

# Forest Trust Land Advisory Committee – April 21<sup>st</sup>, 2017

## State Forests Growth and Yield Modeling Implementation Update

### Project Background:

- Historical difference in how inventory is handled for annual updates to SLI vs. yield tables for modeling purposes.
  - Difference in growth models and calibrations for modeling
- TERG review was for modeling process overall, but several issues specific to growth and yield modeling were identified and presented to the Board (also captured in Record of Decision).
- Because of the confusion created by the annual SLI estimate and the modeling work, ODF decided to address the growth and yield issues first, via a “second party” contract (i.e. active engagement between contractor and Division staff).

### Project Objectives:

- Establish sound and transparent methods to address key aspects of Division G&Y work.
- Unify operational and planning inventory to provide a single annual estimate.
  - Standard reporting (i.e. Annual SLI Report)
  - Starting point for yield tables for modeling going forward.
- Improve institutional knowledge of the inputs into G&Y modeling.
- Derive a single estimate of current inventory that can serve as a benchmark for future updates.
  - Future improvements to methods will be documented along with their relative impact to the inventory estimate.

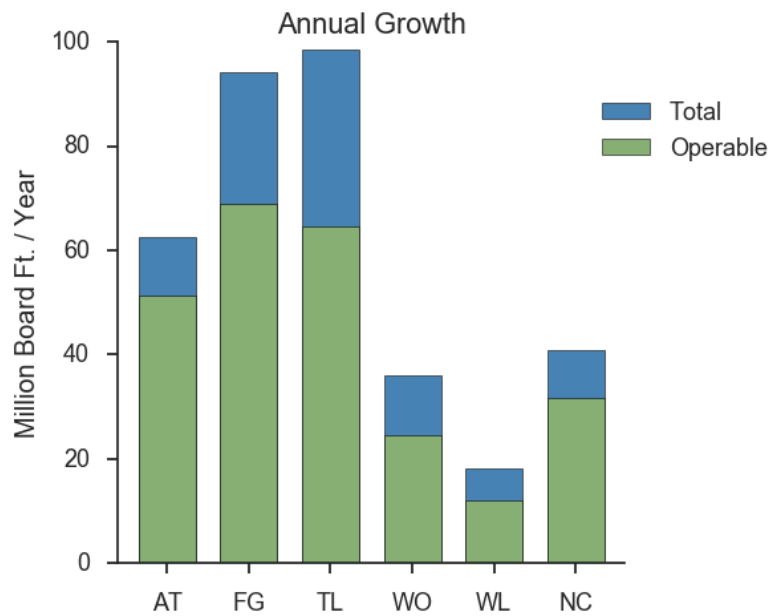
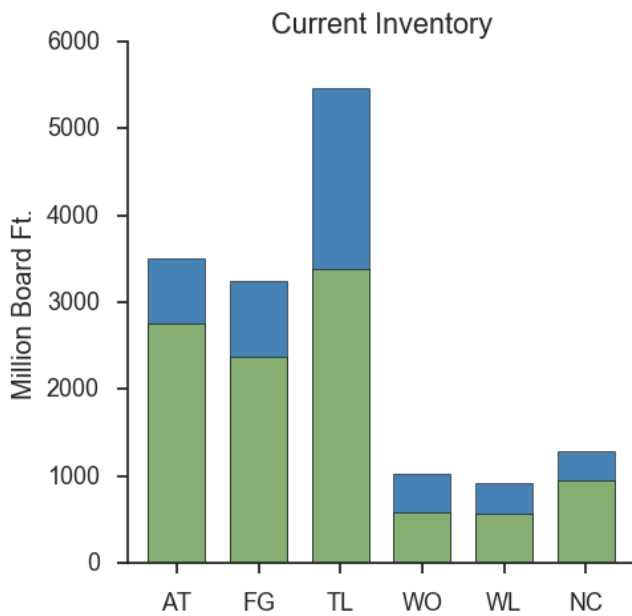
### Key Decisions and Assumptions:

- Division has selected FVS as its growth model going forward.
- G&Y models are developed for broad regional conditions. There is an expectation that users will employ specific calibrations such that projections reflect local conditions.
- Division is leveraging available data and is actively pursuing additional sources of information.
- Division will review and adapt methods as research and information becomes available.
- These revisions will be incorporated in future inventory updates and planning projects.

### Key ESSA recommendations and SF implementation to-date:

- Site Index – Use SLI site tree data where available and implement a model to fill in elsewhere.
  - Stand level site index was calculated using curves compatible with FVS using the recommended methods.
  - Developed a model to predict site index forest wide using soils, historic climate, and topography.
  - Local measured site index was used in FVS projections for stands with appropriate sample trees.
- Tree volume – Use the National Volume Estimator Library (NVEL) and document merchandizing standards.
  - Regionally appropriate taper functions selected: Flewelling and Behre’s
  - Merchandizing specifications: Conifer 40’ log, 8” min DBH, 5” min. top; Hardwood 32’ log, 10” DBH, 6” top
- Basal Area Growth Calibration – Current methods and data are appropriate, but need reanalyzed. Collect more increment data as resources allow.
  - Using the new site index methods and 2001 permanent plot increment core data the district level basal area growth adjustment factors were recalculated.

- Following TERG suggestions statistical significance was tested before including an adjustment in G&Y.
- SF will be seeking opportunities to collect more increment and growth data.
- ❖ Tillamook SNC calibration data has not yet been re-assessed and is not included in this work.
- Maximum Stand Density Index (SDI) – Use SLI data to derive expected maximum stand density limits.
  - Assessed pure stands with  $\geq 80\%$  in a single species, excluded trees  $< 2''$  DBH.
  - An SDI approaching the observed maximum (97<sup>th</sup> percentile) was selected to be the limit passed to FVS.
  - ❖ Revisions to FVS have changed the interactions between SDI and mortality estimates.
- District Review
  - G&Y methods result in considerably different outcomes.
  - Asked field staff to review three alternative estimates on 75 stands.
  - Randomized so foresters did not know the source of the estimates.
  - Used cruise and cut-out data from similar stands, lidar, etc.
  - Based on the review Astoria and Tillamook G&Y will use the previous FVS mortality, all others will use the latest revision to FVS.



District	Acres		Board Foot Volume (mmbf)		Annual Growth (mmbf)	
	Net	Operable	Total	Operable	Total	Operable
Astoria	131,970	105,572	3,500	2,753	62.5	51.2
Forest Grove	111,711	82,972	3,249	2,374	94.2	69.0
North Cascade	46,057	34,605	1,282	946	40.9	31.7
Tillamook	246,264	160,529	5,472	3,379	98.4	64.5
Western Lane	24,702	16,499	914	570	18.2	12.0
West Oregon	35,422	23,133	1,020	577	36.0	24.5
<i>Combined</i>	<i>596,126</i>	<i>423,310</i>	<i>15,437</i>	<i>10,598</i>	<i>350.3</i>	<i>252.8</i>

- ❖ Acres exclude roads
- ❖ SLI Data as of June 2016

Operable acres exclude:

- NSO cores & best habitat
- MMMA
- Steep slopes (public safety)
- Riparian Protections

Operable acres were derived from Alt. FMP project data.