

**ITEM 4-3
Soil Productivity**

ACTIVITY, PRACTICE OR EFFECT TO BE MEASURED	REPORTING PERIOD	VARIABILITY (+/-) WHICH WOULD INITIATE FURTHER EVALUATION
Monitor the effect of soil disturbance/displacement on land productivity.	Annual	Movement or compaction of soils reducing productivity more than 20 percent.

Introduction: The objective of this monitoring item is to determine whether changes in soil bulk density and organic matter or amount of soil movement, reduces basic soil productivity more than 20 percent.

Methods: Several procedures are used to monitor soil productivity. Range allotments are monitored annually to assess the amount of soil compaction in sensitive areas caused by grazing. Compaction on roads and skid trails is assessed during annual Forest Plan monitoring field reviews of timber sales. The potential for organic matter and nutrient recycling is assessed on these sites from the amount of woody debris left on site after timber harvest activities. The amount of soil movement is inferred by evaluating the potential for tractor harvest to cause soil displacement on units where slopes are greater than 35 percent. These units are individually reviewed and approved to assure meeting soil productivity standards.

Results: During 2000 and 2001, the Lolo National Forest had 13 active timber sales with contract requirements for coarse woody debris retention. Of the 13 timber sales, 111 units had coarse woody debris left on-site. Out of the 111 units with coarse woody debris 71 units were assessed for adequacy of coarse woody debris. All of the units assessed were found, by general observation, to have had sufficient amounts of coarse woody debris remaining on-site after harvest. In addition, 43 units met the Forest's scarification guidelines.

Timber Sale	District	No. of Units	No. Units Requiring Woody Debris	No. of Units assessed for Woody Debris	No. Units w/ sufficient Woody Debris
Northside	Missoula	24	24	8	8
Lolo Cloudburst	Missoula	83	40	16	16
Marshall Ski 2	Missoula	5	0	0	0
Arch Loop	Seeley Lake	7	7	7	7
Chain of Lakes	Seeley Lake	13	0	0	0
Arch Inez	Seeley Lake	4	3	3	3
Dry Camp	Plains	3	3	3	3
Raven	Plains	5	5	5	5
Boyer	Plains	10	10	10	10
Hardknox	Plains	12	12	12	12
Fitness	Plains	2	2	2	2
Mosquito	Plains	1	1	1	1
Wee TeePee	Plains	2	2	2	2
Chipmunk	Plains	2	2	2	2

Evaluation: Organic matter, in the form of coarse woody debris retained in harvest units, was found to be sufficient in 100 percent of the harvest units requiring such retention during 2000/2001.

The coarse woody debris retention requirement arose when many silviculture prescriptions combined clear cutting and tractor piling site preparation. Prescriptions have evolved away from clear cutting and tractor piling to partial cutting followed by under burning. Currently, many treated stands are of small diameter and the coarse woody material retained is of smaller diameter (4.5 to 5.5 inches) than was envisioned when this monitoring item was developed. Small diameter material is often fully or partially consumed in slash treatment following harvest.

Previous Forest Plan Monitoring Reports recommended that silviculturists, wildlife biologists, and soil scientists review the intents and approaches used to insure sufficient coarse woody debris retention following timber harvest and suggest modifications or improvements. To address this recommendation, an updated version of “The Woody Debris Resource on the Lolo National Forest” was released as a review draft in June, 2002.

Recommendation: Certain management practices have problems meeting soil productivity standards. Soil compaction from livestock grazing in riparian areas continues to be one of these practices although notable improvements have been made in the last several years. Range allotments will continue to be monitored and management practices improved so that all range allotments meet Forest Plan Standards.