

Hurricane Michael
Florida Forest Service
Initial Value Estimate
of
Altered, Damaged or Destroyed Timber in Florida
10/19/2018

This preliminary value estimate of timber loss within the affected area of the Florida panhandle is based on the following assumptions:

Total estimated forest land area with catastrophic timber damage -	346,911 acres
Total estimated forest land area with severe timber damage -	1,042,939 acres
Total estimated forest land area with moderate timber damage -	1,418,795 acres
Total estimated forest land area damaged	2,808,645 acres
Timber damage percent in catastrophic damaged area -	95%
Timber damage percent in severe damaged area -	75%
Timber damage percent in moderate damaged area -	15%
Pine acres with catastrophic severe damage -	198,780 acres
Mixed upland acres with catastrophic damage -	86,034 acres
Bottomland acres with catastrophic damage -	62,097 acres
Pine acres with severe damage -	597,604 acres
Mixed upland acres with severe damage -	258,649 acres
Bottomland acres with severe damage -	186,686 acres
Pine acres with moderate damage -	812,969 acres
Mixed upland acres with moderate damage -	351,861 acres
Bottomland acres with moderate damage -	253,964 acres

Methodology

Following landfall of Hurricane Michael on October 10, 2018 maps were prepared using available wind speed data to calculate potential affected acres. These maps were further refined using available aerial imagery, aerial surveys and ground reconnaissance to determine areas that were catastrophically damaged, severely damaged and moderately damaged (Table 1). No estimation was conducted on minimally effected acres due to the lack of necessity for salvage harvesting.

Forest Inventory and Analysis (FIA) data for the affected counties was obtained. This data was used to obtain percent of forest land in each county, percent of forest type, and volume by forest type.

The affected acres in each county by damage type was then multiplied by the percent forest land in each county to determine the acres of affected forest land. The number of affected acres was then multiplied by the percent of forest type to obtain the number of affected acres in each forest type. The FIA volume data was used to calculate the average number of tons per acres for the forest types. The average tons per acres were multiplied by the number of acres to calculate the estimated number of tons.

Stumpage prices for timber products in the 3rd quarter of 2018 published by TimberMart-South were used to calculate the value of losses in each forest type. Specifically, Florida Region 2 average prices per ton were used in the calculations. The products used for pine acres included were pine pulpwood, pine chip-n-saw and pine

sawtimber. For mixed upland forests products included were pine pulpwood, pine chip-n-saw, pine sawtimber, hardwood pulpwood and mixed hardwood sawtimber. For bottomlands forests products included were hardwood pulpwood and mixed hardwood sawtimber.

The percent timber damage for each damage zone were based on visual observation and aerial imagery of the affected area. This percentage was multiplied by the number of tons per acre prior to the hurricane for each forest type to obtain the estimated number of affected tons. The estimated number of tons was then multiplied by the price per ton for each forest type to obtain an estimated value of the timber damaged (Table 2).

Estimated value of pine timber with catastrophic damage -	\$191,957,089
Estimated value of mixed upland timber with catastrophic damage -	\$ 49,930,972
Estimated value of bottomland timber with catastrophic damage -	\$ 78,828,506
Estimated value of pine timber with severe damage -	\$455,598,258
Estimated value of mixed upland timber with severe damage -	\$118,508,085
Estimated value of bottomland timber with severe damage -	\$187,094,377
Estimated value of pine timber with moderate damage -	\$123,957,506
Estimated value of mixed upland timber with moderate damage -	\$ 32,243,245
Estimated value of bottomland timber with moderate damage -	\$ 50,904,005
Total Estimated Timber Damage -	\$1,289,022,044

Disclaimer:

This preliminary value estimate of timber loss within the Hurricane Michael affected area is an estimate and should be accepted as such. Only through an actual statistical based intense aerial and ground survey can a more accurate timber volume and corresponding timber value figure be determined.

Potential Additional Costs or Loss of Value:

The above figures account only for immediate and direct impacts of Hurricane Michael on timber resources in Florida. Previous experience and technical forestry knowledge indicates that there will also be additional indirect and long-term impacts and value losses associated with Hurricane Michael.

Listed below are just of few of the additional future potential costs and impacts to the forest landowners and forest industry in Florida.

- **Significant debris removal costs for timber that cannot be salvaged.**
- **Reforestation costs that could be as high as 240 million dollars on pine stands alone in the catastrophic and severe damaged areas.**
- **Loss of additional timber because of pine beetle outbreaks or wind damage and reduced value of remaining timber because of poor form and wind sweep.**
- **Significantly increased threat and cost to suppress wildfires in areas with upwards to 100 tons per acre of forest fuels on the ground.**
- **Potential loss or the reduction of jobs and forest industry in the heavily impacted area because of a loss of forest products for an estimated 15 to 20 years into the future.**

Table 1. Counties and number of acres affected Hurricane Michael by damage class.
10/19/2018

COUNTY NAME	DAMAGE	ACRES	% Forest Land Area	Forested Acres Affected
BAY	CATASTROPHIC	95,740	74.60%	71,422
CALHOUN	CATASTROPHIC	171,376	88.10%	150,983
GULF	CATASTROPHIC	146,998	84.70%	124,507
				346,911
BAY	Severe	159,002	74.60%	118,616
CALHOUN	Severe	196,172	88.10%	172,828
GADSDEN	Severe	81,026	73.20%	59,311
GULF	Severe	166,668	84.70%	141,168
JACKSON	Severe	449,283	65.80%	295,628
LIBERTY	Severe	264,925	96.40%	255,388
				1,042,939
BAY	Moderate	121,809	74.60%	90,870
FRANKLIN	Moderate	334,181	84.80%	283,386
GADSDEN	Moderate	252,579	73.20%	184,888
HOLMES	Moderate	42,876	68.20%	29,241
JACKSON	Moderate	149,697	65.80%	98,501
LEON	Moderate	200,578	76.90%	154,245
LIBERTY	Moderate	271,043	96.40%	261,285
WAKULLA	Moderate	242,410	83.80%	203,140
WASHINGTON	Moderate	145,179	78.00%	113,240
				1,418,795

Table 2. Timber damage by forest type and damage classification.
10/19/2018

Forest Type	Damage	Damage Percent	Tons	Price per Ton	Estimated Value
Pine	Catastrophic	95%	9,442,060	\$ 20.33	\$ 191,957,089
Pine	Severe	75%	22,410,146	\$ 20.33	\$ 455,598,258
Pine	Moderate	15%	6,097,270	\$ 20.33	\$ 123,957,506
Mixed Upland	Catastrophic	95%	2,806,688	\$ 17.79	\$ 49,930,972
Mixed Upland	Severe	75%	6,661,500	\$ 17.79	\$ 118,508,085
Mixed Upland	Moderate	15%	1,812,437	\$ 17.79	\$ 32,243,245
Bottomland	Catastrophic	95%	5,646,741	\$ 13.96	\$ 78,828,506
Bottomland	Severe	75%	13,402,176	\$ 13.96	\$ 187,094,377
Bottomland	Moderate	15%	3,646,419	\$ 13.96	\$ 50,904,005
TOTAL ESTIMATED TIMBER VALUE DAMAGED					\$ 1,289,022,044



Hurricane Michael State of Florida

Map created 10/17/2018

Sources: National Weather Service;
National Oceanic and Atmospheric Administration.



Hurricane Michael Timber Damage

- Catastrophic
- Severe
- Moderate
- Hurricane Michael
- Hurricane Michael Track
- Interstates
- US Highways (USROUTE)
- State Roads (STROADNO)
- State of Florida
- City Limits

This map is the product of the Florida Forest Service.
No warranties are provided for data therein, its use,
or its interpretation.

0 5 10 20 30 40
Miles

Hurricane Michael
Timber Damage Photos
Florida Forest Service

Catastrophic Timber Damage



Bay County



Gulf County



Bay County



Bay County



South of Blountstown



Severe
Timber
Damage



Calhoun County Highway 20



Calhoun County west of Clarksville



Calhoun County Highway 20



I-10 South Side Weigh Station Jackson County



Timber Damage Sneads



Timber Damage Thinned Plantation Grand Ridge

Moderate and Light Timber Damage



I-10 West Greesboro



Pine Log State Forest



Young Long Leaf Pine Plantation Washington County



South of Hosford