Results of Aerial Surveys of Forested Lands Damaged by Hurricanes Katrina and Rita in Southeast and Southwest Parishes, Louisiana

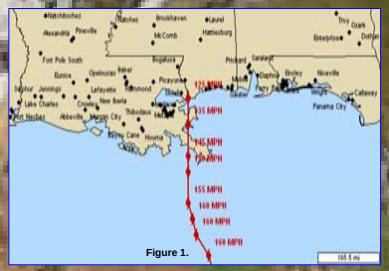

Figure 1.

On August 29, 2005 Hurricane Katrina hit the eastern Gulf Coast region of Louisiana (Figure 1.) and then made its way north affecting the entire Southeastern portion of the State. The areas affected most by hurricane Katrina represent a large portion of Louisiana's fisheries, dairy, sugarcane, forestry, wildlife, vegetable, nursery and citrus industries. In many cases, the high winds and flood waters completely devastated these industries. Shortly after the storm Louisiana Department of Agricultural and Forestry requested assistance from the USDA Forest Service, Southern Region, Forest Health Protection (FHP), Alexandria Field Office, to conduct an aerial survey of forest damage caused by Hurricane Katrina. Three parishes in the southeastern part of the state severely impacted by Katrina were selected for assessment. The objective of this survey was to determine the location, amount (acreage) and extent (severity) of forest resources damaged by the storm.

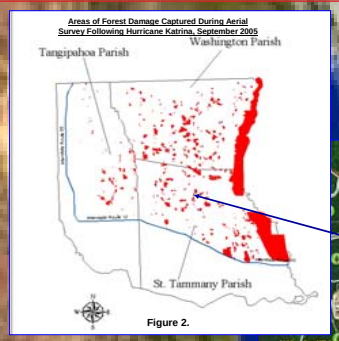

Figure 2.

The aerial survey revealed a total estimated area of 159,435 ac. of forestland suffered varying degrees of damage, with most of the damage occurring in Saint Tammany and Washington Parishes and tapering off in the western part of Tangipahoa Parish (Figure 2). Of this area, 3,127 ac. were classified as Scattered Light; 10,752 ac. as Light; 84,124 ac. Moderate; and 61,432 ac. classified as Severe (Table 1).

Table 1. Estimated acres damaged by severity and forest type for three Louisiana Parishes severely affected by Hurricane Katrina in August/September 2005. Results are based on aerial survey using Digital Aerial Sketchmapping to delineate damaged areas.

	Damage Category (Acres)					
Forest Type	Scattered Light	Light	Moderate	Severe	Totals	
Bottomland Hardwood	945	4591	55383	39965	100884	
Mature Pine	1398	2372	24403	19360	47533	
Pine Hardwood Mix	794	2614	3843	2128	9379	
Pine Plantation	0	1175	779	609	2563	
Total	3137	10752	84124	61432	159445	

GoogleEarth® virtual image map looking north towards Abita Springs, Louisiana showing polygons of damaged areas captured during this aerial survey.

Figure 3.

Sketch-mapping. Aerial sketch-mapping is the geo-locating of features observed on the ground from an aerial platform and subsequent recording of these features on maps or photographs. The use of the Digital Aerial Sketchmapping System (Figure 3.) allows for automatic tracking of the position of the aircraft on the map base by means of a link to a GPS receiver. This results in a substantial increase in accuracy and reduction of time spent digitizing, because the digital product is created during aerial data acquisition.

The rapid assessment nature of this survey provided a "quick capture" of the most notable and obvious areas of damage. Observation from the air indicated that hardwood forests suffered somewhat heavier damage than did the pine forests. Of the pine forests, open grown pines and young plantations suffered the most severe damage. Open pine stands were characterized by extensive windthrow and breakage, and young plantations had a high proportion of leaning trees. Hardwood bottomland forests in the areas of heavy damage (e.g., the Pearl River Basin) predominantly exhibited near total windthrow and/or complete defoliation.

Aerial estimates of the acreage of timber damage in the surveyed area are subject to increase from ground surveys. This is particularly true of the Scattered Light and Light categories not easily distinguishable from the air. In addition, due to the limitations of aerial observations, hurricane damage such as limb breakage, root injury, moderate defoliation, twisted trunks, flooding and salt damage are not visible from the air and, consequently, not accounted for in this survey.

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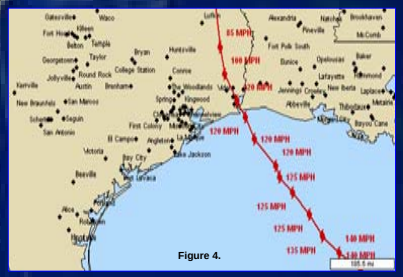

Figure 4.

On September 24, 2005 Hurricane Rita hit the Western Gulf Coast region of Louisiana (Figure 4.) and then made its way northeast affecting east Texas. The areas affected most by hurricane Rita represent a large portion of Louisiana's fisheries, dairy, sugarcane, forestry, wildlife, vegetable, nursery and citrus industries. In many cases, the high winds and flood waters completely devastated some of these industries. Shortly after the storm Louisiana Department of Agricultural and Forestry requested assistance from the USDA Forest Service, Southern Region, Forest Health Protection (FHP), Alexandria Field Office, to conduct an aerial survey of forest damage caused by Hurricane Rita. Four parishes in the southwestern part of the state impacted by Rita were selected for assessment. The objective of this survey was to determine the location, amount (acreage) and extent (severity) of forest resources damaged by the storm.

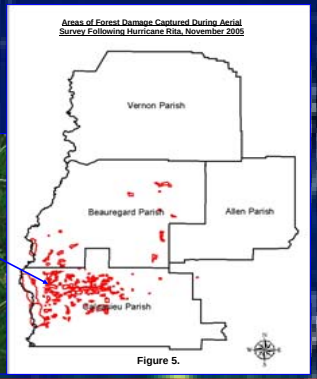

Figure 5.

The aerial survey revealed a total estimated area of 69,458 ac. of forestland exhibiting varying degrees of damage, with most of the damage occurring in Beauregard and Calcasieu Parishes (Figure 5.). There were no significant areas of detectable/sketchable forestland damage in Vernon and Allen Parish. Of the total damage observed, 25,942 ac. were classified as Scattered Light; 18,001 ac. as Light; 24,471 ac. Moderate; and 1,044 ac. classified as Severe (Table 1).

Table 1. Estimated acres damaged by severity class and forest type for the four Louisiana Parishes severely affected by Hurricane Rita in September 2005. Results are based on aerial survey using Digital Aerial Sketch-mapping to delineate damaged areas.

	Damage Category (Acres)					
Forest Type	Scattered Light	Light	Moderate	Severe	Totals	
Bottomland Hardwood	20445	10051	16951	0	47447	
Mature Pine	1900	5740	5443	584	13667	
Pine Hardwood Mix	1607	1216	2077	0	4900	
Pine Plantation	2982	994	0	0	3976	
Total	25942	18001	24471	584	69958	

GoogleEarth® virtual image map looking from Lake Charles north towards DeQuincy, Louisiana showing polygons of damaged areas captured during this aerial survey.