Soil Quality Enhancement Activity – SQL13 - Forest stand improvement for soil health

Enhancement Description
This enhancement consists of forest management activities (planting, tending, and harvesting) to minimize impacts on forest soils and improve soil health.

Land Use Applicability
Forestland

Benefits
Managing forest activities to improve soil health will increase soil organic matter, improving nutrient cycling and increasing absorption of rainfall. Avoiding soil compaction allows for greater root development and tree growth, which limits windthrow, minimizes drought stress, and reduces susceptibility to insects and disease. Limiting soil disturbance and controlling erosion increases organic matter, improves infiltration and limits offsite sedimentation. Further benefits include increased carbon storage on site, a healthier soil microbial community, and wildlife benefits from woody material on the forest floor.

Conditions Where Enhancement Applies
This enhancement applies to all forest land acres.

Criteria
Develop and implement a Forest Management Plan which addresses either timber harvest plan option below and the respective activities as specified by category.

- If a timber harvest occurs during the contract period, this enhancement requires that two activities from each of the following categories be completed. Where a duplicate activity appears in two categories, it can only be considered adopted in one category.

- If no timber harvest occurs during the contract period, this enhancement requires that three activities from each of categories 4 and 5 be completed.

1. Avoid soil compaction during and following timber harvests
   a. Limit the area of compacted soils by using equipment on established roads and trails and minimizing travel into the general forest area.
   b. Operate equipment on woody debris (slash) in areas with sensitive or wet soils.
   c. Sequence harvest activities (back to front) to limit the number of equipment passes.
   d. Use smaller and lighter equipment, track equipment, low PSI tires, and lighter loads.
   e. Use mules, draft horses or other animals for moving harvested trees.
   f. Restore heavily compacted areas after harvest (e.g., by sub-soiling or other mechanical

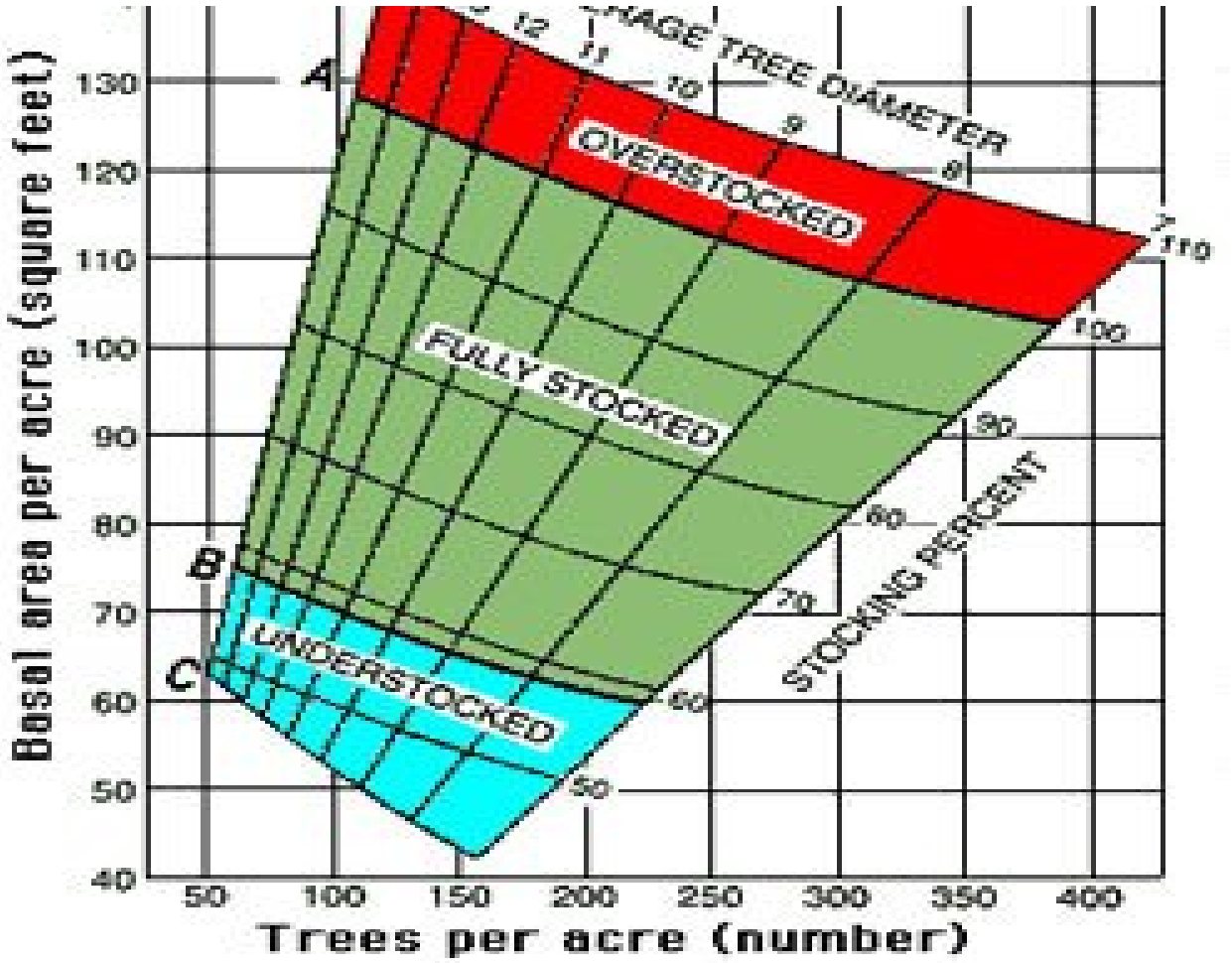
method).

2. Limit impacts of roads and landings during and following timber harvests
   a. Avoid disturbing natural drainage channels (e.g., use culverts to allow streams to pass under roads; design road locations to minimize stream crossings and diversions).
   b. Roads and landings occupy 5% or less of total wooded acreage.
   c. Establish cover on roads and landings as soon as possible after harvest.
3. Limit soil disturbance and control erosion
   a. Avoid disturbing forest litter and the soil surface.
   b. Protect roads through the use of water bars/rolling dips.
   c. Establish cover on disturbed areas after forest management activities are complete.
   d. Retain downed tops and other unharvested materials for ground cover, nutrient recycling, and organic matter retention.
   e. Control the amount of road use between harvests to prevent erosion.
4. Maintain favorable conditions for forest growth
   a. Control the amount of road use, and off-road travel, to prevent erosion, compaction, and disturbance of the soil surface.
   b. Establish cover on any disturbed areas.
   c. Protect roads and water quality by establishing and maintaining water bars/rolling dips, culverts, or other water management structures.
   d. Monitor the forest area for signs of insect damage, tree diseases, invasive plants, or other impacts on forest growth and health.
5. Retain and enhance carbon storage and support soil ecologic functions
   a. Follow stocking guidelines to maintain tree canopy cover (i.e., between the A and B lines of stocking guides at a minimum; preferably closer to the A line). See the stocking chart shown below.
   b. Add woody material to the soil by girdling or cutting non-merchantable trees.
   c. Use extended rotations to keep carbon on the site for a longer period.
   d. Retain fallen trees, branches, snags, downed tops and other unharvested materials for ground cover, nutrient recycling, and organic matter retention, as specified in the state supplement.
      i. For western conifer forests, maintain coarse woody residue which is:
      - greater than 3” in diameter,
      - left lying on the soil surface, and
      - which meets the post-harvest target levels of the following chart:

	Habitat Type	Target tons per acre of coarse woody debris
Dry Forests	Ponderosa pine types	5-13 tons/acre
⇕	Douglas-fir types	7-14 tons/acre
	Grand fir types	7-14 tons/acre
Moist Forests	Western hemlock types	16-33 tons/acre

   e. Maintain soil productivity by soil testing and fertilization if needed (including options for fertilizing with manure or other organic materials).
   f. Utilize a majority of the volume of harvested wood in long-lasting products.

Stocking chart showing tree size and density scales indicating when forests are overstocked (too crowded), fully stocked (providing good growth), and understocked (trees do not fully utilize the site). Stocking guides were developed by Gingrich (1967). See citation in References section for more information.



Adoption Requirements

The enhancement is considered adopted when either criteria scenario is deemed implemented on the forest land use acreage.

Documentation Requirements

Following implementation of this activity, the landowner must document:

1. List of all criteria activities implemented
2. Map with location of roads, landings, and implemented activities
3. Photos of areas where activities were implemented

References

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