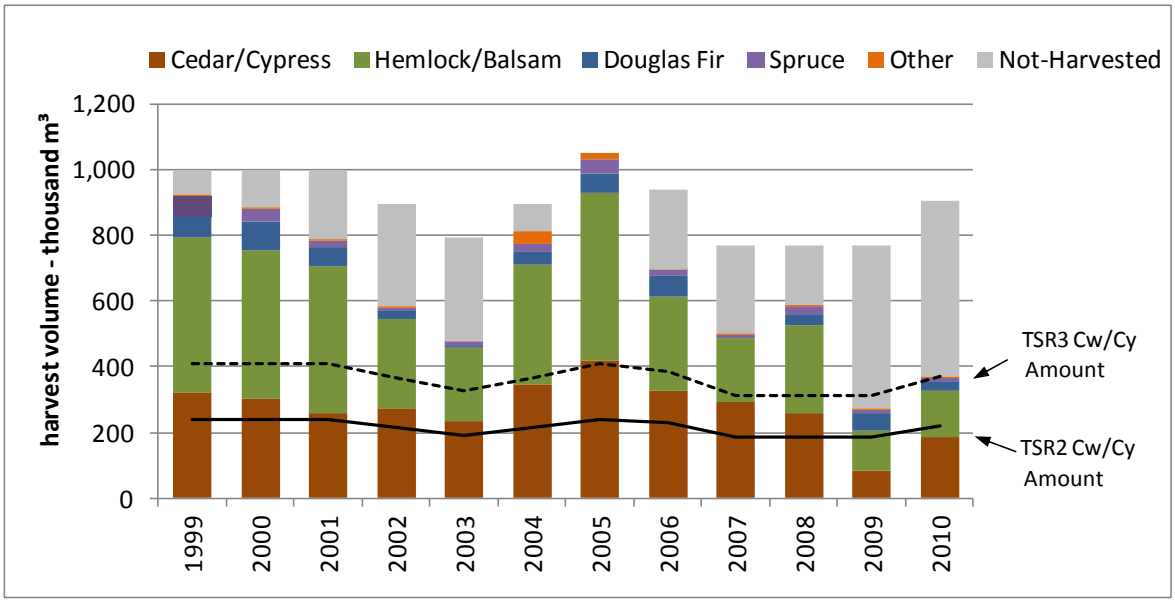


Figure 4. Harvest volume by species using cutblock inventory – Mid Coast TSA with reserve area filtered to exclude retention for ecological and visual quality objectives.

The following observations are made from these charts:

- With reserve areas filtered to exclude retention for biological and visual quality objectives, the total volume in the cutblock inventory is 13% greater than the total billed volume for the period from 1999 to 2010 (see the next section for further exploration of this). For the redcedar/cypress group the total cutblock inventory volume is 18% less than the total HBS volume. For hemlock/balsam the total cutblock inventory volume is 72% higher than the total HBS volume.

- The average annual volume of redcedar/cypress harvested in the cutblock inventory is 276,000 m³ compared to the TSR2 and TSR3 proportions which are 216,000m³ and 366,000 m³, respectively (based on cedar in the mature THLB)

- The average annual volume of hemlock/balsam harvested in the cutblock inventory is 312,000 m³ and the comparable TSR2 and TSR3 hemlock/balsam volumes are 544,000m³ and 447,000 m³ , respectively (based on mature THLB)

Cutblock inventory volume compared to HBS billed volume

As noted in the previous chart, the total volume in the cutblock inventory is greater than the total billed volume in almost every year. This may be due to a number of reasons some of which are listed below. However, this study has not the collected information needed to identify which of these reasons, or any other, are significantly contributing to the difference. Further investigation on this may be warranted.

Reasons why annual cutblock inventory volumes vary from HBS billed volumes:

- the cutblock inventory does not map all reserve areas or dispersed retention; so the volume within unmapped reserves are included in the cutblock total but are not harvested;
- cutblocks block boundaries do not align with inventory polygon boundaries, so the attributes driving stand volume and value estimates in harvested areas may be different from polygon averages;
- uncertainty with merchantable volume estimates in the cutblock inventory (i.e., due to loss factors or inventory attributes), and
- variability or uncertainty with waste assessments, for example waste assessment results are not always reported in the same year harvest.

The chart below compares the cutblock inventory volume for cedar/cypress and hemlock/balsam to HBS billed volumes in the Mid Coast TSA for the period 1999 to 2010.

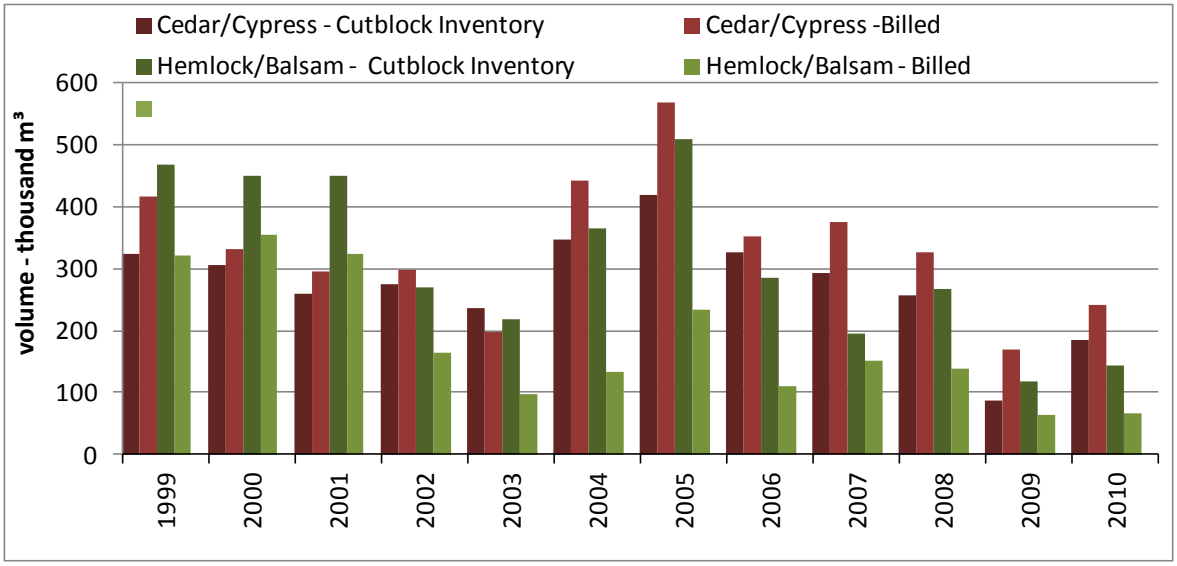


Figure 5. Cutblock inventory volume compared to HBS billed volume– Mid Coast TSA

The following observations are made from these charts:

- redcedar/cypress billed volume in all but one year exceeds the cutblock inventory volume.
- in every year, the hemlock/balsam billed volume is significantly less than the cutblock inventory volume.

In addition to the summary and comparison of harvest volumes by species or species group, the cutblock inventory data can be used to summarize and compare annual harvest across a number of inventory parameters. When THLB is included with the data, comparing the amount of harvest inside and outside of the THLB may be insightful. Other aggregations that may be of interest include harvest by stand age class, site index group or biogeoclimatic groups.

Figures 6 and 7 provide two examples of how cutblock inventory information may be aggregated and compared for the Mid Coast TSA. Figure 6 depicts the proportion of harvesting inside and outside the defined THLB defined in TSR 3 for each species group. Figure 7 depicts the distribution of harvest volume by age class.

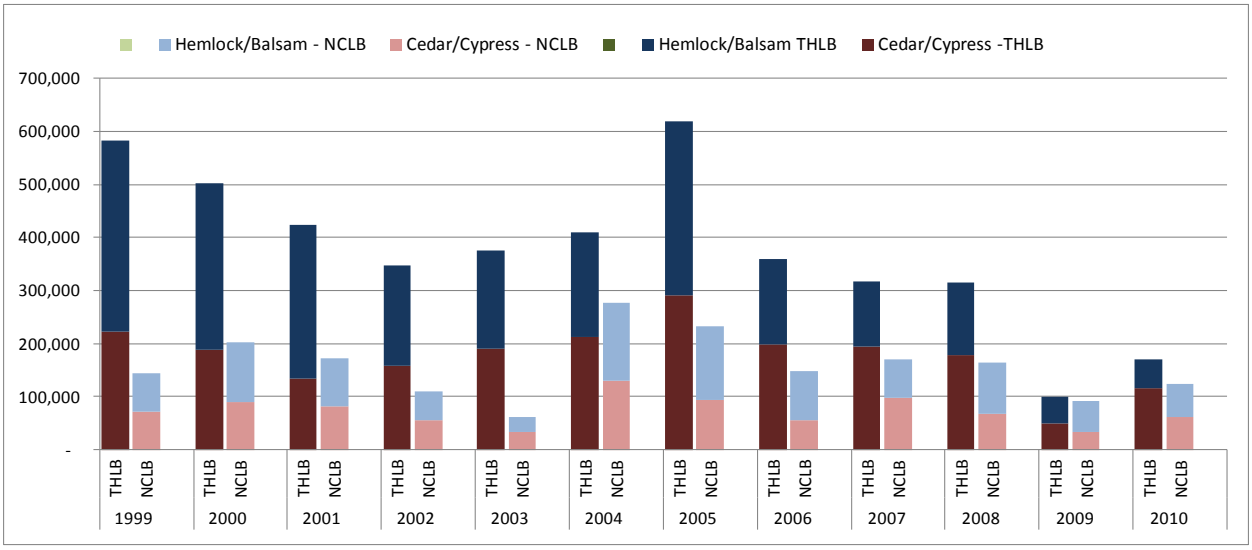


Figure 6. Cutblock inventory volume by THLB class (TSR3) – Mid Coast TSA

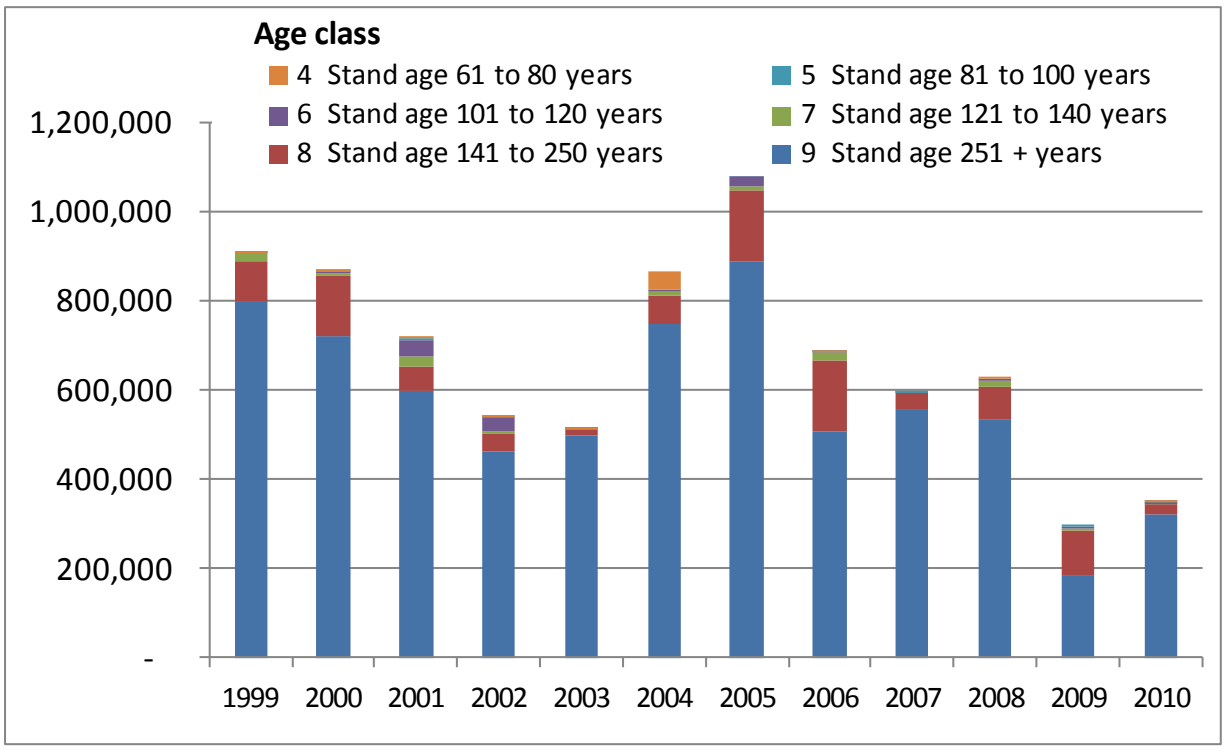


Figure 7. Cutblock inventory volume by Age Class – Mid Coast TSA