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Infested Forests and Evapotranspiration

The purpose of this experiment was to identify if selective clear cutting brought on by spruce budworm infestation, is beneficial in increasing stream flow. In this project, it was hypothesized that the loss of mixed conifer forests could influence the amount of ET (evapotranspiration), overall increasing the amount of water in the unsaturated zone. The project was believed to somehow quantitatively show a measure of this increase through a water balance equation. The following steps were taken: installing Watermark soil moisture sensors on both a treated or deforested and untreated or tree filled basin on the Trinchera Ranch. Readings were taken from these sensors in September, October, January and February. By taking readings, a soil moisture characteristic curve was found which allowed change in storage to be calculated. The following equation with runoff and precipitation was used to find ET: ET=P-R-changes. ET in the treated area was 0.03 inches and in the untreated was 0.13 inches. ET was put into the water balance equation with precipitation, runoff, and an area of 1,000 ft2 to find the overall discharge: Q=(P-R-ET)A. IN the treated basin, there was about 277 gallons of discharge, in the untreated, about 202 gallons of discharge. With the calculated discharge more in the area of no trees, it was concluded that this did support the hypothesis. The project will be continued by placing additional sensors up the drainages, taking into account additional parameters, refining the process and creating an equation to model it.