



What is a healthy forest?

Game Commission's deer program uses regeneration to measure forest health

Forest regeneration is a good measure of forest habitat health. When a forest can produce enough young trees to replace the canopy trees when they are cut, blown down, or die, it provides a sustainable and healthy forest. Deer and other wildlife need healthy forest habitat for food, cover, and survival.

To assess forest habitat health, the Game Commission uses data collected from the Pennsylvania Regeneration Study (PRS). The PRS is a collaborative effort between the Department of Conservation and Natural Resources, U.S. Forest Service, and Penn State University. PRS plots are located in every Wildlife Management Unit on both private and public forest lands. It takes five years for all plots to be visited across the state.

Regeneration is measured by the number of tree seedlings and saplings. At each plot, seedlings and saplings are counted and categorized by species. Additional information collected includes an estimate of deer impact, percent cover of competing vegetation, and other site limitations.

At the Game Commission's request, data are compiled according to the number of plots with enough seedling and saplings to replace the overstory trees. Whether a plot has enough young trees depends on observed deer impact in the area. For example, a greater number of saplings are required to replace the existing canopy where deer impact is "very high" compared to fewer saplings required where deer impact is "very low".

| Deer impact | Habitat condition |
|-------------|--|
| Very low | Seedlings and saplings common and free to grow with minimal browsing, diverse herbaceous community present. |
| Low | Seedlings and saplings common, widespread, light browsing, diverse herbaceous community present. |
| Medium | Seedlings and saplings present but browsed to uniformly low heights, only unpalatable herbaceous plants present. |
| High | Seedlings and saplings lacking, with "hedging" apparent from heavy browse pressure, few herbaceous plants. |
| Very high | Seedlings and saplings absent, heavy browse line apparent, only hardiest, unpalatable species present. |

Areas with ample food to support the local deer population will be evident by very low to medium deer impact. Areas lacking food to support the local deer population will be evident by high to very high deer impact.

Deer are not the only factor affecting forest health

A healthy forest can maintain and replace itself, but deer are not the only factor influencing forest health. Other important concerns are amount of light reaching the forest floor, soil conditions, diseases, pests, and competitive vegetation. The ability to reduce the influence of non-deer factors such as light and soil conditions on regeneration is a strength of PRS data.

For example, the amount of light reaching the forest floor can substantially affect the number of seedlings in a forest. Fewer young trees are found under a closed canopy than under a more open canopy. Because of the relationship between sunlight and regeneration, the PRS only measures regeneration plots where enough light reaches the forest floor to stimulate regeneration.

Changing soil conditions can affect regeneration. Some tree species, such as sugar maple, are more sensitive to certain soil acidity, while others, such as white pine and black birch, are more tolerant. Within the PRS, regeneration is assessed by tree species groups, not by regeneration of a single species. This tree grouping also includes both acid sensitive and acid tolerant trees with each species given equal weight in assessing

regeneration. In other words, a black birch seedling is equal to a sugar maple seedling in the assessment, thus reducing the influence of acid deposition on regeneration assessment.

Examples of tree species measured for the deer management’s assessment of forest health

| | |
|---------------------|--|
| Eastern Hemlock | Black Gum |
| Red Maple | Aspen |
| Sweet (Black) Birch | Other Birches |
| Beech | Other Maples (except Norway and Striped) |
| Ash | Other Conifers |
| Yellow Poplar | Black Locust |
| Oaks | Sweet Gum |
| White Pine | Honey Locust |
| Sugar Maple | Black Walnut |
| Hickories | Sycamore |
| Black Cherry | Elm |

Ranking Forest Health

Assignment of “Good”, “Fair”, and “Poor” follow specific criteria. A WMU’s forest habitat health will be considered “Good” if the observed percentage of plots with adequate regeneration is greater than or equal to 70 percent. A WMU’s forest habitat health will be considered “Poor” if the observed percentage of plots with adequate regeneration is less than 50 percent. “Fair” forest health falls between “Good” and “Poor”.

| Forest health | Percent of plots with adequate regeneration | Description |
|---------------|---|---|
| Good | ≥70% | Forest canopy replacement will occur without further actions to mitigate deer impacts. |
| Fair | 50 - 70% | Forest canopy replacement can occur but DMAP, and some deer deterrent fencing are required. |
| Poor | <50% | Forest canopy replacement will not occur without deer deterrent fencing and DMAP. |

Conclusion

The primary performance measures for forest habitat health provides a scientific foundation upon which deer management recommendations can be established and progress monitored. As with all scientific endeavors, measures are assessed and adjusted as circumstances change and new information becomes available. We expect to regularly evaluate and refine these measures to ensure management recommendations are based on the best available information.

In addition, a healthy deer herd will not necessarily correspond to good forest health. Alternative food sources, such as agriculture crops, can elevate deer nutrition but not increase forest regeneration. For this reason, deer and forest health measures are evaluated separately.

