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## CONTEXT

At the November 2018 Board of Forestry (Board) meeting, the Board asked the State Forests Division (Division) for the following information:

1. A characterization of barriers in the current plan and how proposed changes are intended to address the Board direction to improve financial and conservation outcomes in a revised Forest Management Plan;
2. A description of the overarching vision for a revised Forest Management Plan proposed; and
3. An update on State Forests Division financial metrics and Forest Development Fund balance.

## BACKGROUND AND ANALYSIS

As part of the process to develop a revised Forest Management Plan (FMP) the Board adopted a set of Guiding Principles (July 2018 Board meeting) and reviewed an initial set of Draft Goals, Strategies, and Measurable Outcomes (November 2018 Board meeting). This document presents the barriers to improving conservation and financial outcomes in the current FMP, and an overarching vision for a revised FMP.

### *Current Northwest Oregon State Forests FMP (revised 2010)*

The Northwest Oregon State Forests FMP is based on a management approach termed Structure-Based Management (SBM), defined as: “the application of silvicultural tools in a manner that is designed to attain a desired landscape condition, which in turn will meet the land management objectives of the FMP. Specifically, it is designed to produce and maintain an array of forest stand structures across the landscape in a functional arrangement that provides for the social, economic, and environmental benefits called for in the management direction for these lands. These benefits include a high level of sustainable timber and revenue, diverse habitats for indigenous species, a landscape level contribution to properly functioning aquatic systems, and a forest that provides for diverse recreational opportunities.” The four key concepts that provide the foundation to SBM are:

1. Active management for a diverse array of forest stand types;
2. Landscape design to provide for a functional arrangement of the stand types in terms of habitat values;
3. Active management to provide for key structural components within stands and on the landscape (snags, down wood, legacy trees, etc.); and
4. Active management for social and economic benefits.

The anticipated result of using SBM is to actively develop a diverse “forest landscape that more closely emulates historic variability and diversity in a much shorter time frame than if these existing stands were left to develop through natural influences.”

Individual stand management varies with SBM. Some stands are managed along pathways that focus on timber production, with habitat structures such as snags and down wood incorporated to maintain key elements of wildlife habitat. Other stands are managed to emulate habitat conditions normally associated with older forests while continuing to produce high volumes of timber from silvicultural treatments.

Over the long-term, many stands move through the entire management pathway and return to a regeneration stand type through a final harvest. When the desired future condition is achieved, the landscape is a dynamic mosaic of slowly shifting stand types, but with relatively stable quantities of each. Embedded within the mosaic is a network of areas that develop into older forest conditions and persist in a relatively unmanaged state.

Through implementing the current FMP, ODF has gained considerable insight into the factors that influence financial viability for the State Forests Division. Division expenditures to fully implement the current FMP and its adaptive management process were increasing prior to the last recession. As the recession began to affect timber markets, it became clear it would be difficult to stretch financial resources to provide the necessary services to achieve full implementation.

The Division’s financial viability is affected by several factors not directly related to the FMP. First, there are significant issues with the State Forests landbase (e.g. large burned-over areas that have lower productivity than initially projected when developing the current FMP). Second, external conditions have a considerable influence on available funding (e.g. timber market cycles vary significantly over time, and market swings are difficult to anticipate). Other issues arise from high expectations for public forests in terms of conservation, harvest levels, and public services such as recreation and education. ODF allocates 63.75% of timber sale revenue to counties for local services. Over the past two years, with a rebounding timber market and business improvements, the Division’s financial status has improved. However, financial viability is a long-term endeavor and there are significant financial challenges to fully implementing the current FMP under the current funding structure.

The next section identifies aspects of the FMP that are barriers to achieving the intended financial and conservation outcomes. It is important to note that the current FMP was constructed assuming the assurances and flexibility associated with a Habitat Conservation Plan (HCP).

### **Barriers to Success of the Current FMP**

The foundational aspects of the current FMP are not barriers to success in themselves. Goals to produce an array of habitat structures across the landscape and to protect, maintain, and restore aquatic and terrestrial habitat are fundamental tenets. These goals are consistent with State Forests’ legal mandates. The expected outcome of the FMP is to achieve wildlife habitat goals through SBM and produce significant and sustainable harvest levels that meet economic outcomes for counties, schools, and local taxing districts.

After 18 years of implementing the FMP, some SBM aspects have been challenging to implement, ineffective at achieving expected conservation outcomes, or financially unsustainable. In some districts, silvicultural pathways available to achieve the desired “array of forest stand structures” do not achieve expected results due to local landscape conditions. In contrast with conservation outcomes, the FMP does not explicitly address timber harvest goals or strategies. The plan calls for active management for social and economic benefits, but does not differentiate between active management for creating structure and active management for economic benefits. In some geographic areas, timber management costs exceed revenues to the Division, and specific silvicultural practices required for managing for older forest or layered forest conditions (complex structure) can be prohibitively expensive. An improved understanding of costs versus timber revenues has demonstrated the challenge in providing sufficient funding for full FMP implementation.

The State Forests Division has identified several FMP elements that create barriers to improving financial and conservation outcomes. What follows is a brief discussion of each, along with proposed changes intended to reduce or eliminate the barrier.

1. *Guiding principles, goals, and strategies that address climate change improve conservation outcomes over the long-term.* Awareness of and focus on climate change has increased in the years following the adoption of the 2010 FMP, therefore it will be addressed more adequately in the proposed plan. Drought, changing fire regimes, forest health issues, and other undesirable ecological conditions can be exacerbated by climate change. It is likely that long-term outcomes may not meet expectations if the effects of climate change are not integrated into the FMP. A plan revision that incorporates climate change principles can better address possibilities for catastrophic failures (e.g. reforestation, fire, disease), durability of sensitive areas, and carbon storage. Integrating projected impacts of climate change and planning for adaptation and mitigation efforts is the best strategy for maintaining the long-term productivity of Oregon’s forests and certainty in long-term financial outcomes. It will also improve conservation outcomes through development of resilient, healthy forests. An adaptive management approach will provide information essential for developing effective strategies to achieve desired outcomes.
2. *Establish harvest goals in conjunction with habitat goals to transparently address tradeoffs.* A lack of clarity between competing objectives creates ambiguity and does not clearly describe trade-offs between financial and conservation goals. The FMP focuses on creating complex structure and does not include a set of goals, strategies and measurable outcomes that guide harvest decisions. Including harvest goals and strategies can inform decisions on balancing conservation and financial outcomes. This change may increase financial outcomes in some areas and conservation outcomes in others.
3. *Manage for a continuum of forest conditions associated with seral stages rather than discrete structure types to better reflect forest conditions and provide silvicultural flexibility.* The current FMP identifies five distinct stand structure categories. Stands either meet the criteria for a structure category or not, which ignores the continual development of habitat and structural characteristics over time and the complex ways in which structural elements are distributed on the landscape. In reality, there is a continuum of conditions for stand age, vegetative diversity and complexity, elevation, aspect, and other characteristics.

Discrete definitions for complex structure (coupled with expectations to achieve the condition rapidly) can lead to silvicultural approaches that do not effectively achieve desired

conservation outcomes on the landscape in a meaningful timeframe. Desired structure that meets the pre-defined stand type criteria is often not achievable in an expedited timeframe. Expediting layered forest conditions tends to be more successful in the hemlock zone. However, even in the hemlock zone, a thick understory of naturally regenerated hemlock requires repeated thinning treatments representing significant financial investment. In other instances, under-planted red cedar, which is a shade-tolerant species, in both the West Oregon and North Cascade Districts has resulted in seedlings with little growth in 15-25 years. In the Douglas-fir zone, silvicultural techniques to create layered stands have primarily resulted in thick ground cover of salal and sword fern. Such results are not effective in achieving conservation objectives in a shorter timeframe than if left unmanaged.

Silvicultural tools intended to achieve structure types are costly to implement and can produce lower volume than traditional, even-age forest management tools. At smaller scales, this may not present significant financial constraints. However, at the landscape scale, costs may compound to result in lower financial performance, particularly when compared to more traditional management practices.

Shifting from discrete structure categories to goals based on habitat definitions, seral stages and specific habitat components (e.g. snags, downed wood, herbaceous vegetation) better reflects the continuum of forest conditions. A more complete accounting of forest conditions allows for better accounting of habitat values and avoids implementing management activities designed to fit a narrowly defined complex structure definition. This change is expected to increase financial outcomes in some areas and conservation outcomes in others. The seral stage approach will provide for greater flexibility in the use of silvicultural tools and pathways increasing both conservation and financial outcomes.

4. *Use of regional habitat goals that consider habitat on adjacent land ownerships will improve both conservation and financial outcomes.* The plan sets targets for structure types at the district level. The portion of the landscape targeted for complex structure creates constraints on revenue-generating activities. This is particularly true if there is poor geographic overlap of areas targeted for complex structure and areas established as durable conservation areas such as northern spotted owl and marbled murrelet management areas.

Structure targets are especially challenging in smaller districts or when State Forests' ownership parcels are scattered. The targets result in a relatively larger operational impact than for larger districts. In these districts, habitat goals may best be achieved by considering habitat arrangements that complement habitat adjacent to state forests. For example, large patches of adjacent older habitat may benefit from early seral diversity on neighboring state forests, and smaller patches of adjacent older forest habitat may benefit from late seral habitat being provided on state forests.

Using a regional approach to achieve a range of habitat conditions and conservation outcomes can increase financial outcomes by reducing costs and inefficiencies resulting from the uniform allocation of rigid structure targets. The goal of managing for a functional landscape will not change, so a minimal effect on conservation outcomes is expected.

5. *Large areas of the landscape require a restoration focus with strategies that aren't well-suited to SBM.* For example, the Tillamook District has multiple challenges that limit management strategies and financial outcomes:

- Over half of the district has slopes that exceed 60%, which increases harvest cost.
- Historic wildfires have impacted soil productivity.
- Large areas of underproductive hardwood stands and areas affected by Swiss Needle Cast.
- For areas in the district unaffected by historic wildfire, there are significant areas inhabited by marbled murrelets and northern spotted owls.

This proposed plan emphasizes reinvestment in the forest, which would include a balanced approach that improves both conservation and financial outcomes through active management. This approach would also allow for improved restoration outcomes in the Tillamook District.

6. *Moving from a shifting mosaic to the use of durable conservation areas, goals for a range of seral stages, and strategies to maintain connectivity will improve financial outcomes while maintaining conservation outcomes.* The plan describes a “dynamic mosaic of slowly shifting stand types.” This concept of a shifting mosaic assumes that areas in an older forest condition can be harvested as new stands with older forest conditions come on-line in other parts of the landscape. This concept may work when coupled with an HCP because an HCP allows for “incidental take” of federally listed species. State forest lands are currently managed under take avoidance, with areas occupied by federally listed species fixed on the landscape with little to no opportunity for harvesting the associated complex stands. This effectively prevents the ability to plan for and achieve a shifting mosaic.

Additionally, in order to maintain dynamic-steady state that maintains a percentage of the forest in a discrete structure type in perpetuity, a larger percent of the forest must be in that structure type in order for the shift to occur. That is, if the minimum target for complex structure is 30%, there must be more than 30% of the landscape in complex structure before complex stands can be harvested. The lack of an HCP and the dynamic steady-state constraints means that more of the landscape is managed for older forest conditions than was contemplated in the plan. This contributes to financial viability challenges.

Removing the shifting mosaic concept is expected to improve financial outcomes while also creating durable conservation areas on the landscape. This change will also enhance communications and expectations with regard to the management of state forest lands. This change does not mean that stands in conservation areas will never be replaced or augmented by new habitat, just that there will be no requirement for a shifting mosaic.

7. *Including measurable outcomes provides clear adaptive management framework.* Standards currently contained in the FMP lack measurable outcomes, resulting in a focus on the input for management rather than the outcome of management. This can result in delays in applying adaptive management, reduce flexibility to address unique situations, and limit outcomes where trade-offs may exist. Moving to evaluation of plan goals through outcomes rather than prescribed inputs will improve the ability of the Division to use monitoring and adaptive management to achieve GPV. This change is expected to improve both conservation and financial outcomes, by increasing the focus on outcomes and allowing for increased flexibility to address unique situations or new information. It also establishes a clear mechanism and set of metrics to inform the public and the Board on plan performance.

## **Vision for the Revised Forest Management Plan**

Within the context of a working forest landscape, state forests provide benefits to all Oregonians. Proper forest stewardship provides revenue to counties, rural communities and the agency, creates jobs, supports resilient forest ecosystems, provides high quality habitats for native fish and wildlife, clean air and high water quality, and educational and recreational opportunities. These economic, environmental, and social benefits are codified in the Greatest Permanent Value (GPV) mandate.

A high-level overarching vision for a revised FMP is articulated below. Much of the foundational aspects of the current plan remain unchanged. The four key concepts in the current plan remain in place for the revised FMP. They are:

1. Active management for a diverse array of forest stand types;
2. Landscape design to provide for a functional arrangement of the stand types in terms of habitat values;
3. Active management to provide for key structural components within stands and on the landscape (snags, down wood, legacy trees, etc.); and
4. Active management for social and economic benefits.

The revised FMP incorporates additional concepts:

5. Active management to produce sustainable harvest and flow of revenue
6. Active and passive management to protect, maintain, enhance and restore properly functioning aquatic ecosystems; and
7. Active and passive management to address current and potential future effects of climate change on forest health and productivity, and habitat for native fish and wildlife.

At a high-level the vision for the plan is the same as the current plan: “Specifically, it is designed to produce and maintain an array of forest stand structures across the landscape in a functional arrangement that provides for the social, economic, and environmental benefits called for in the management direction for these lands. These benefits include a high level of sustainable timber and revenue, diverse habitats for indigenous species, a landscape level contribution to properly functioning aquatic systems, and a forest that provides for diverse recreational opportunities.”

The proposed revision maintains the Division’s current approach of integrated forest management. Upland forest management activities are carried out in concert with durable conservation areas and site-specific conservation measures to achieve GPV. Monitoring and adaptive management provide feedback loops to managers and policy-makers to determine if changes are warranted to better meet resource management goals articulated in the FMP.

### *Implementation*

Management goals and strategies are integrated in recognition of the linkages between ecosystem processes. Management and conservation objectives are not exclusive, and strategies are implemented to achieve multiple objectives at both the landscape and site-specific scales.

### *Harvest Activities*

Forest uplands are managed to achieve sustainable harvest objectives and provide a range of forest and habitat conditions. Harvest and conservation objectives are balanced through a combination of upland management activities, including young stand management, commercial thinning and modified clear cut operations, durable conservation areas, and site-specific conservation strategies. Silvicultural practices utilize a combination of approaches including rotation age, culmination of mean annual increment, or a focus on restoration, as appropriate.

In durable conservation areas (described below), management activities focus on habitat development that promotes and maintains older forest conditions and habitat complexity. The remainder of the landscape is managed to create a range of seral conditions that enhance benefits of the durable conservation areas and contribute to financial viability. The distribution of age classes results in a mix of early, mid, and late seral conditions. These different seral stages provide variable forest conditions promoting a diverse array of habitat for wildlife. Decadal forest harvest planning integrates goals for landscape function with management prescriptions.

Given the current age distribution, achieving a balanced range of age classes requires a long-term departure from the current strategy of non-declining even-flow of timber harvest. This departure is implemented over multiple decades, and will require integration with adaptive management to ensure a balance between financial viability and conservation outcomes.

#### *Road Construction and Maintenance*

Roads are constructed and maintained to meet all forest management needs, including public use in many areas, while avoiding detrimental effects on aquatic and terrestrial resources and interactions with landslide processes.

#### *Forest Restoration*

Forest harvest prescriptions are implemented to restore diseased, poorly stocked stands that do not contribute to conservation or financial outcomes. Examples include impacts of Swiss Needle Cast and vast acreages of aging red alder. In many of these instances, costs may outweigh revenues in the near-term, but the restoration investment will have positive long-term financial or conservation outcomes. Alternatively, in specific situations where complex early seral habitat is a desired outcome, the tree component of a stand may be allowed to naturally senesce.

#### *Conservation Commitments*

Throughout the landscape a network of durable conservation areas are designed to restore or enhance habitat. Management prioritizes the development of complex older forest conditions that persist on the landscape for long periods of time and eventually become old-growth stands with natural disturbance patterns. Retention of green trees, snags and downed wood conserve legacy structure and provide short- and long-term conservation benefits in young stands. Young stands are managed to create diverse early seral structure.

- Durable Conservation Areas. Older forest conditions develop in durable locations associated with T&E sites (e.g. marbled murrelets and northern spotted owls), riparian areas, protection of steep slopes and debris flow prone locations.
- Maintain Old Growth<sup>1</sup>. Individual old growth trees or stands are not harvested. Stands in durable conservation areas develop into old growth forests.
- Species of Concern Areas. Species of Concern (SOC) areas are strategically distributed across the landscape to maintain and enhance habitat connectivity, provide interior habitat,

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<sup>1</sup> Typical characteristics of old growth include: a moderate to high canopy closure; a patchy, multilayered, multispecies canopy with trees of several age classes, but dominated by large overstory trees with a high incidence of large living trees, some with broken tops and other indications of old and decaying wood; numerous large, standing dead trees (snags); heavy accumulations of down woody debris; and the presence of species and functional processes that are representative of the potential natural community. In western Oregon, old-growth characteristics begin to appear in unmanaged forests at 175 to 250 years of age.

and contribute to landscape heterogeneity. Specific management activities vary with landscape and stand-scale objectives.

- Complex Early Seral Stands. Complex early seral stands tend to support a particularly high abundance and diversity of deciduous trees and understory shrubs and forbs. These stands are high in conservation value and provide habitat for a variety of species. Reforesting with a range of tree species and using silvicultural treatments that maintain diversity during early stand development, create complex early seral conditions and long-term overstory diversity. The diverse vegetation in young stands combined with retention of legacy structures such as snags, green trees, and downed wood provide habitat that promotes a high level of species richness.
- Site-specific Strategies. Establishing no-cut buffers around streams and wetlands, retaining green trees, snags, and downed wood contribute to conservation in young stands and protect and restore properly functioning<sup>2</sup> habitat for aquatic and terrestrial resources.
- Restoration. Rehabilitation and restoration of terrestrial and aquatic habitat include rehabilitating Swiss Needle Cast stands and addressing large expanses of aging red alder. Habitat improvements for native aquatic species focus on enhancing or restoring riparian function, increasing instream wood, and restoring fish passage.

### *Climate Change*

Known impacts of climate change are addressed during implementation of forest management and conservation strategies. The effects of climate change are addressed with a proactive approach and in an adaptive management context. Research findings and tools are used to adapt and implement strategies that can protect or restore areas from the effects of climate change. Examples follow.

- Forest Conditions and Silvicultural Decisions. Management may focus on creating resilient forests in stands currently stressed by drought condition. While management may not produce a positive financial outcome, it may be more important in the context of forest health and climate change.
- Reforestation Decisions. Reforestation practices will be based on achieving the desired future condition. The majority of reforestation activities use improved seed shown to have desired growth characteristics for the planting site. The division will continue to monitor research regarding climate change and will incorporate new research into future planting plans.

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<sup>2</sup> In determining what constitutes “properly functioning aquatic systems,” the overall approach is based on the following key concepts:

- Native aquatic species have co-evolved with the forest ecosystems in western Oregon.
- High quality aquatic habitats result from the interaction of many processes, some of which have been greatly influenced by human activity.
- Aquatic habitats are dynamic and variable in quality for specific species, through time and across the landscape.
- No single habitat condition constitutes a “properly functioning” condition. Rather, providing diverse aquatic and riparian conditions over time and space would more closely emulate the natural disturbance regimes under which native species evolved.



- Climate Refugia. Upland and aquatic climate and temperature refugia are established and maintained. Refugia locations, conditions, and strategies are informed by contemporary research and monitoring data.
- Aquatic Resources. Contemporary tools determine portions of the stream network that are more sensitive to climate change and implement alternative buffer strategies in an adaptive management context. An example is to implement differing riparian buffers in an applied experimental design. Findings will be used to adjust how riparian buffers are implemented.

### *Recreation and Education*

Popularity of specific recreation activities change over time, reflecting changes in user demographics, technology, the economy and outdoor recreation trends. As participation in outdoor recreation grows, the positive economic impacts at the local and state levels are evident. When recreational use is not managed, forest resources are often negatively impacted. Education and interpretation programs encourage learning about State Forests' history and management.

- Integrated annual and decadal planning aligns harvest operations with recreational services and minimizes negative impacts on users or enhance user experiences.
- Forest recreational facilities and activities are planned and maintained to minimize impacts on terrestrial and aquatic habitat.
- Forest education programs highlight the integrated approach, forest stewardship principles, natural resources, and public benefits provided from maintaining working forests.

### *Adaptive Management*

The purpose of adaptive management is to inform management by formally addressing uncertainties while allowing management activities to take place. It serves as a mechanism to implement management in a manner that increases understanding of forest management and conditions, which in turn is used to reduce future risk. An adaptive management process is used to determine if the strategies are being implemented and are having the desired outcomes. Findings are used to report outcomes to the Board and adjust how the FMP is being implemented. The FMP is revised if findings suggest there is a need to change plan goals or strategies contained in the FMP.

- A small set of performance measures (9-10) are reported to the Board to demonstrate if strategies achieve desired outcomes. Reporting frequency will depend on the metric.
- Monitoring questions are prioritized to examine management strategies that have the greatest uncertainty or potential effects on FMP goals and outcomes.
- Forest inventory provides data across all State Forests lands for long-term planning purposes and targeted inventory sampling is used for harvest planning and stand assessments. Inventory data support information needs such as habitat characteristics, forest health, and seral stage distribution.

### *Summary*

State forests are working forests with a mandate to manage for a wide range of values. An integrated FMP considers multiple objectives when implementing management activities. The range of harvest strategies, and landscape and site-specific conservation strategies are merged when planning and implementing forest management activities to achieve stated desired outcomes. Public use and recreation are woven into the working forest landscape to maintain safe and enjoyable experiences. A plan that allows for sufficient flexibility coupled with a robust adaptive management foundation, can result in timely responses and adjustments as new information becomes available.

### **State Forests Financial Metrics**

The Fall 2018 Revenue Projection continues to be positive with revenues exceeding costs. The positive Net Operating Income (NOI) trend is projected to continue for three more years, until 2022. The Forest Development Fund balance is expected to increase over this time.

The State Forests Division has implemented many operational improvements to help control costs and increase revenue. This includes a focus on high net revenue timber sales that do not detract from other management goals. Other outside influences of favorable market conditions has led to high stumpage prices and purchasers harvesting sales quickly, which also contributes to the near-term positive NOI. Current prosperous market conditions are cyclic and have already started to decline. The Division remains committed to continual business improvement, pursuing a revised Forest Management Plan and making strategic investments that enhance Greatest Permanent Value, and help ensure revenues exceed expenses over the long-term.

### **RECOMMENDATION**

Information only.

### **NEXT STEPS**

The Division will return in April 2019 with an update on the FMP and HCP projects.

### **ATTACHMENTS**

1. State Forests Financial Metrics and Forest Development Fund Balance