Comparing Land Allocation Model to Previous Modeling Efforts

The State Forests Division has been directed to compare conservation outcomes from a Land Allocation Approach to conservation outcomes from the current NW State Forests Management Plan (FMP). Given a desire to expedite the revision process, the subcommittee has asked if increased conservation can be measured with a comparison of Land Allocation model outputs to outputs from previous modeling efforts. This may prove difficult, due to key differences having to do with:

- Policy Choices – Overarching parameters governing the model.
- Model Methodology – Differences in how specific items are handled in the model.
- Model Data – Simple differences in data that support the model.
- Model Outputs – Outputs that can be used as metrics

The most important differences are summarized below, with a *relative* estimate of their magnitude. For instance, the overall conservation goals of the model runs will have a much higher impact than any specific strategy such as green tree retention.

Policy Choices

While all of the categories listed change the nature of the model, the policy choices function together to optimize value, magnifying potential differences across the landscape.

<u>Geographic Scale</u> (**High Impact)**

Previous modeling efforts have focused on district level goals and outcomes, while the current modeling focuses on the six district planning area as a whole. This gives the current model leeway to make decisions outside the constraints of the previous models. For instance, it may defer harvest over a large portion of one district, and increase harvest on another district to create the best value or volume outcomes. This results in dramatic variation in volume among model periods, by district and county.

<u>Conservation Goal</u> (**High Impact)**

Core conservation objectives of the previous model, most notably a range of Desired Future Forest Condition (DFC), were planned at a district level to be achieved within a targeted range. Conversely, under a Land Allocation approach, the conservation emphasis zone has been delineated at the planning area level, and is not evenly distributed across districts. It is important to note that the conservation zone is primarily composed of areas that are required to meet legal or take avoidance objectives, or are inoperable, and are therefore difficult to change.

<u>Even-Flow Goal</u> (**High Impact)**

Previous models have focused on providing an even-flow of volume for each district, whereas the current model focuses on providing an even-flow of value across the planning area.

<u>Legacy Structures</u> (**Low Impact)**

Previous models have focused on managing legacy structure (i.e. green trees) on the landscape to current FMP standards. The current Land Allocation model uses Forest Practices Act minimum standards for legacy retention in the production emphasis zone.

Attachment A

Model Methodology

Operational Costs (**High Impact)**

Previous model runs focused on harvest costs associated with specific harvest units. The current model takes into account: 1) harvest costs, 2) variable costs associated with activities such as sale layout and reforestation and T&E surveys, and 3) fixed costs associated with overhead and administration that apply to forest management overall. Likewise, the "must pay" rule implemented in previous models only applied to harvest costs, while the current model requires a unit to pay on harvest and variable costs.

Silvicultural Prescriptions (**Moderate Impact)**

The silvicultural prescription sets used in the previous models include pathways specifically targeted toward structure based management stand types. The prescription set in the current model has been simplified, for 2 reasons: 1) structure based management is not the mechanism being used in the model, and 2) many of the previous prescriptions were similar and deemed to be redundant in terms of their potential outcomes.

T&E rules (**Low Impact)**

Model rules pertaining to threatened and endangered species are more nuanced in the current modeling effort than in the past. For instance, in previous modeling efforts, harvest units that contributed to the northern spotted owl take avoidance measures were fixed in time throughout the model. In the current model, they are reassessed during the run, and the model may harvest designated habitat as it is replaced by recruited habitat, so long as it meets requirements around habitat abundance, spatial distribution, and rate of harvest.

Model Data

Starting Inventory (**High Impact)**

The starting point of forest inventory has changed over the course of modeling. All districts have gone through updates and imputation adjustments. One of the most significant differences is a more accurate starting point for Tillamook District, which has a lower percentage of measured stands than other districts. Specifically, the current Tillamook inventory utilizes an enhanced method for imputing data to unmeasured stands, which was done through a specific, targeted project.

Growth and Yield (**High Impact)**

Growth and yield data are different from previous model runs due to improved calibration with district conditions.

Values and Cost Updates (**High Impact)**

Pond values and logging costs have been updated in the current model. While some adjustments seem small, they have a high impact when compounded.

T&E Data Updates (**Low Impact)**

Additional threatened and endangered species sites have become known since previous modeling efforts, some of which may have fallen outside of previously mapped Desired Future Condition complex

stand types. Many of these are marbled murrelet sites, which are more fixed than owl circles. The overall impact to the six district planning area is fairly low, but it is high on specific districts.

Model Outputs

Conservation Outputs (**High Impact)**

Previous models have used complex stand structure (Layered and Older Forest Structure) as a surrogate for habitat. Additionally, those structure categories were based on large trees and the diameter distribution of trees. Specific habitat structures, like green trees, snags and downed wood were not available. As a result, the habitat outcomes of the previous efforts were overly broad, and did not speak to conservation outside of those stand types. The current Land Allocation model efforts to date have not reported these habitat structures, either, but this is a model improvement that is being made in the near future.

Attachment A

Category	Difference	Previous Models	Land Allocation Model	Magnitude
Policy	Geographic Scale	Individual district	6 District Planning Area	High
	Conservation Goal	Desired Future Condition	Conservation Zone	High
	Even-Flow Goal	Even-Flow Volume	Even-Flow Value	High
	Legacy Structures	Modeled at FMP	Modeled at FPA	Low
Model Methodology	Operational Costs	Harvest Costs	Harvest, Fixed and Variable Costs	High
	Silvicultural Prescriptions	Large number of prescription pathways to create stand structure	Fewer prescription pathways	Moderate
	T&E Rules	Fixed owl harvest units for entire model run	Owl habitat polygons changed during model run	Low
Model Data	Starting Inventory	Based on SLI	Updated SLI, with key improvement in Tillamook Imputation	High
	Growth and Yield		Updated growth	High
	Value and Cost Updates		Updated from previous	High
	T&E Data		Updated from previous	Low
Model Outputs	Habitat metrics	Stand Structure only	Key habitat components	High

Summary

One of the goals of revising the current forest management plan is to improve conservation outcomes. A potential tool for quantifying conservation outcomes is to compare Land Allocation model outputs to outputs from previous models. There are sufficient differences in policy choices, modeling methodology, model data, and model outputs as to severely limit the utility of this comparison.

However, short of model outcomes, the division has compared green tree retention, snags, and down wood strategies using a FPA approach as compared to an FMP approach. Likewise, comparisons between FPA and FMP riparian strategies are provided. These comparison don't use model outputs but rather the quantity, distribution, and function of wildlife and aquatic strategies. These topics are addressed in the following papers.