Ⅲ Impact of Radioactive Substance on Forest Management

The Forestry Agency and Fukushima Prefecture have set up test sites in the prefecture to work on various projects. These efforts include investigating the impact of activities such as thinning on air dose rates, validating techniques intended to suppress the movement of radioactive cesium, and reduction of exposure doses to workers working within forests.

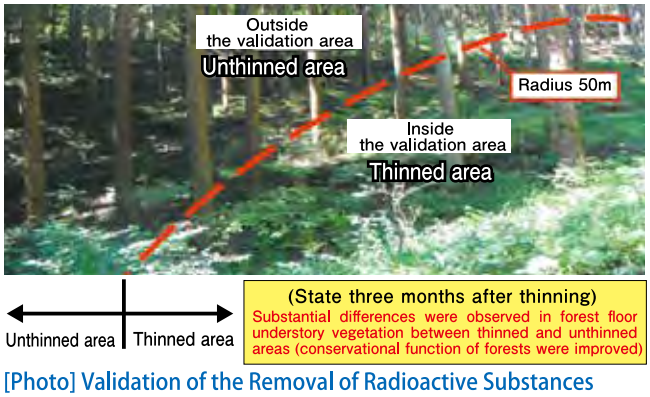
Effects of Thinning, and Its Impact on Air Dose Rates

In Fukushima Prefecture, a test site in a Japanese red pine forest was set up in Kawauchi Village from 2012 to 2017,and used to survey the impact of thinning on air dose rates. In April 2012, air dose rates were measured before and after thinning and harvesting operation. The air dose rate, which was 4.52 μSv/h before operation, decreased by 12% to 3.87 μSv/h after the operation. By three months after the thinning, undergrowth vegetation had flourished on the forest floor, so the vegetation was obviously different from that before thinning (photo).

Thinning brightens the inside of the forest and promotes the growth of understory vegetation, reducing the direct impact of rain drops on the ground surface, which is expected to suppress the movement of radioactive cesium by suppressing movement of topsoil.

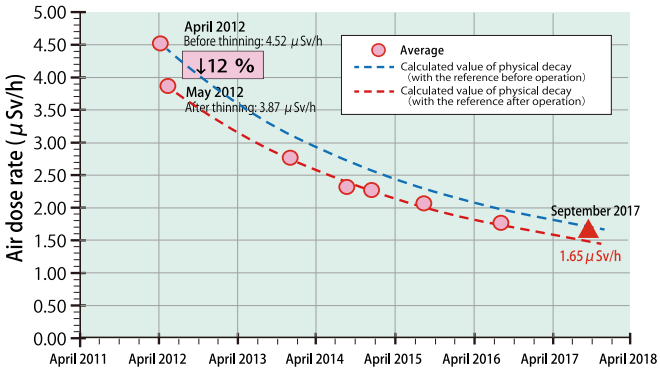
In September 2017, five years and five months later after the thinning, it was confirmed that the air dose rate was continuing to decrease at almost the same rate as the value estimated from physical decay of radioactive cesium (Figure 1). At this moment of seven years and seven months after the reactor accident, most of the radioactive cesium in forests has accumulated in the soil surface layer, and the proportion included in trees is small. Therefore, it seems that the air dose rate does not change greatly between before and after thinning at the current stage.

Furthermore, forest management work such as harvesting and thinning improves the light environment in the forest, and raises the soil surface temperature. This would appear to have an effect in promoting movement of radioactive substances to the soil, by assisting decomposition in the litter layer. The illustration below (Figure 2) shows the movement of radioactive substances within forests.



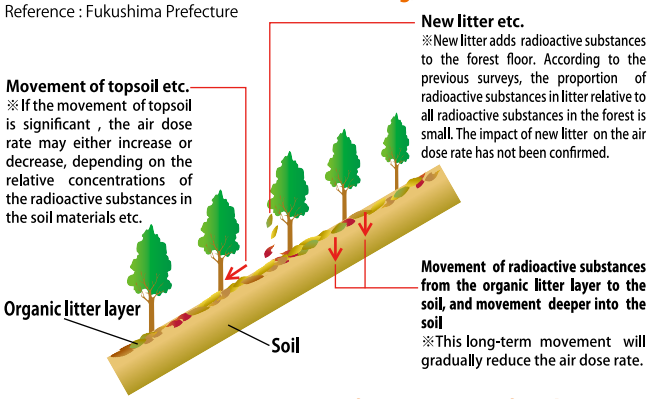
[Photo] Validation of the Removal of Radioactive Substances from Forests (Effects of Thinning)

(Note) The validation area was set as a circle of 50m radius of approximately 0.8ha.
Reference : Fukushima Prefecture "Long-term Monitoring of Radioactive Material in the Forest and Associated Countermeasures" (FY2014 and FY2015)



[Figure 1] Validation of Countermeasures against Radioactive Substances in Forests (effects of thinning, etc.)

Reference : Fukushima Prefecture



[Figure 2] Conceptual Diagram of Movement of Radioactive Substances Observed in the Forests

Reference : Forestry Agency (FY2017) "Results of the Validation and Development Project for Countermeasures against Radioactive Substances in Forests"