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Bishop Tract
Timber Inventory and Appraisal

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BISHOP

30°49'4.92"N
93°47'53.46"W

Summary

The Bishop property is a forested tract of land that is predominantly pine (85% of the trees). The stand is relatively young, trees relatively small (average dbh is 7.4") and stocking levels moderate (124 trees per acre and 41 square feet per acre basal area).

The current total estimated timber volume is 4,885 tons (82% pine). The average per acre volume is 32 tons. Pine Pulpwood accounts for 62 % of the trees and 30% of the volume.

The current estimated timber value is $50,041 (pine accounts for 89% of the value). The average per acre value is $345. *Note: the timber market is currently depressed and prices are lower than normal for recent years.*

The 5-year projected pine timber volume and value (assuming constant prices) is **5,235 tons** and **$64,996** (2013).

Location and Site

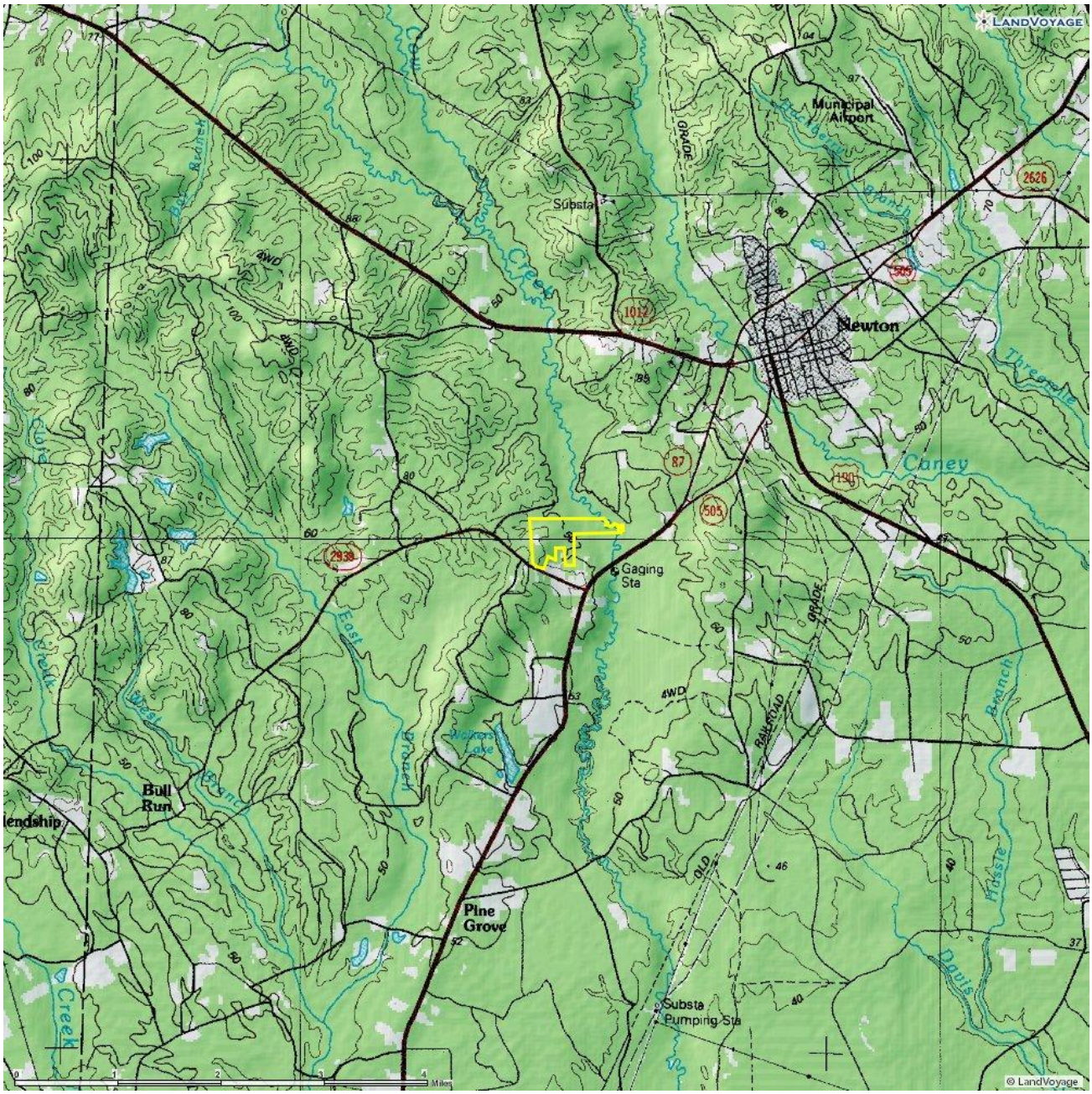
The 145-acre Bishop tract is located in Newton County, Texas on FM 2939 approximately 3 miles southwest of the town of Newton.

The GPS coordinates reference an access road at FM 2939.

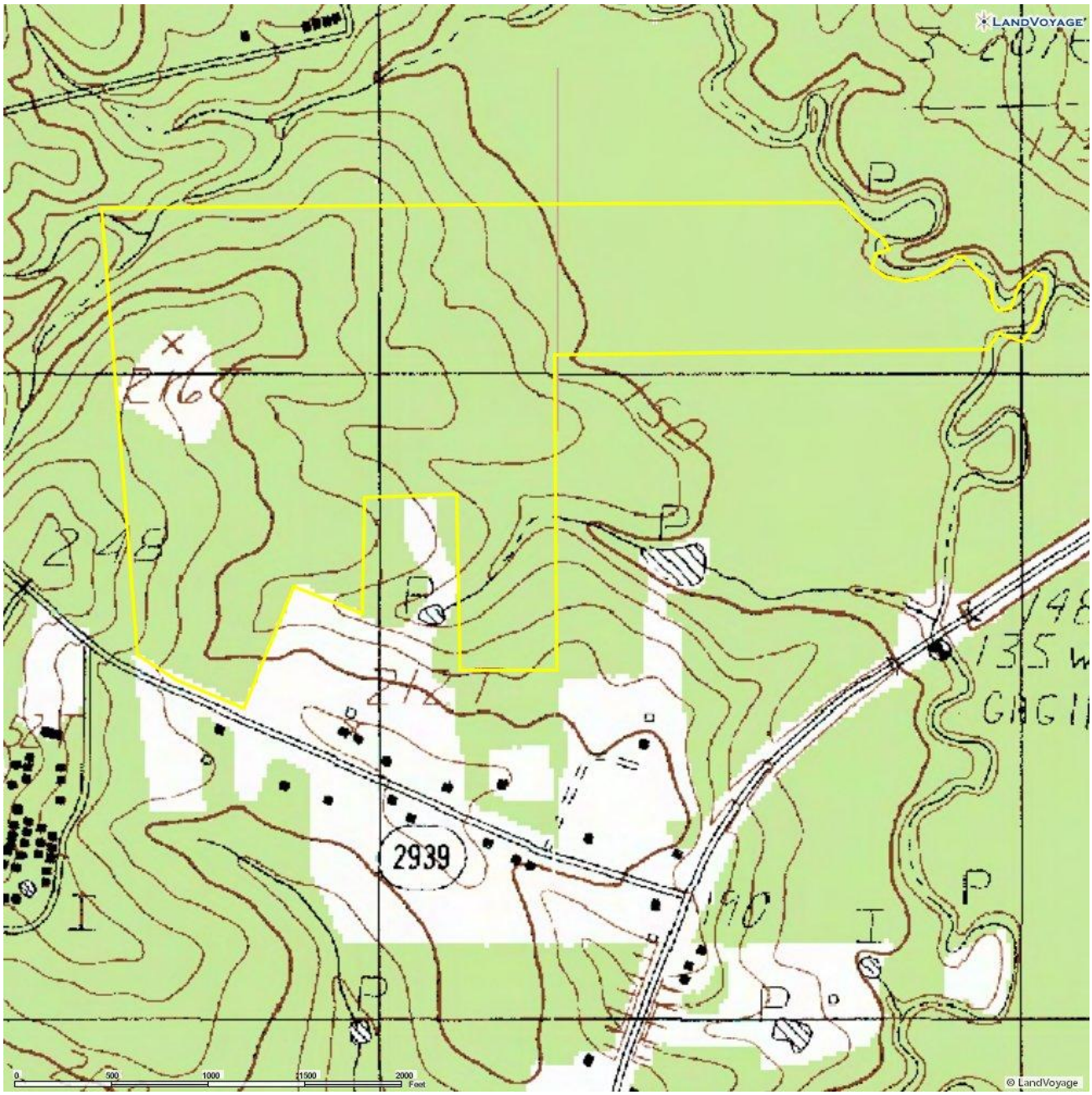
The land is gently sloping (generally less than 5%) from west to east toward Cow Creek which forms the northeastern boundary. The "panhandle" that extends to Cow Creek is level. The high point, located roughly 500' north of the southwestern corner, is roughly 230' above mean sea level. The low point near the east-southeastern corner (along Cow Creek) is approximately 140' above mean sea level. The tract is located in the Sabine River Watershed.

Soil and site characteristics are favorable for pine timber production. Most of the acreage is comprised of fine sandy loam or loamy fine sand soils with average to above average loblolly pine productivity.

Bishop Tract – Location Map



Bishop Tract – Topographic Map



Bishop Tract – Soil Survey Map

DUB – Doucette-Boykin loamy fine sand to 24”, sandy clay loam to 80”
well drained, moderate available water capacity
7 acres, 19% of tract, SI 66

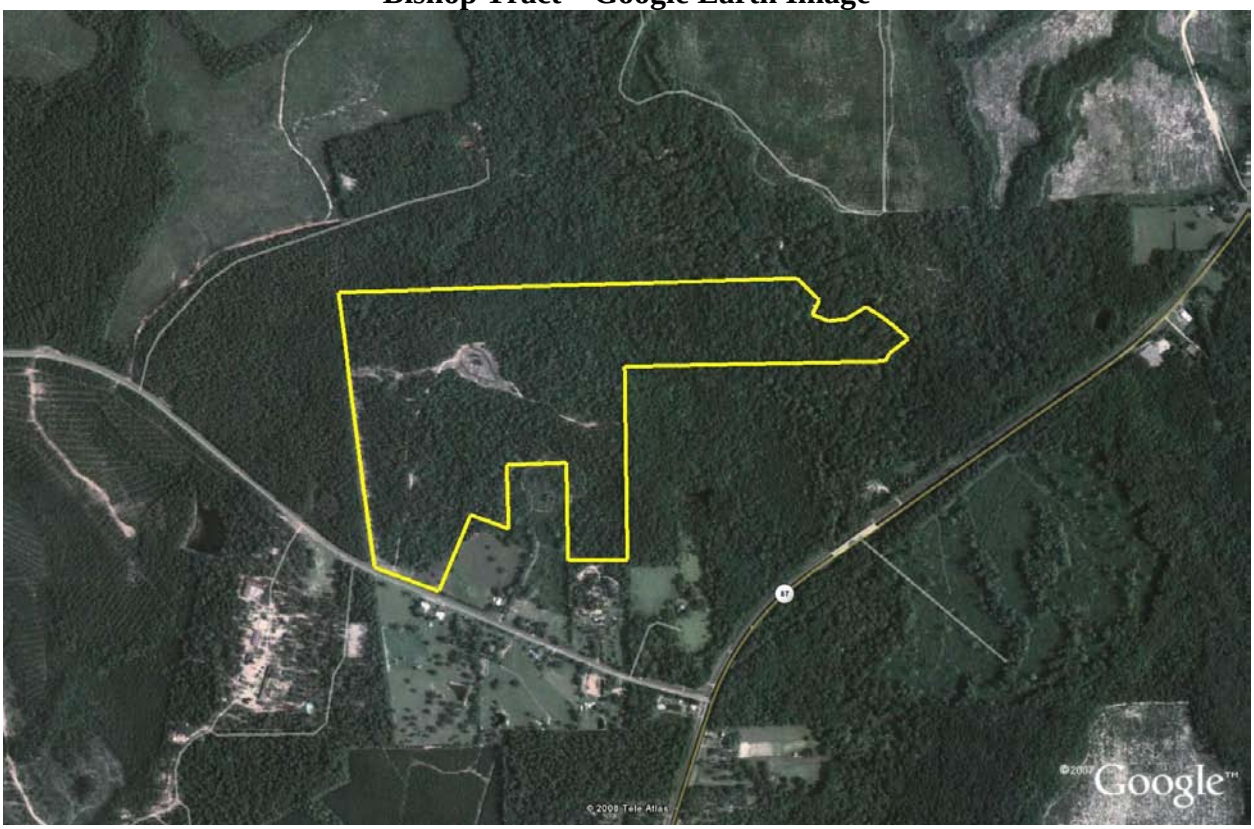
Lu - Luka fine sandy loam to 68”
moderately well drained, moderate available water capacity
9 acres, 6% of tract, SI 85

Mn – Mantachie-Bleakwood fine sandy loam to 3”, loam to 72”
poorly drained, high available water capacity
31 acres, 21% of tract, SI 90

PlC – Pinetucky-Doucette loamy fine sand and fine sandy loam to 24”/13”, sandy clay loam below
moderately well drained, high available water capacity
78 acre, 54% of tract, SI 85

SI = *Site Index and refers to the expected average height of dominant and codominant loblolly pine trees at year 50*

Bishop Tract – Google Earth Image



Bishop Tract – 2004 NAIP CIR Aerial Photograph

The timber inventory data were collected from 35 sample points distributed across the merchantable acreage. Timber product specifications are as follows:

Pine Sawlogs = at least 13.6" dbh with a minimum 8" top diameter(inside bark), 20' minimum length, bole must be relatively straight, clear of excessive or large limbs and knots and free of decay or other defect.

Pine Small Sawlogs = 11.6" to 13.5" dbh with a minimum 8" diameter top, 20' minimum length, bole must be relatively straight, clear of excessive or large limbs and knots and free of decay or other defect.

Pine Chip-N-Saw = at least 7.6" dbh with a minimum 8" diameter top, 25' minimum length, bole must be relatively straight, clear of excessive or large limbs and knots and free of decay or other defect.

Pine Pulpwood = at least 4.6" dbh with a minimum 3" diameter top, 16' minimum length, bole must be free of decay or extreme defect.

Hardwood Sawlogs = at least 11.6" dbh with a minimum 9" diameter top, 16' minimum length, bole must be relatively straight, clear of excessive or large limbs and knots and free of decay or other defect.

Hardwood Pulpwood = at least 4.6" dbh with a minimum 3" diameter top, 16' minimum length, bole must be free of decay or extreme defect.

Timber data include Species, DBH, Merchantable Height and Product. Volume was calculated in green tons using TCruise ver. 5.0 Equation 102 (Messavage-Girrad Form Class Volume Tables) and Form Class 80. Topwood was calculated for Pine only.

The 95% confidence interval for the total pine volume estimate is ± 16.7% and for total pine value is ± 20.5%.

Bishop Tract — Merchantable Timber (145 acres)

PRODUCT	***TONS***	***DOLLARS***	***$/TON***
pine pulpwood	1,425	$5,698	$4.00
pine topwood	500	$2,000	$4.00
pine chip-n-saw	1,110	$13,321	$12.00
pine small sawlogs (11.5" to 13.5" dbh)	767	$12,728	$24.00
pine sawlogs (>13.5" dbh)	260	$10,666	$38.00
Total Pine	**4,062**	**$44,413**	**$10.93**
hardwood pulpwood	677	$2,707	$4.00
hardwood sawlogs	146	$2,921	$20.00
Total Hardwood	**823**	**$5,628**	**$6.84**
TOTAL	**4,885**	**$50,041**	**$10.24**

Tree Abundance and Distribution

The forest is comprised of 85% pine trees and 15% hardwood trees. The most abundant timber product category is PINE PULPWOOD accounting for 62% of the trees**. The average total number of trees is 124 per acre,** indicating moderate stocking. Loblolly Pine is the predominant species. Shortleaf Pine and Longleaf Pine are also present. The most common hardwood species are oaks (Southern Red Oak, Water Oak and White Oak), gum (Sweetgum) and hickory.

Pine trees are distributed throughout the tract being tallied at each of the sample points except in the cleared area in the north-central portion of the property (see Google Earth Image on Page 6). Hardwood trees were not tallied at over ½ of the sample points and less than two hardwood trees were tallied at over ¾ of the sample points.

Stand Density

Stand density is an indication of crowding and is measured by basal area (defined as the sum of the cross-sectional area of all trees on one acre). The calculation of basal area is a function of the **number** and **size** of trees in the forest.

Pine trees comprise 80% of the average stand density, hardwood 20%. Trees in the PINE PULPWOOD category account for only 39% of the stand density (even though 62% of the trees are PINE PULPWOOD). **The average total basal area for all trees in the merchantable stands is 41 square feet per acre,** indicating low stand density.

The average tree measures 7.4" dbh. Pine trees average 7.2" and hardwood trees average 8.7".

Timber Volume

Tree height and form are added to the function to calculate timber volume. Pine timber accounts for 82% of the total timber volume, hardwood 18%. PINE PULPWOOD trees account for 30% of the total volume. The 2nd most prominent timber product category is CHIP-N-SAW contributing 24%.

PINE TOPWOOD is added to the analysis for the timber volume and value distributions. Topwood is derived from the sawlog trees (and chip-n-saw) and is the portion of the tree that is utilized for pulpwood after sawtimber is merchandized. Hardwood topwood volume is not estimated in this analysis.

The average total timber volume is 32 tons per acre, slightly more than 1 truckload per acre.

Timber Value

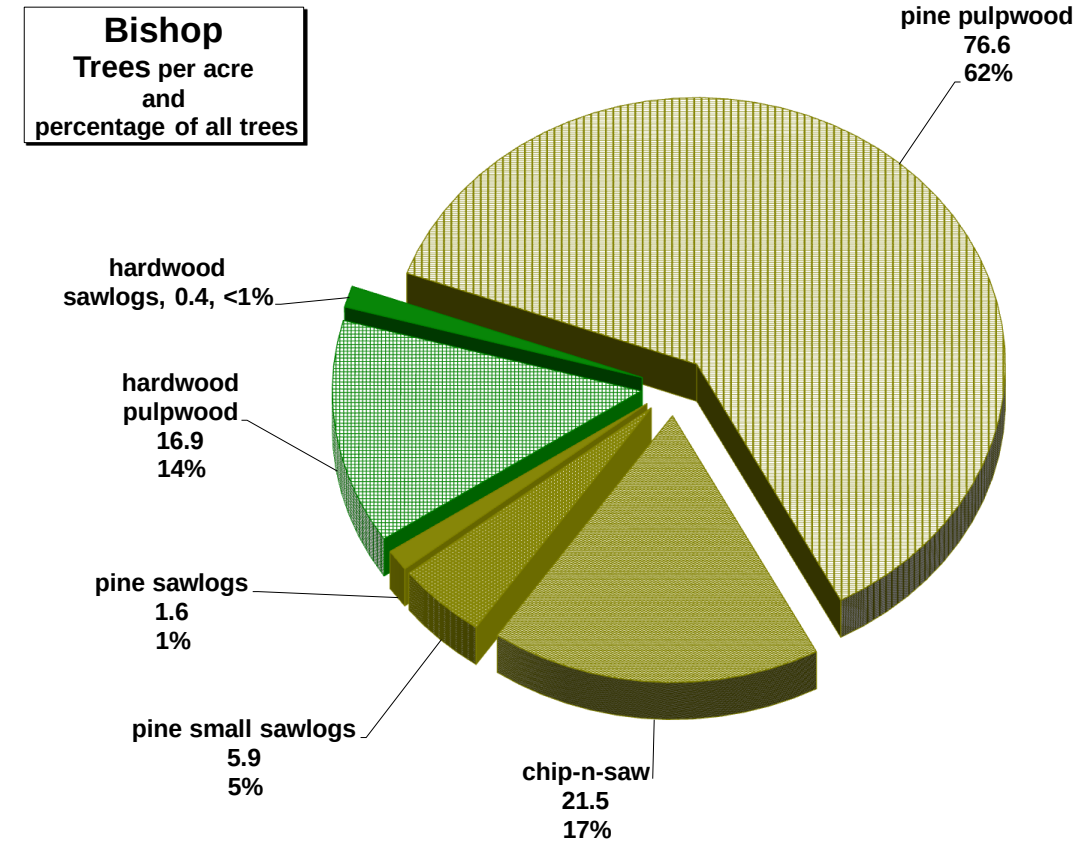
Timber value is assigned to the timber volume in a stair-stepped manner. That is, value increases at an uneven rate with jumps that are triggered by product thresholds rather than by gradual gradations. Some smoothing of the value to volume and tree size ratio is realized in "log sorts" offered (or required) by certain mills but "blended" pricing is more practical for inventory and appraisal studies.

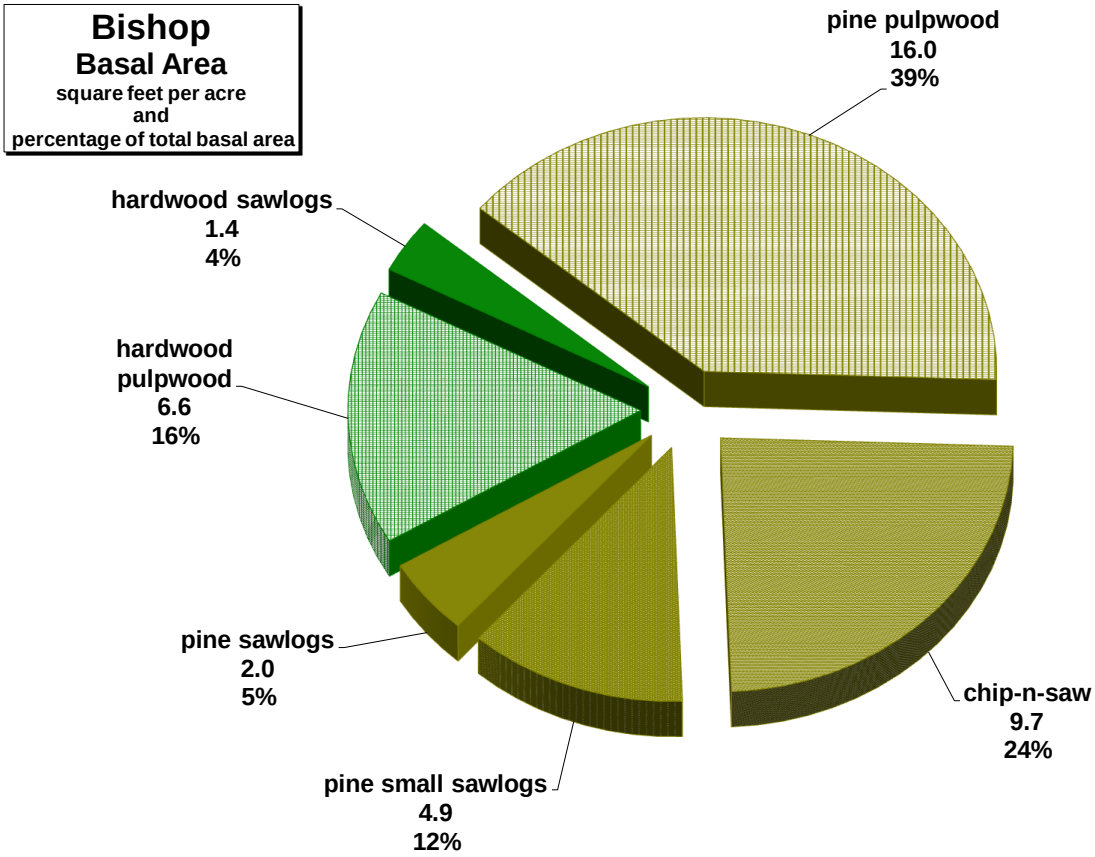
Pine trees account for 89% of the timber value, hardwoods 11%. Trees classified in the two pine sawtimber categories (plus their topwood) account for 49% of the total timber value. **The average total timber value for all trees in the merchantable stands is $345 per acre.**

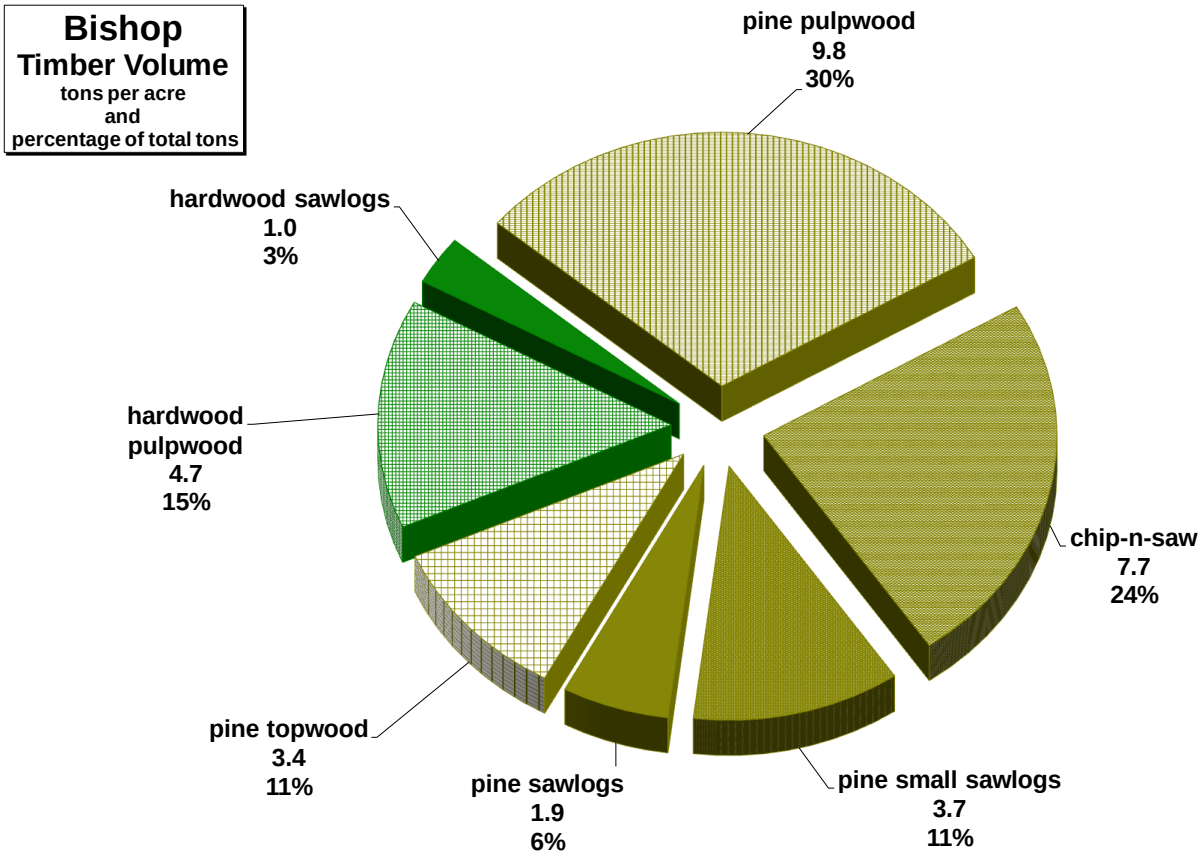
Timber Inventory Summary for Bishop Tract

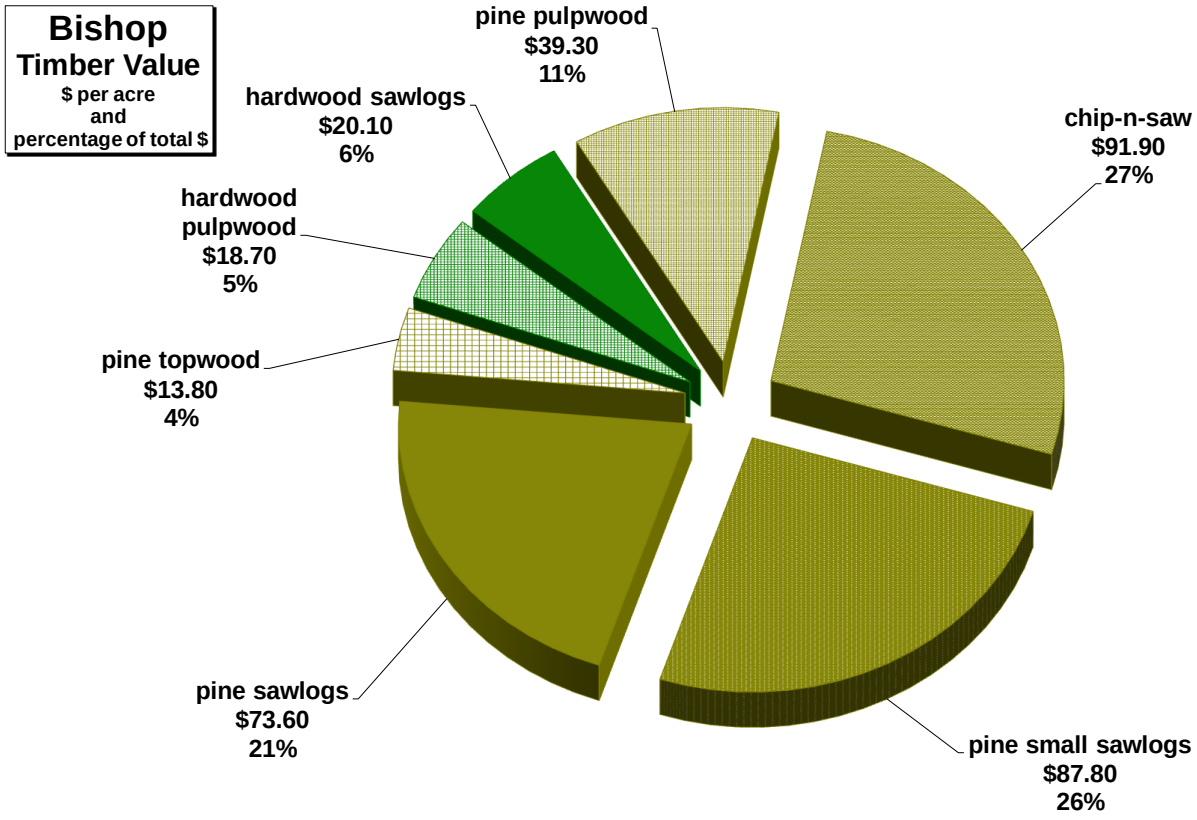
145 acres		*per acre*				
		trees	basal area	tons	stumpage	dbh
Loblolly	pine pulpwood	76.6	16.0	9.8	$39.30	6.1
	chip-n-saw	21.5	9.7	7.7	$91.90	9.0
	pine small sawlogs	5.9	4.9	3.7	$87.80	12.3
	pine sawlogs	1.6	2.0	1.9	$73.60	15.2
	pine topwood			3.4	$13.80	
	total	**105.6**	**32.6**	**26.5**	**$306.40**	**7.2**
Hardwood	hardwood pulpwood	16.9	6.6	4.7	$18.70	8.3
	hardwood sawlogs	1.6	1.4	1.0	$20.10	12.7
	total	**18.5**	**8.0**	**5.7**	**$38.80**	**8.7**
Total		**124.1**	**40.6**	**32.2**	**$345.20**	**7.4**

145 acres		*tract total*			
		trees	basal area	tons	stumpage
Loblolly	pine pulpwood	11101	2320	1425	$5,698
	chip-n-saw	3118	1409	1110	$13,321
	pine small sawlogs	856	704	767	$12,728
	pine sawlogs	228	290	260	$10,666
	pine topwood			500	$2,000
	total	**15303**	**4723**	**4062**	**$44,413**
Hardwood	hardwood pulpwood	2456	953	677	$2,707
	hardwood sawlogs	236	207	146	$2,921
	total	**2692**	**1160**	**823**	**$5,628**
Total		**17995**	**5883**	**4885**	**$50,041**


Bishop
Trees per acre
and
percentage of all trees
pine pulpwood
76.6
62%
hardwood
sawlogs, 0.4, <1%
hardwood
pulpwood
16.9
14%
pine sawlogs
1.6
1%
pine small sawlogs
5.9
5%
chip-n-saw
21.5
17%


Bishop
Basal Area
square feet per acre
and
percentage of total basal area
pine pulpwood
16.0
39%
hardwood sawlogs
1.4
4%
hardwood
pulpwood
6.6
16%
pine sawlogs
2.0
5%
pine small sawlogs
4.9
12%
chip-n-saw
9.7
24%


Bishop
Timber Volume
tons per acre
and
percentage of total tons
pine pulpwood
9.8
30%
hardwood sawlogs
1.0
3%
hardwood
pulpwood
4.7
15%
chip-n-saw
7.7
24%
pine topwood
3.4
11%
pine sawlogs
1.9
6%
pine small sawlogs
3.7
11%


Bishop
Timber Value
$ per acre
and
percentage of total $
pine pulpwood
$39.30
11%
hardwood sawlogs
$20.10
6%
chip-n-saw
$91.90
27%
hardwood
pulpwood
$18.70
5%
pine topwood
$13.80
4%
pine sawlogs
$73.60
21%
pine small sawlogs
$87.80
26%

Bishop Tract — **Pine** Stock & Stand Table

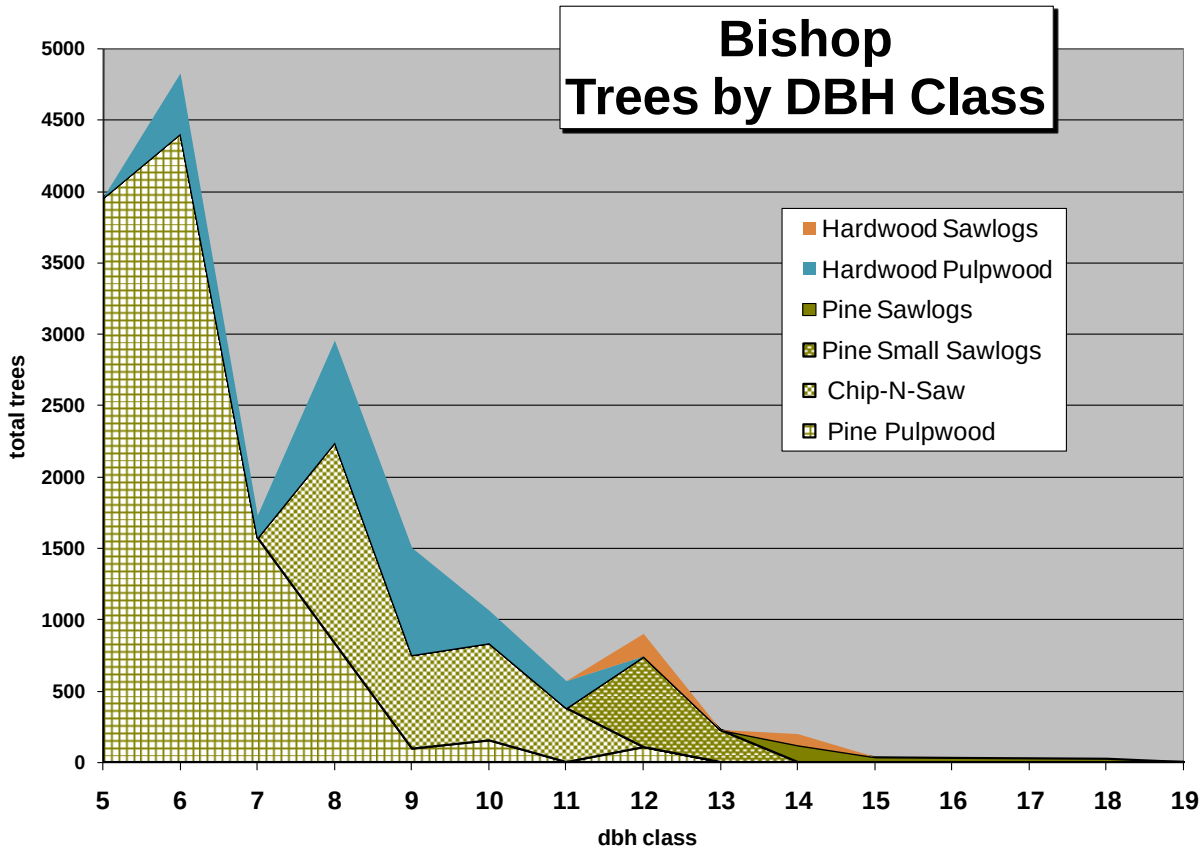
145 acres

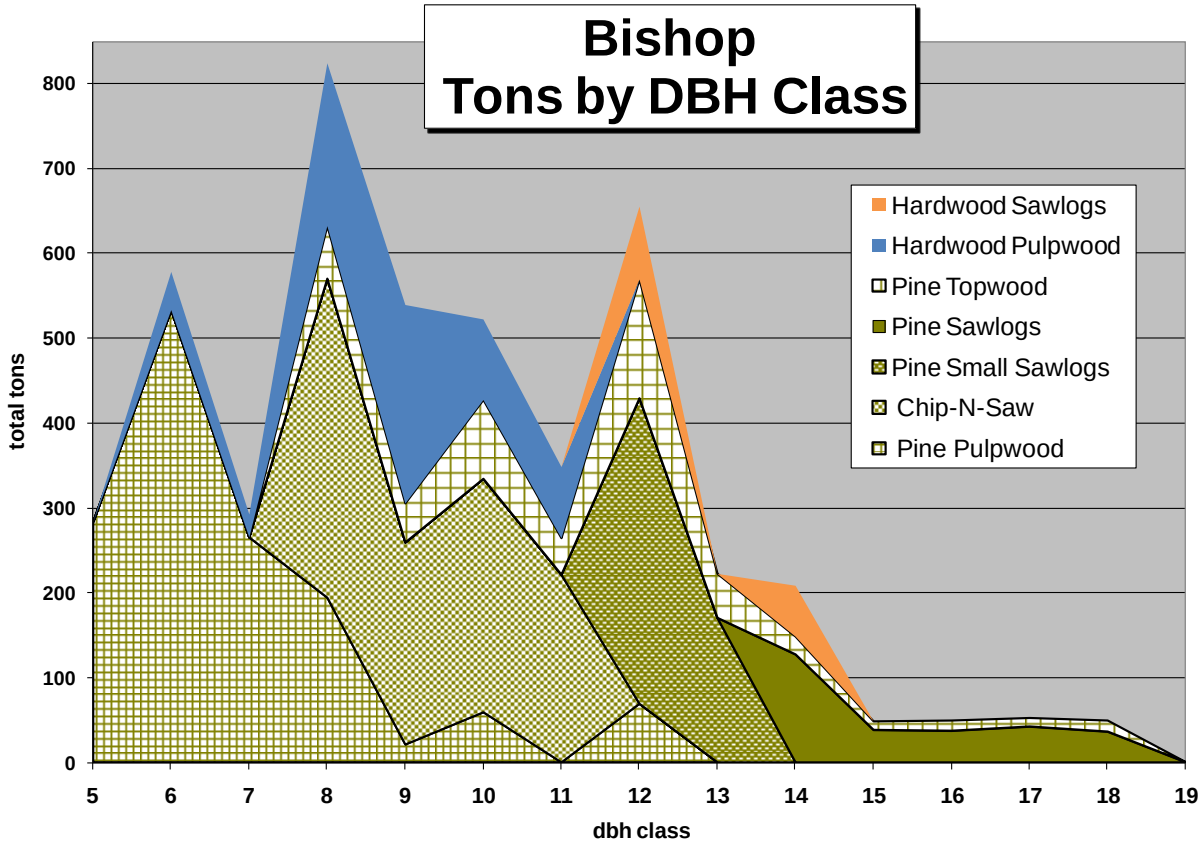
	Total Pine		Pulpwood		Chip-N-Saw		Small Sawlogs			Sawlogs			Topwood
DBH	trees	tons	trees	tons	trees	tons	trees	sawlog tons	avg. log. height	trees	sawlog tons	avg. log. height	tons
5	3950	283	3950	283									
6	4400	533	4400	533									
7	1570	265	1570	265									
8	2238	570	831	194	1407	376							62
9	748	259	94	21	654	238							46
10	831	334	152	59	679	275							93
11	377	221			377	221							43
12	738	429	105	69			633	360	33				140
13	223	170					223	170	40				52
14	116	127								116	127	54	21
15	33	38								33	38	46	10
16	29	37								29	37	43	12
17	26	42								26	42	51	10
18	23	36								23	36	41	13
19	0	0											0

Hardwood Stock & Stand Table

145 acres

	Total Hardwood		Pulpwood		Sawlogs	
DBH	trees	tons	trees	tons	trees	tons
5	0	0				
6	422	45	422	45		
7	155	27	155	27		
8	712	192	712	192		
9	750	234	750	234		
10	228	95	228	95		
11	188	84	188	84		
12	158	86			158	86
13	0	0				
14	78	60			78	60
15	0	0				
16	0	0				
17	0	0				
18	0	0				
19	0	0				


Bishop
Trees by DBH Class
total trees
dbh class
Hardwood Sawlogs
Hardwood Pulpwood
Pine Sawlogs
Pine Small Sawlogs
Chip-N-Saw
Pine Pulpwood


Bishop
Tons by DBH Class
total tons
dbh class
Hardwood Sawlogs
Hardwood Pulpwood
Pine Topwood
Pine Sawlogs
Pine Small Sawlogs
Chip-N-Saw
Pine Pulpwood

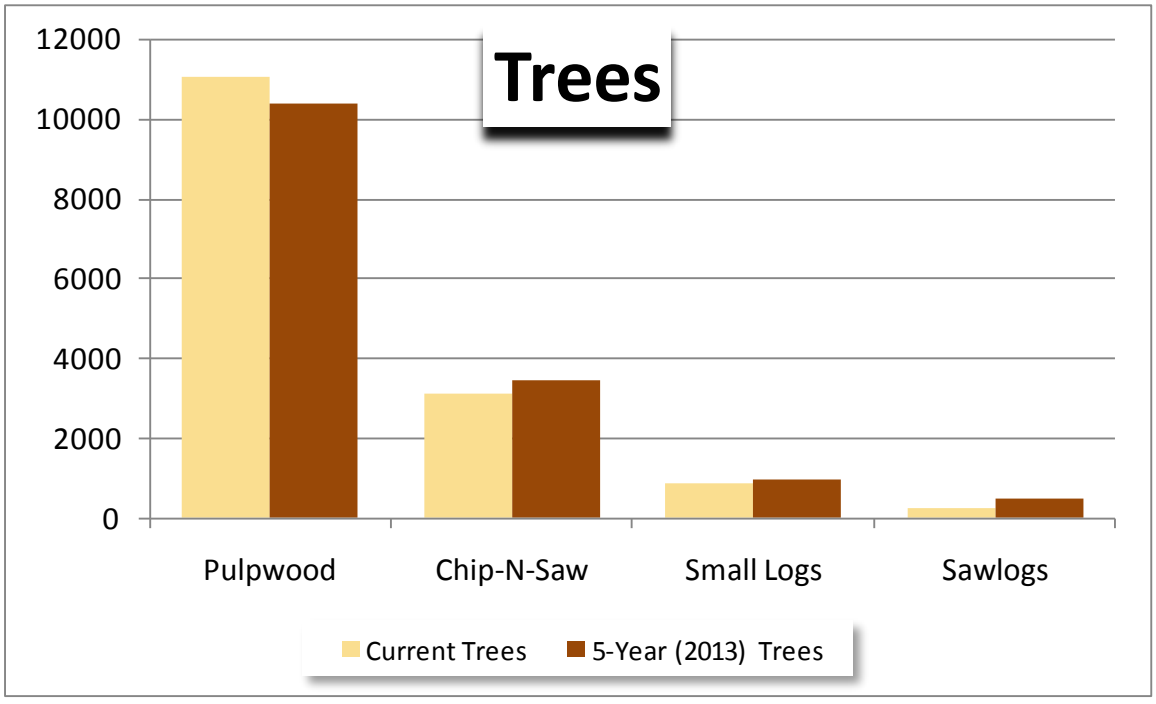
Growth Projection

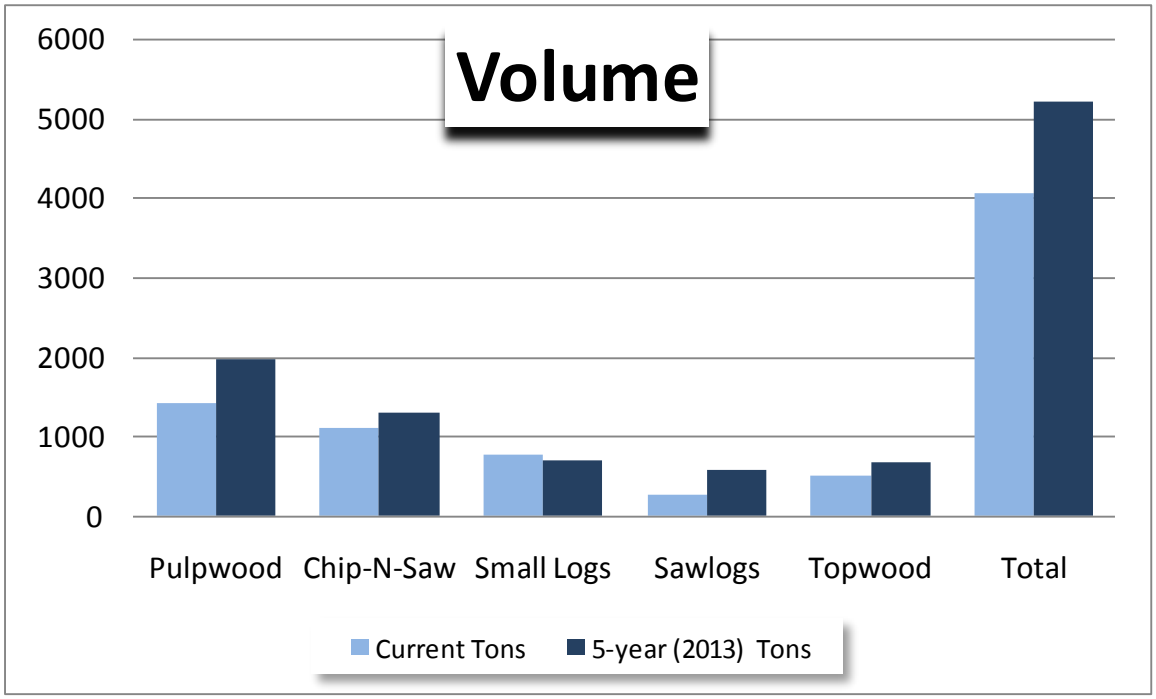
Growth measurements (5-year radial growth) were taken from 15 pine trees and used in the TCruise projection model to estimate Timber Product distribution, volume and value in 5 years (2013). The projection assumes constant timber prices. Projections are for **PINE ONLY**.

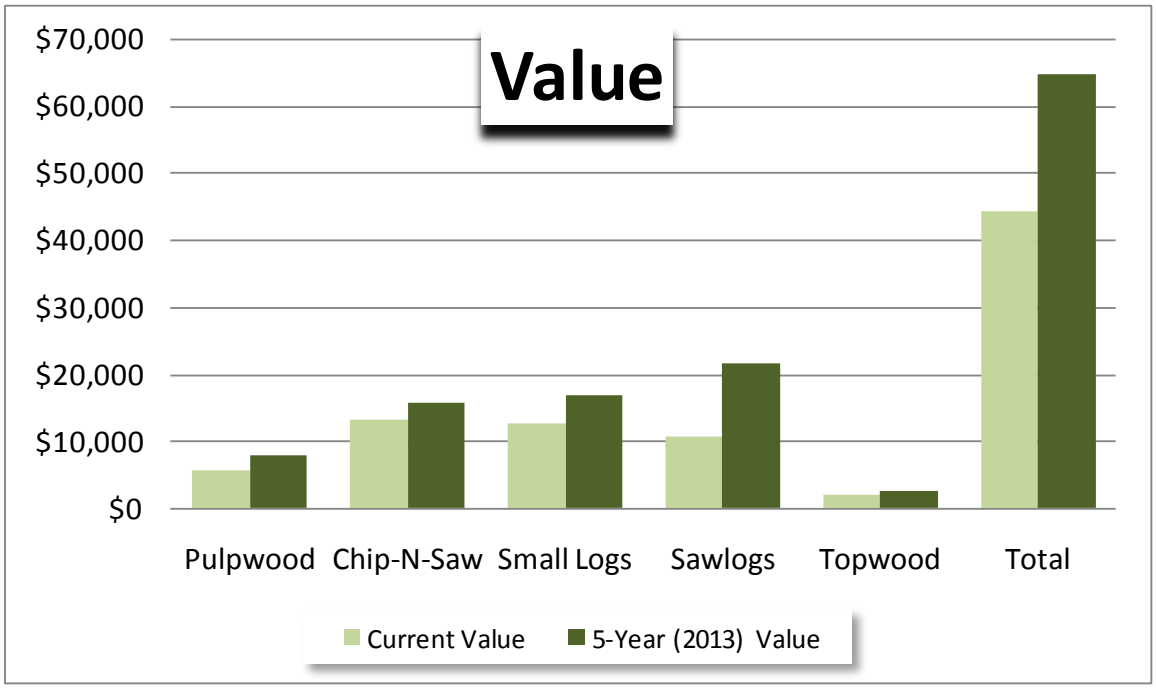
The increase for the 145 acres is **1,173 tons** (**29%** in 5 years) and **$20,583** (**46%** in 5 years) for the **pine** timber. The increase in value is both a function of a shift from lower value products (like Pulpwood and Chip-N-Saw) to higher value products as well as the growth in volume**.** The projected volume and value of the **pine** timber in **2013** is **5,235 tons** and **$64,996.**

Bishop 5-year projection

		Pulpwood	Chip-N-Saw	Small Logs	Sawlogs	Topwood	Total
5-year 2013	Trees	10438	3447	946	472		15303
	Tons	1987	1304	707	573	664	5235
	Value	$7,949	$15,643	$16,978	$21,771	$2,655	$64,996
current	Trees	11101	3118	856	228		15303
	Tons	1425	1110	767	260	500	4062
	Value	$5,698	$13,321	$12,728	$10,666	$2,000	$44,413




Volume
6000
5000
4000
3000
2000
1000
0
Pulpwood
Chip-N-Saw
Small Logs
Sawlogs
Topwood
Total
Current Tons
5-year (2013) Tons


Value
$70,000
$60,000
$50,000
$40,000
$30,000
$20,000
$10,000
$0
Pulpwood
Chip-N-Saw
Small Logs
Sawlogs
Topwood
Total
Current Value
5-Year (2013) Value

The average pine tree diameter increases from 7.2" to 7.9" dbh. The percentage of trees in the two pine sawtimber categories increases from 7% to 9%, indicating the tract is more than 5 years away from a final or a substantial harvest (probably 10 years – 2018).

Forest Management Recommendations

The forest is young, trees are small and stocking levels are moderate. Evaluate the stand for a *First Thinning* in 5 years (2013). A more substantial harvest may be expected in approximately 10 years. No immediate action is needed. There is a small clearing near the center of northern half of the tract (slightly over 2 acres). Pine seedlings could be planted in this area; however, given the small size and the extensive forest coverage on the remainder of the acreage it is not critical to replant (natural seeding will probably occur anyway if the clearing is not maintained).

Boundary line and corner marking and maintenance are recommended (paint the boundary, especially where fences are not present). Secure (locked gate) and post all access points.

Inspect the property regularly for any signs of poor health, insects or disease. If problems are detected, schedule an evaluation by a professional forester and take prompt control action if recommended.

Practice care and vigilance during extreme dry periods. Do not burn if fire danger is high particularly when wind is high and humidity is low. Never leave fires unattended and be sure they are completely extinguished before leaving the site. Consider constructing firelanes around the perimeter of the tract. Maintain existing roads and lanes by periodic mowing and make sure primary access is free of down trees or large limbs. If fire danger is extreme, consider disking roads and lanes.