

Key Working Hypotheses, Assumptions, and Monitoring Questions: NW FMP Excerpts

Chapter 3 of the NW FMP presents the guiding principles, forest vision, and resource management goals, which set the overall direction for the management plan. This chapter also presents the working hypotheses that lead us to believe that we can indeed achieve the future vision and resource goals. *At the very heart of this plan, and fundamental to the adaptive management program is a set of working hypotheses.* These working hypotheses relate to broader assumptions or beliefs that, if validated over time, lead us to believe that we can indeed achieve the future vision and thus the benefits that accrue from that future forest.

These key working hypotheses are (from pp.3-18—3-19):

- The citizens of Oregon will continue to support integrated and active management of state forests in northwest Oregon to provide for multiple outputs and benefits.
- An active and integrated forest management approach will provide for high levels of sustainable and predictable timber and revenue while concurrently providing habitat for native fish and wildlife species.
- Identification and protection of key habitat areas for specific species will maintain existing populations as a source to colonize new habitat.
- Species will colonize new habitat as it develops over the longer term.
- A diverse array of stand types will, at various times, provide for achievement of all the resource goals outlined in the previous section of this plan.
- Providing for biodiversity at the landscape level requires providing for an array of forest conditions through time and space that emulates conditions created by historic disturbance regimes.
- Providing for a diverse array of forest conditions through time can be accomplished in a managed context through the application of silvicultural principles.
- A diverse array of forest conditions will enhance overall forest health and reduce the risks of catastrophic loss from insects and disease.
- Active management through a combination of landscape-level strategies and site-specific standards will result in maintaining and restoring properly functioning aquatic and riparian habitats.
- Timber markets will exist over time for the range of timber types and qualities that will be produced from state forests. The diverse “portfolio” of products available from a diverse array of stand structures will strengthen the ability of state forests to capitalize on changing markets.
- A diverse array of forest conditions will provide diverse recreational opportunities on these state forest lands.
- Long-term management of natural resources can only succeed within a framework that provides for change.

Collectively, these working hypotheses form the basis for the set of integrated forest management strategies described in the Chapter 4. They also provide the foundation for the key questions that must be explored through time, as this plan is implemented, to assure that change occurs in an appropriate and timely manner.

Chapter 4 of the FMP then presents the resource management concepts and strategies for a broad, integrated management approach to be implemented on northwest Oregon state forests. *These strategies are the heart of the FMP and provide the direction for achieving the goals and vision that were outlined in Chapter 3.* Chapter 4 describes the integrated forest management strategies, which are the basis for managing the forest landscape as a whole, and additional fine-filter strategies for species of concern such as spotted owls and marbled murrelets. These FMP strategies fall under four general categories of:

- (1) Landscape Management Strategies
- (2) Aquatic and Riparian Strategies
- (3) Forest Health Strategies
- (4) Species of Concern

Each of these sets of strategies included a list of “key working hypotheses” and “key assumptions/questions to be addressed through monitoring”, which are as follows:

(1) Adaptive Management Measures for Landscape Management Strategies (from pp. 4-57—4-58)

Key Working Hypotheses:

- An active and integrated forest management approach will provide for high levels of sustainable and predictable timber and revenue while concurrently providing habitat for native fish and wildlife species.
- Providing for biodiversity at the landscape level requires providing for an array of forest conditions through time and space that emulates conditions created by historic disturbance regimes.
- Providing for a diverse array of forest conditions through time can be accomplished in a managed context through the application of silvicultural principles.
- Timber markets will exist over time for the range of timber types and qualities that will be produced from state forests. The diverse “portfolio” of products available from a diverse array of stand structures will strengthen the ability of state forests to capitalize on changing markets.
- A diverse array of forest conditions will provide diverse recreational opportunities on these state forest lands.

Key Assumptions/Questions to be Addressed through Monitoring:

- There is a predictable relationship between forest stand structure and habitat requirements of native species.
- Active silvicultural management can accelerate the development of more complex stand structures.
- Active silvicultural management towards more complex stand structures can produce high levels of sustainable timber and revenues from forest operations.
- Older forest structure stands will provide habitat for native species that is similar in function to that provided by old growth forests.
- Multi-layered stand canopies are a measure of structural diversity that supports more complex plant and animal communities than stands that are not layered.
- A diversity of stand structures will provide for a broad range of biodiversity and a range of habitats for native species.

- The identified array of forest stand types (the desired future condition) provides the necessary quantity and arrangement of habitats to provide for native species.
- A diversity of stand structures will provide for diverse recreational opportunities and activities over time throughout the forest.
- Over the long term, the stand types can achieve the goals through a dynamic mosaic that shifts slowly across the landscape.

(2) Adaptive Management Measures for Aquatic and Riparian Strategies (from p.4-76)

Key Working Hypothesis:

- Active management through a combination of landscape level strategies and site specific standards will result in maintaining and restoring properly functioning aquatic and riparian habitats.

Key Assumptions/Questions to be Addressed through Monitoring:

- Aquatic and riparian systems in the planning area were historically subjected to random disturbance events at a variety of scales that resulted in a wide range of riparian stand conditions adjacent to aquatic areas at any given point in time.
- The combination of the landscape management strategies and the aquatic and riparian strategies will provide an array and frequency of riparian stand conditions across the landscape through time that provides for properly functioning conditions.
- In riparian areas where mature forest condition is the desired future condition, and young stands currently predominate, active management is more likely to restore properly functioning conditions in a timely manner than more passive approaches.
- Active management of stands in riparian areas will supplement natural elements, particularly large woody debris, that are lacking due to previous disturbance events, and/or management activities.
- Compliance with management standards for forest road design, construction, improvement and maintenance will minimize road-related landslides and sediment loading to streams.
- Application of the three level hazard and risk evaluation process described, will minimize the occurrence of management related landslides, and restore properly functioning conditions in relation to natural landslide events.

(3) Adaptive Management Measures for Forest Health Strategies (from p. 4-80)

Key Working Hypothesis:

- A diverse array of forest conditions will enhance overall forest health and reduce the risks of catastrophic loss from insects and disease.

Key Assumptions/Questions to be Addressed through Monitoring:

- Implementation of the forest health strategies will keep the effects of pests and pathogens to acceptable levels, while recognizing that these levels will vary over time and space as objectives and constraints change.
- High biodiversity provides stability and resiliency to the forest, especially with regard to pests. Active management can promote tree vigor, encourage high biodiversity, and provide long-term productivity.
- Dense stands of single tree species provide conditions that favor rapid spread of root and foliage diseases and other pest-caused damage. Thinning of stands can promote vigorous growth, allows

selection of tolerant or resistant species or genotypes, and may limit spread of certain pests and pathogens.

- Thinning, selective harvesting, interplanting, and underplanting can increase the proportion of pest-tolerant or -resistant species in a stand.
- Different stand structures will influence occurrence and distribution of pests and pathogens. Active management will allow forest managers to take advantage of these natural processes.
- Planting seedlings that are well-adapted to the specific site are less susceptible to damage by pests and pathogens than are seedlings from an inappropriate seed source.
- Timely harvest of dead, dying, or diseased trees will reduce the spread of some pests and pathogens.
- Limiting mechanical injury to trees will minimize the occurrence of stem decay and other diseases.
- Limiting disturbance of soils during harvest will minimize stress of trees which, in turn, will minimize their susceptibility to pests and pathogens.
- Long-term monitoring of the extent, distribution, and severity of disease and pest damage will allow forest managers to evaluate the effectiveness of management and to determine necessary adjustments in management practices.

(4) Adaptive Management Measures for Species of Concern Strategies (from p. 4-84)

Key Working Hypotheses:

- Identification and protection of key habitat areas for specific species will maintain existing populations as a source to colonize new habitat.
- Species will colonize new habitat as it develops over the longer term.

Key Assumptions/Questions to be Addressed through Monitoring:

- Landscape strategies provide additional habitat on the landscape for species of concern.
 - Active silvicultural management can accelerate development of habitat suitability compared to passive management.
 - There is a predictable relationship between stand structure and habitat requirements for species of concern.
- Landscape management and design strategies allow species that colonize new habitats to become firmly established and to occupy the new territories for long periods.
- Species of concern in newly developing habitats will successfully reproduce.
- Connectivity of habitats across the landscape is provided by the landscape strategies.
 - Large, extensive areas of the landscape are not maintained in forest conditions that could be obstacles to species dispersal.
 - Higher quality habitats are well-distributed across the landscape, including representation in areas otherwise dominated by lower-quality conditions.

Management actions will not result in extirpation of species of concern in any portion of the planning area.

Chapter 5 then describes guidance and standards for processes and activities that will be undertaken to implement the FMP strategies, and includes guidelines for monitoring and adaptive management that are designed to evaluate the working hypotheses and key assumptions/questions over time. Monitoring is an important step in the adaptive management process and is, therefore, a key element in the FMP. One of the guiding principles of the FMP commits the Department of Forestry to using an adaptive management approach, with monitoring and research as part of that approach. Over time, monitoring and research will indicate the extent to which the assumptions underlying the strategies are correct and if the strategies are

accomplishing their intended purpose. As monitoring provides feedback, it is intended for the FMP to be improved through adaptive management.

Monitoring Framework—

Information from monitoring and research will be planned for and used to assess the following items:

- *Assumptions and hypotheses* —Are the basic assumptions and hypotheses that support the strategies scientifically valid? (See Chapter 4. Also compare the summary of working hypotheses in Chapter 3, page 3-18.)
- *Resource condition* —Can historic and current conditions serve as a basis for estimating desired future conditions and likely trajectories of changes in resources?
- *Ecological/cultural trends* —Are resources changing due to ecological, social, political, and economic influences outside the scope of the plan's management actions?
- *Management actions* —How are the plan's strategies being implemented?
- *Management effects* —How are the resources changing in response to management actions?

These questions serve as the basis for developing specific monitoring projects or research needs. As information becomes available from the monitoring program, as well as from researchers and others working on forest management issues, it will be evaluated to determine additional information needs and necessary changes to the management strategies.

Key Questions—

The Department of Forestry will conduct implementation, effectiveness, and validation monitoring. Implementation and effectiveness monitoring will concentrate on a series of key questions:

- Does the FMP provide for healthy, productive, and sustainable forest ecosystems that over time and across landscapes provide a full range of social, economic, and environmental benefits to the people of Oregon?
- Does the FMP maintain and restore properly functioning aquatic and riparian habitats?
- Does the FMP protect, maintain, and enhance native wildlife habitats, recognizing that forests are dynamic and that the quantity and quality of habitats for species will change across landscapes and over time?
- Does the FMP provide sustainable timber harvest?
- Does the FMP provide for healthy forests by managing forest insects and diseases and by using appropriate genetic sources of forest tree seed and trees?
- Does the FMP maintain or enhance long-term forest soil productivity?

The monitoring program must assess not only ecological processes and management activities, but also the cultural and economic circumstances linked to them. Therefore, monitoring projects must be designed to provide information to evaluate the integration of natural and social systems.

The key questions must first be broken down into components that can be addressed by specific monitoring projects. Projects will be developed around precise, well-focused monitoring questions that focus on specific information needs. Monitoring projects will be initiated as determined by requirements of the management experiments. Identification and definition of monitoring needs will be part of the decision analysis process during the "assess" and "design" phases of adaptive management.