

Map Unit Forest Productivity Index

The Minnesota Forest Productivity Index (FPI) ratings provide a relative ranking of soils based on their potential for growth of quaking aspen (*Populus tremuloides* Michx.). The index can be used to rate the potential yield of one soil compared to that of another over a period of time. Ratings range from 0 to 100. The higher numbers indicate higher potential for aspen growth.

The FPI ratings do not take into account climatic factors, such as the differences in precipitation or growing degree days across Minnesota. The ratings are based on physical and chemical properties of the soils and were aggregated into three categories: by their effects on water availability (including soil drainage class, depth to water table, and available water storage), on nutrient availability (including organic matter and exchangeable bases), and by other (site) factors (including bulk density of the rooting zone and stone content).

All soil component mapping phases in Minnesota were evaluated, and a FPI was generated for each phase. A statistical mean FPI value was created for each soil component mapping phase. All map units were populated with each component's mean FPI value, and a weighted average FPI was created for each soil map unit in the state. An individual map unit (for example, Warba fine sandy loam, 1 to 8 percent slopes) will have the same FPI value wherever that map unit occurs throughout the state.

When the soils are rated, traditional aspen management, including clearcut harvest with natural regeneration, is assumed. Tree growth is not only influenced by soil properties but by such variables as climate, stand history, and management. In addition, soil properties are highly variable in forested landscapes, and the index only considers properties of the average soil. Despite these qualifications, the indices for specific soils are expected to remain relatively constant in relation to one another over time.