

Polk County Tornado Timber Damage Assessment
Texas A&M Forest Service
25 April 2020

A tornado touched down on 22 April 2020 at 5:35 pm CDT at EF0 intensity on the west shore of Lake Livingston in San Jacinto County, Texas. It crossed the lake reaching a maximum intensity of EF3, struck the town of Onalaska with estimated winds of 140 mph, then continued approximately 30 miles on an east north east path across most of Polk County mostly as an EF1 tornado. The majority of timber damage was sustained between Onalaska and Seven Oaks. Texas A&M Forest Service began to implement a rapid timber damage assessment on 23 April.

A TFS forester conducted an aerial survey of the impacted area on Thursday, 23 April. The survey was used to map the timber damage boundary which extended from Onalaska to approximately 8 miles east of Seven Oaks, and reached a maximum width of 300 yards (Fig 1).

Forest Inventory and Analysis (FIA) data collected in 2018 was used to estimate the volume of timber present in the region before the tornado. Sentinel-2 imagery collected before (16 April 2020) and immediately after the event (23 April 2020) was used to estimate the amount of timber damaged by the tornado. Damaged trees were uprooted, snapped off below the crown, or leaning significantly. Throughout the path of the tornado, severity of timber damage ranged from light to heavy based on the percent of trees damaged:

- Light: 0-20 percent
- Moderate: 20-60 percent, and
- Heavy: 60-100 percent.

The estimated volume of timber damaged determined from image analysis was applied to the FIA data to produce Tables 1 and 2.

The total mapped area containing damaged timber was 5,651 acres of which 1,600 acres were damaged pine forest and 1,229 acres were damaged hardwood forest. Total volume of timber damaged is estimated to be 2.2 million cubic feet (Table 1) worth a total stumpage value of \$1.9 million (Table 2) and total delivered value of \$3.5 million. For perspective, Southeast Texas contains more than 8.7 billion cubic feet of growing stock timber in 22 counties.

Total poletimber damaged by the Polk County Tornado was 422,068 cubic feet worth approximately \$63,000. The total volume of sawtimber damaged was 10.7 million board feet. For perspective, this is enough lumber to frame over 650 homes two-thousand square feet in size. Sawtimber damaged by the tornado is worth approximately \$1.8 million.

Sawtimber-size trees are at least 9.0 inches in diameter at breast height (4.5 feet above the ground) for pine and at least 11.0 inches in diameter for hardwood. Poletimber-size trees are at least 5.0 inches in diameter, but smaller than sawtimber size.

Questions about the Timber Damage Assessment should be directed to Dr. Aaron Stottlemyer, Texas A&M Forest Service Forest Analytics Department, astottlemyer@tfs.tamu.edu.

This report can also be downloaded from the TFS web site at <http://tfsweb.tamu.edu/>. Texas A&M Forest Service is a Member of The Texas A&M University System.

Figure 1. Polk County Tornado Forest Damage Severity



Table 1. Estimated Polk County Tornado Timber Damage Volume

Species group	Total (Cubic Feet)	Sawtimber (Cubic Feet)	Poletimber (Cords)
Pine	1,269,987	1,041,711	2,818
Hardwood	915,364	721,571	2,423
All	2,185,351	1,763,282	5,241

Table 2. Estimated Polk County Tornado Timber Damage Value

Species group	Total (\$)	Sawtimber (\$)	Poletimber (\$)
Pine	790,591	727,533	63,058
Hardwood	1,109,995	1,045,071	64,924
All	1,900,586	1,772,604	127,982