

**Oregon Roundtable on Sustainable Forests
Preliminary Evaluation of Indicator of Sustainable Forest
Management**



Indicator F.a.: *Tree mortality from insects, diseases, and other damaging agents*

Current desired trend/target: Stable or decreasing long-term levels of Oregon forest tree mortality.

The following is a response by Oregon Department of Forestry (ODF) technical and policy staff to the March 9, 2011 Oregon Roundtable on Sustainable Forests preliminary evaluation of Indicator of Sustainable Forest Management F.a.: *Tree mortality from insects, diseases, and other damaging agents*. This evaluation can be accessed at:

http://www.oregon.gov/ODF/indicators/docs/Draft_Fa_Evaluation.pdf

The current data report for this indicator can be accessed at:

<http://www.oregon.gov/ODF/indicators/indicatorFa.shtml>

This online report reflects the revisions indicated in this response.

Key Roundtable findings

1. The January 10 meeting presentation provided greater detail than the online report. Revise the report to include that information.

Staff Response: The online indicator report will be revised to include the latest revised information described here.

2. Clarify whether the indicator is measuring tree “mortality” or tree “mortality and damage.” Both terms are used.

Staff Response: The original, approved indicator title is “*Tree mortality from insects, diseases, and other damaging agents.*” The terminology and data in the indicator report has been changed to describe only “tree mortality.” References and data related to forest “damage,” which can occur due to the activity of insect defoliators, needle diseases, or other agents, but does not usually cause tree mortality, have been removed to improve clarity. When the indicator is considered for revision, staff recommends the title be changed to “*Tree mortality from insects, diseases, wildfire, and other agents.*”

3. What information is lost by not tracking fires between 100 and 1000 acres in size? Can that gap be filled?

Staff Response: Information presented at the meeting on the tracking of wildfire-related tree mortality was insufficiently described. Currently, statewide aerial surveys collect tree mortality estimates on wildfires

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greater than 100 acres. However, over the last three decades these areas represent less than one percent of the total tree mortality reported. The Northwest Interagency Coordinating Center's Pacific Northwest Wildfire Coordinating Group (PNWCG) assesses all reported fires, but includes no tree mortality estimates. The Wildland Fire Leadership Council's Monitoring Trends in Burn Severity (MTBS) project provides both burned area estimates and a burn severity rating on wildfires greater than 1000 acres. This threshold was established for all western States as it represented greater than 95 percent of the burned area. And, while it would appear that a significant data gap exists for tree mortality estimates on fires less than 1000 acres, data indicates that fires below this threshold value represent less than three percent of the total area burned (PNWCG 2000-2010).

Additional language has been added to the indicator report to describe this. Descriptions and figures have also been added to the indicator to provide estimates of annual statewide tree mortality from wildfires and the trend using MTBS project data. All burn severity classifications were included as each description contained some degree of overstory tree mortality. Previous descriptions and figures related to the "surrogate" wildfire damage estimates, from the ODF change detection study, have been removed from the indicator.

4. There is interest in reporting at regional sub-state scales (NW, SW, E). We already have a good spatial display but could break down tabular data by region.

Staff Response: As recommended, an additional figure and description has been added to show regional estimates of tree mortality in Northwest, Southwest, and Eastern Oregon as determined by annual statewide aerial surveys. Attempts will be made to describe wildfire-related mortality similarly, but this data is not yet available. The ODF fire protection district boundaries were used to delineate the regions.

5. Recommend quality rating be changed to "adequate."

Staff Response: The information quality rating has been changed from "partial" to "adequate" as recommended.

6. Need to provide criteria on what numbers would have to be to be considered in "good" or "poor" condition - hard to do with multiple variables.

Staff Response: As occurred in Roundtable discussions, consultation with additional staff and outside forestry experts provided no consistent agreement on what amount of tree mortality in Oregon would constitute a "good" versus "poor" condition. Therefore, we are recommending annual ratings based on comparisons of current year results to the average tree mortality over the longest-term, complete data available. While not ideal, this type of relative assessment provides a consistent measure and independence from diverse, subjective values. If all annual estimates of tree mortality from insects, diseases, wildfire, and other factors included in the indicator fall at or below long-term averages, the condition will be "good." If all annual estimates included exceed the long-term average, the condition will be "poor." If annual assessments are divergent, the condition will be "mixed." Currently, the Roundtable has rated the condition as "fair," but we recommend a change to "good" based on the above criteria. We do not recommend

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“rolling” averages or those over shorter intervals given the need to encompass the full scale of fluctuations that can occur.

7. Need to provide criteria on what numbers would have to be to be considered an “improving” or “deteriorating” trend but data appears to lead to a conclusion that there is an improving trend.

Staff Response: Staff recommends the desired trend statement for this indicator be revised to read: “Average to below-average annual tree mortality on Oregon forest lands, relative to previous statewide assessments.” (Please see the response to Question 6 above.) The criteria as to whether the trend is considered to be “improving” or “deteriorating” can be highly subjective, so annual ratings will be given based on comparisons to the average tree mortality over the longest and most complete time frames available for each data set. If all annual estimates of tree mortality from insects, diseases, wildfire, and other factors in the indicator are trending toward the target (at or below the long-term average), the condition will be “improving.” If all annual estimates are trending away from the target (exceeding the long-term average), the condition will be “deteriorating.” If annual assessment trends are divergent, the condition will be “mixed.” Currently, the Roundtable trend rating for this indicator is “mixed,” but we recommend a change to “improving” using the above criteria.

8. There is concern about the ability to continue the same level of data collection beyond 2011.

Staff Response: In the near future, it appears that aerial surveys and other remotely-sensed data used to assess statewide tree mortality will be maintained despite losses in state and federal funding. While the long-term trend in maintaining statewide coverage of these data remains uncertain, we support the Roundtable assessment that the current information rating should be changed to “adequate” and the indicator will be updated to reflect this.

Additional Roundtable comments organized by indicator evaluation questions

1. Is the purpose and intent for the indicator clear?

- Consider adding “fire” specifically in the indicator title.
- Without management some forest stands will either burn or be killed by insects. The indicator needs to reflect that.

Staff response: Staff agrees that “wildfire” should be included in the indicator title during the Board of Forestry’s indicator review and revision process. The online report includes new figures and descriptions of wildfire-related tree mortality on Oregon forest lands. In terms of “future risk” assessments related to tree mortality, wildfire is currently addressed in indicator “F.c. Forest fuel conditions and trends related to wildfire risks.” A revised “National Insect and Disease Risk Map” from the Forest Health Technology Enterprise Team is underway and could potentially be incorporated as a data source into this indicator upon completion in 2012.

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2. Is the protocol for indicator data collection clear and technically sound?

- Generally, the protocol is clear.
- There will be a natural level of mortality. Do we know what that is from all sources?
- Statement that “four percent mortality per year is normal” needs to be clarified by staff in its response. Seems illogical as it could be interpreted that there would be 100 percent mortality is 25 years.
- Report small fire data separately rather than mixed into the aerial insect and disease survey data.
- Provide narrative of major events to go with the bar chart time series to explain the big spikes.
- Recognize limitations of only going back 30 years. Different historical comparisons could lead to different conclusions.
- The evaluation states protocol is limited to 30 years of data but USFS has 60 years of data. This topic needs to be further clarified.
- Are we remapping the same mortality year to year?
- Landowners frequently harvest dead or dying trees – it appears this could be missed by the protocol.

Staff response: The concept of “background” or “normal” levels of tree mortality is not something that in our view can be consistently agreed upon due to its highly subjective nature. Therefore, we have revised the indicator to compare annual assessments to the most complete, longest-term average available for the data sources. Tree mortality estimated from statewide aerial surveys was averaged since 1980, while MTBS project data (for wildfire only) was averaged since 1984. While additional data exists prior to these dates, these ranges were selected due to their representing the start of consistently-performed, annual data collections that had statewide coverage. Additional figures of wildfire data have been incorporated, as well as descriptions of specific, large-scale disturbance events (insect outbreaks, etc.), that occurred during the given time period. During aerial surveys, some tree mortality may indeed be “remapped” due to trees retaining mortality signatures (foliage changes) for greater than one year. However, aerial survey estimates are conservative and thus consistently under-represent total mortality due to their inherent limitations. Previous ground surveys have indicated that “re-mapping” does not appear to significantly affect overall estimates. Lastly, we agree that some of the harvesting of dead and dying trees may not be captured annually due again to survey limitations, but we do not anticipate this will significantly affect overall results or trends.

3. Are indicator data being reported at the appropriate spatial and temporal scales?

- Be clearer about where mortality is occurring. The meeting presentation provided greater detail than the online report. Revise the report to include that information.
- Different conclusions could be drawn at sub-regional scales.
- In ecological terms, forest disturbance cycles can span multiple human generations. But there are obvious economic and social downsides when a forest experiences significant natural mortality followed by slow recovery that could take decades.

Staff response: An additional figure and description has been added to the indicator to show regional estimates of “tree mortality” in Northwest, Southwest, and Eastern Oregon as determined by annual statewide aerial surveys. Attempts will be made to describe wildfire-related mortality similarly, but this data

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is not yet available. The ODF fire protection district boundaries were used to delineate the regions. Staff will review trends at sub-regional scales and make recommendations for incorporation into future indicator revisions. While it is true that the time frames of the data sources for this indicator are relatively short, we have attempted to use the most complete and long-term data source available. Comparisons of the data over the time frame shown to estimates from previous reports also indicate that the period from 1980-2009 (for Statewide aerial surveys) and 1984-2008 (for the MTBS project) provides a reasonable representation of the overall range of tree mortality that has been reported historically in Oregon. While additional data outside of this range could be incorporated, the time frames used for these data sources represent consistently-performed, annual data collections with statewide coverage, which is not the case for other historic reports.

4. Has the Department appropriately assessed the quality of the indicator information?

Original indicator report conclusion *Information = Partial* Conclusion following Roundtable evaluation and staff recommendation *Information = Adequate*



- Information quality is better than for most of the other indicators.

Staff response: We support the Roundtable assessment that the information rating should be changed to “adequate.”

5. Has the Department appropriately assessed the conditions measured by the indicator?

Original indicator report conclusion *Condition = Mixed* Conclusion following Roundtable evaluation *Condition = Mixed* Staff recommendation *Condition = Good*



- What are the mortality goals and how are those goals justified? What would be a normal ecological occurrence?
- Some believe there is no evidence that insect and disease damage is outside the ecological norm, so it should be considered "Good". Exceptions may be Swiss needle cast and fire danger from fuel build-ups due fire suppression.
- Insect populations may be within ecological range but still can cause economic and social problems.

Staff Response: The concept of “background” or “normal” levels of tree mortality is not something that in our view can be consistently agreed upon due to its highly subjective nature, and we have found no consistent agreement on what amount of tree mortality in Oregon would constitute a “good” versus “poor” condition. Therefore, we are recommending annual condition ratings based on comparisons of current year

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results to the average tree mortality over the longest-term, complete data available. While not ideal, this type of relative assessment provides a consistent measure and independence from diverse, subjective values. If all annual estimates of tree mortality from insects, diseases, wildfire, and other factors included in the indicator fall at or below long-term averages, the condition will be “good.” If all annual estimates included exceed the long-term average, the condition will be “poor.” If annual assessments are divergent, the condition will be “mixed.” Currently, the Roundtable rating of condition is “mixed,” but we recommend a change to “good” based on the above criteria. We do not recommend “rolling” averages or those over shorter intervals given the need to encompass the full scale of fluctuations that can occur. Lastly, we admit that while it is a valid point, we are unsure how to adequately address the highly varied and complex economic and social implications of tree mortality, as it occurs across the landscape, within this indicator.

6. Has the Department appropriately assessed the current trend measured by the indicator, when compared to the Desired Trend Statement?

Original indicator report conclusion <i>Trend = Mixed</i>	Conclusion following Roundtable evaluation <i>Trend = Mixed</i>	Staff recommendation <i>Trend = Improving</i>
		

- Report future outlook separately.
- Some believe the trend appears to be that bugs are currently in balance. Close watch should be kept to see if climate change is resulting in more bug damage/mortality.
- Some see western Oregon in balance but eastern Oregon on the verge of increasing tree mortality.
- Have natural processes been perturbed by human actions?

Staff response: In terms of “future risk” assessments related to tree mortality, wildfire is currently addressed in indicator “F.c. Forest fuel conditions and trends related to wildfire risks.” A revised “National Insect and Disease Risk Map” from the Forest Health Technology Enterprise Team is underway and may be incorporated when it is available in 2012. It consists of a number of individual models that consider the spread of current outbreaks, changing climatic conditions, and the introduction of new non-native species (among many other factors) in generating a nationwide “risk” map for forests. The concept of “balance” and “normal” levels relative to tree mortality is something that in our view cannot be consistently agreed upon due to its highly subjective nature. While human factors have certainly helped to shape the current condition of Oregon forest lands, we admit we are unsure how we would adequately address this within the context of this indicator. Currently, the Roundtable trend rating for this indicator is “mixed,” but we recommend a change to “improving” using criteria described under Key Finding #7 (above).

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7. Can a case be made that other technical information should be considered as a supplement or an alternative to the information already provided for the indicator?

- Look at the same GNN vegetation data used for Indicator E.a. Perhaps more useful than FIA-only data.

Staff response: Due to the limitations of FIA survey data in describing tree mortality (primarily assesses “damage”) and because it is not readily available at the scale and over the time frame for needed comparisons, we have removed it from this indicator. We will evaluate GNN vegetation data and other ground survey information as recommended for consideration in future indicator revisions.

8. Do you believe there is an adequate level of institutional commitment and resources allocated for continued full implementation and reporting of this indicator into the future?

- No Roundtable comments.

9. What improvements would you like to see in future reporting for the indicator?

- Need more information about what each of the fire severity classes used really means -- perhaps pictures of severity examples.
- Look at a rolling 10-year average to smooth out data trends
- Provide more discussion on the relationship between weak/dead trees and fire occurrence. This relationship is often assumed but not born out by available research.
- Reporting should be based on whether or not the ecological system is behaving as expected, as this is an ecological indicator.

Staff response: The fire severity classes from the MTBS project are briefly described in the indicator and a more complete description can be provided as needed. Images that illustrate these, however, are not to our knowledge available. We do not recommend “rolling” averages or those over shorter intervals given the need to encompass the full scale of the fluctuations that occur. It is beyond the scope of this indicator to describe the complex relationship that occurs between disturbance events and fire occurrences; however, this is addressed to some degree in indicator “F.c. Forest fuel conditions and trends related to wildfire risks.” Attempts have been made to provide some degree of context for the tree mortality described here, so that annual values can be viewed relative to historic ones. Or, to say it another way, are agents behaving “normally,” as far as we can tell. In our view, even though the time frames provided here are relatively short, they do appear to provide a reasonable representation of the overall range of tree mortality that has been reported historically in Oregon.

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