

Clear Cut or Salvage Cut: That is the Question after Hurricane Rita

October 6, 2005

Contact: Dr. Weihuan Xu, Principal Economist, wxu@tfs.tamu.edu

On September 24, 2005, Hurricane Rita, a category 3 hurricane, struck Southeast Texas causing damage to timberland in 17 counties. Orange, Newton, Jefferson and Jasper Counties were the hardest hit. Timberland owners are facing problems with how to deal with the damaged trees and manage the remaining timberland. Texas Forest Service is providing some guidelines for decision-making and some useful resources to help the landowners in this difficult situation.

Steps to Go Through:

The landowner will first need to assess the damage to the stand. Landowners will most likely need the help of a professional forester. The assessment should include the number, volume and value of trees by size and the degree of damage.

Removal of the damaged trees is necessary in most cases. The damaged trees are fire hazards; they may also induce insects and disease. In cases where the trees are old enough for commercial grades, removal of the damaged trees makes short-term economic sense. Trees that are uprooted, broken with 1/3 or more of their crown gone, or bent or bowed over more than 45 degrees need to be removed. Trees with only minimal broken tops can be kept. If the stand is in need of thinning, it is generally a good idea to do it with the removal of the damaged trees. In some cases, some undamaged trees will need to be included to make the sale marketable. However, with so much damaged trees in the area, such decisions need to take into account currently depressed timber prices.

After a damage assessment, landowners can contact consulting foresters or wood buyers for selling and removing the damaged trees.

The price that a landowner receives for his timber may be different from the prices listed in the *Texas Forest Service Price Trends* for several reasons. The large quantity of damaged trees from the hurricane put a huge pressure on the market and will reduce timber prices in the short term. The prices for local markets may vary by location and the demand for timber grades. Also, damaged timber will likely be worth less than undamaged timber.

A Hard Decision to Make:

Should affected timber be clear-cut and replanted, or should just the damaged trees be salvaged, allowing the rest of the trees grow? The answer depends on many factors, such as the severity of the damage, the stand age and the productivity of the land. Table 1 gives a summary of the minimum number of trees per acre (TPA) for each age class of a loblolly pine stand. The numbers may vary with land productivity. Under normal

management, stands should maintain more trees than the minimum TPA for each age class in the table. However, that does not necessarily mean that land should be clear-cut and replanted whenever the number of trees falls under the minimum. Because of the establishment costs of pine plantation, prematurely clearing land always means substantial financial losses that may not be recoupable from the reestablished stand. Studies have shown that with good vegetation control, fewer trees per acre can still produce reasonable financial returns for pine plantations.

Landowners should consider using two-thirds of the minimum TPA as the cut-off point for land clearance. Again, the numbers may vary with land productivity. The remaining trees must be well spaced, healthy and have the potential to grow into high quality sawlogs. With fewer trees per acre, the stand is prone to competition from hardwood and other vegetation. Vegetation control is a must for healthy growth of the pine trees and reasonable financial returns. For stands older than 20 years, since most of the trees are of commercial grade size, there is more flexibility in determining whether or not to clear the land. If there are enough healthy trees left (maybe less than 100 per acre) to grow into sawlog grade in a few years, landowners may consider keeping them and clearing only the damaged ones. On the other hand, if cutting all trees can generate substantial financial return and the damage is severe, landowners may want to harvest the timber and start over.

Table 1. Minimum trees per acre by age class for loblolly pine stands in East Texas

Age class	Min TPA	2/3 of Min TPA
1-5	300	200
6-10	250	167
11-15	200	133
16-20	150	100

Table 2 compares the simulated financial returns between removing all trees now and keeping two-thirds of the minimum TPA until maturity for a loblolly pine stand. Two financial parameters are given in the table: Net Present Value (NPV) and Internal Rate of Return (IRR). The NPV is the net of all positive and negative cash flows discounted back to the beginning of the stand establishment; the higher the NPV, the better the investment. The IRR is the discount rate that sets the NPV of a series of cash flows equal to zero. It tells what the compound rate of return is on the investment; the higher the IRR, the better the investment. The basic assumptions of the management scenarios are as follow:

- Site index: 65 (based on age 25)
- Trees/acre at year one: 500
- Discount rate: 5%
- Pulpwood price: \$10/ton
- Chip-n-saw price: \$25/ton
- Sawlog price: \$45/ton

Regeneration cost: \$180/acre

Annual regular cost: \$5/acre

Herbicide broadcast release cost: \$80/acre

Maturity age: 30

At maturity, assuming 20% of the sawlog and chip-n-saw volume becomes pulpwood because of the broken tops.

From table 2, the financial returns of keeping a minimum number of trees until maturity are better than removing all trees at all given ages. The financial returns of removing all trees improve with the increase of age, which makes decisions about removing all or keeping some after year 20 more flexible. Note that the same prices were used to compute the financial returns for both sets of scenarios. In reality, the timber harvested may not get the normal price due to the price pressure from large amount of hurricane damaged trees. One may argue that it may be financially feasible to keep trees less than two-thirds of the minimum TPA. However, too few trees per acre may reduce the quality of sawlogs produced in terms of more knots and bad form, which in turn affect the financial returns from the timberland.

Table 2. Comparison of the financial returns of the two management options

Age	Remove all trees at the given age		Keep 2/3 of the min. TPA until Year 30 with herbicide broadcast release right after removal	
	NPV (\$)	IRR (%)	NPV (\$)	IRR (%)
5	-206.65	Negative	265.34	7.52
10	-135.85	Negative	286.87	7.93
15	16.79	5.53	359.76	8.94
20	176.54	8.17	408.28	9.41

Each tract of timberland is different. Landowners may use the Timberland Decision Support System (TDSS): <http://tfsfrd.tamu.edu/> from Texas Forest service to run scenarios for each tract of land to decide what is the best decision.

Useful Resources:

Timberland Decision Support System (TDSS):

<http://tfsfrd.tamu.edu/>

Recent and historical timber prices:

<http://txforests-service.tamu.edu/forest/economics/default.asp>

Texas Forest Service offices in your area:

<http://txforests-service.tamu.edu/contacts/default.asp>

Professional consulting forester list:

http://texasforests-service.tamu.edu/pdf/forest/landowner_assistance/referral.pdf

Professional loggers list:

<http://www.texasforestry.org/database.asp>

Wood buyers list:

<http://tfsfrd.tamu.edu/fpd/fpdx.asp>