

# THE VOLUMES AND VALUE OF NON-TIMBER FOREST PRODUCTS HARVESTED IN THE UNITED STATES

---

James L. Chamberlain<sup>1</sup>

---

**Abstract**—Non-timber forest products [NTFPs] originate from plants and fungi that are harvested from natural, manipulated or disturbed forests. NTFPs may include fungi, moss, lichen, herbs, vines, shrubs, or trees. People harvest the products for many reasons, including personal, recreational and spiritual uses, as well as commercial gain. The assessment of volumes and values is based on reports of permitted harvests of NTFPs by the US Forest Service and the Bureau of Land Management. These “sales” are assumed to be for commercial use but stating definitively that they are is speculative at best. The annual harvest of non-timber forest products is estimated for a number of product categories over five regions of the United States. The total value of the receipts from the issuance of permits to harvest non-timber forest products from federal lands is estimated. The wholesale value of these products is extrapolated, as well. The data presented illustrates that non-timber forest products represent significant contribution to the country’s economy. Challenges with reporting the full volumes and value of non-timber forest products are identified and a role for FIA to improve the reporting of this information is discussed.

---

Non-timber forest products (NTFPs) come from plant material and fungi harvested from forests and may include wood-based products that are not of timber size. The products are collected for personal and commercial use, and from public and private lands. Determining how much is harvested for personal use versus commercial gain, is speculative at best. Determining how much is harvested from private lands is next to impossible. The US Forest Service (National Forests) and the Bureau of Land Management issue permits for the harvest of NTFPs, which are ‘assumed to be for commercial use’ though they are likely to include personal consumption, as well (Alexander et al. 2011).

The 2010 National Report on Sustainable Forests (USDA FS 2011) and supporting documentation (Alexander et al. 2011) provides evidence of the volume and value of NTFP harvest in the United States. In developing the supporting documentation, Alexander et al. (2011) crafted an approach to analyze the volume

of NTFPs harvested from US forests and estimate the overall value of these products to the Nation. The analysis presented here follows that approach and provides further evidence of a vibrant industry. This analysis focuses on the entire US that is covered by national forests and Bureau of Land Management.

## METHODS

The primary sources of data for this analysis were the ‘cut and sold’ reports of the US Forest Service (National Forests) and the Timber Sale Information System and Special Forest Products databases of the Bureau of Land Management (BLM). The National Forests report cut and sold data for convertible and non-convertible products (USDA Forest Service 2014). Non-convertible products are those products (i.e., NTFPs) whose units of measure (e.g., gallons, pounds, linear feet) cannot be converted to units consistent with timber products. Data from each agency was collected independently and then combined to report amounts and values for the different categories of NTFPs.

---

<sup>1</sup>Forest Product Technologist, Forest Inventory & Analysis, Southern Research Station, USDA Forest Service, 1710 Research Center Drive, Blacksburg, VA 24060: (540) 231-3611 or jchamberlain@fs.fed.us

USFS and BLM data are ‘permitted’ harvest amounts which may differ from actual harvest quantities. Regular monitoring of actual harvest volumes is lacking in most location on public lands, and there are no records of harvest volumes from private lands. The permitted harvest volumes are the best available data of the amount of NTFPs being removed from federal forest lands.

Value estimations are based on the approach used by Alexander et al. (2011) in reporting for the 2010 National Report on Sustainable Forests (USDA FS 2011). Estimates of the first point-of-sale values are based on assumptions that receipts are 10 percent of first point-of-sales, and that FS sales represent 20-30 percent of total supply, while BLM receipts are 2-15 percent of total supply. The estimated wholesale value of wild-harvested non-timber forest products is based on assumptions that USFS and BLM receipts are 10 percent of first point-of-sale, and that first point-of-sale value is 40 percent of wholesale price. The assumptions also imply that USFS harvest volumes are 20-30 percent of the total, while BLM harvest volumes at 2-15 percent of the total supply.

## RESULTS

Table 1 summarizes the volumes of products permitted harvest from National Forests and BLM lands in 2013. The two agencies report harvest volumes for ten categories of non-timber forest products. Non-convertible products are reported in more than a dozen units of measure. All regions report the permitted harvest of NTFPs, although the products and volumes vary among regions. The West and Rocky Mountain regions have by far the most amount of product harvested, across all categories. The West had the vast majority of products harvested in 12 of the 29 line items. Federal forests in Alaska reported very little permitted harvest, although the state embraces subsistence collection of NTFPs. The Northern region reported the most taps of trees for sap, while the South reported the most permitted harvest of nursery and landscape products.

The US Forest Service and BLM generated close to \$79 million from NTFPs for the ten years covering 2004 through 2013 (Table 2). Overall receipts increased on average about 2 percent per annum. Total annual fluctuations in receipts varied significantly from the mean ( $\mu = \$7.79$  million,  $\sigma = \$630$  thousand) in three years. In the years 2004 through 2007, reporting of grass and forage production may have included beargrass, a plant harvested for the floral and craft industries. Receipts for the harvest of fuelwood accounted for more than half of all NTFP revenues.

The estimated average annual wholesale value of NTFPs harvested in the United States was approximately \$900 million, based on data from the National Forests and Bureau of Land Management (Table 3). In 2013, almost 85 percent of the wholesale value of NTFPs came from crafts and floral products (18%), Christmas trees (12%) and fuelwood (54%). Edible and medicinal forest products comprised approximately 8 percent of total wholesale value.

## DISCUSSION

There are large volumes of plants and fungi harvested from US forests that contribute substantial value to the economy of this country. There are challenges that need to be addressed to fully account for the volumes of materials being harvested. From a demand perspective (i.e., harvest volumes), the lack of standard units of measure makes summarizing data and regional comparisons difficult. For example, products collected for the use in ‘arts and crafts’ are recorded with seven units of measure. Some units of measure could easily be combined; the units of measure for Christmas trees could be consolidated into one unit (e.g., pieces) which would simplify the reporting of this product.

Determining which “product category” to place products is challenging, though not overwhelming. For example, beargrass harvests may have been reported as ‘grass and forage’ although they should have been reported under ‘arts, crafts, and floral’ category. Misplacing product volumes does not impact estimates of total volumes or values, but does misrepresent assessments of specific segments.

**Table 1—Permitted Harvest Volumes of Non-Timber Forest Products from Forest Service and Bureau of Land Management Forests in 2013.**

Product category	Unit of Measure	Alaska	North	Rocky Mt.	South	West	All United States
Arts, crafts, and floral	Bunches	0	0	100	0	0	100
	Bushel	0	180	450	100	71,093	71,823
	Cords	0	0	5	0	93	98
	Feet <sup>3</sup>	0	75	220	348	22	665
	Number	0	0	1,000	0	0	1,000
	Pounds	150	5,630	116,743	201,506	5,321,503	5,645,532
	Ton	0	663	281	65	6,716	7,725
Christmas trees	Each	0	7,277	128,978	249	76,240	212,744
	Linear Feet	0	0	1,566	0	175	1,741
Edible fruits, nuts, berries, and sap	Gallon	0	0	890	0	302,858	303,748
	Pounds <sup>1</sup>	200	400	226,868	30	443,228	670,726
	Taps	0	18,430	0	0	0	18,430
Grass and forage	Pounds	0	104	10	0	4,120,869	4,120,983
	Ton	0	295	3	8	830	1,136
Fuelwood	CCF	244	23,659	349,436	18,397	219,759	611,496
Medicinal	Pounds	0	856	12,148	14,936	14,710	42,650
Non-convertible	Acre	0	0	0	28	0	28
	Bushel	0	0	6	100	0	106
	Feet <sup>3</sup>	0	0	500	750	450	1,700
	Each	0	1,104	50	1,829	2,772	5,755
	Piece	0	2,500	200	640	3,357	6,697
	Pounds	3,000	0	0	4,320	56,776	64,096
	Ton	0	0	43	0	1	44
Nursery and landscape	Each	600	852	9,179	24,942	10,926	46,499
	Ton	0	0	1	0	0	1
Posts and poles	CCF	0	12,367	6,570	97	16,369	35,403
	Linear Feet	0	0	0	0	2,140	2,140
	Number	0	100	22,253	0	6,547	28,900
Regeneration and silviculture	Bushel	0	10	2,183	0	3,513	5,706
	Pounds	0	0	316,744	0	17,037	333,781

\* Units were maintained for all categories except Fuelwood, and Posts and Poles. These categories were converted to ccf (100 cubic feet) when possible.

<sup>1</sup> A large portion of the pounds listed as Grass and Forage is Beargrass (*Xerophyllum tenax*), a plant harvested to make baskets and other crafts, and in fact isn't an actual grass. The USFS categorized it as grass due to its misleading common name.

**Table 2—Receipts for non-timber forest products from U.S. Forest Service and Bureau of Land Management, 2004 through 2013.**

Product category	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<i>Thousand 2013 U.S. Dollars</i>										
Landscaping	257	226	225	220	177	41	84	72	59	61
Crafts and floral	1,091	907	1,759	2,059	817	785	1,166	1,141	1,134	1,518
Regeneration and seed	26	48	37	25	80	96	40	82	52	108
Edible / Culinary	629	327	415	428	733	397	626	489	546	676
Grass and forage	257	330	288	270	217	67	221	185	196	237
Herbs and medicinals	22	17	16	27	53	27	38	44	46	37
Posts and Poles	435	301	331	268	212	203	186	184	252	206
Christmas Trees	1,655	1,727	321	1,344	1,175	376	1,519	1,113	1,090	1,049
Fuelwood	3,449	3,263	3,681	3,879	4,388	4,964	5,030	4,924	4,553	4,579
Other Non-convertible	105	214	272	159	64	23	41	70	7	7
Total <sup>a</sup>	7,926	7,362	7,346	8,679	7,918	6,979	8,951	8,303	7,935	8,477

<sup>a</sup>Totals may be off due to rounding

**Table 3—Estimated wholesale values of permitted NTFP harvests from Forest Service and Bureau of Land Management forests, in 2013 dollars.**

Product category	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
<i>Million 2013 U.S. Dollars</i>										
Landscaping	29.2	25.7	25.6	25.0	20.1	4.7	9.6	8.2	6.7	6.9
Crafts and floral	124.0	103.1	199.9	234.0	92.8	89.2	132.5	129.6	128.9	172.5
Regeneration and seed	3.0	5.4	4.2	2.8	9.1	11.0	4.5	9.3	5.9	12.3
Edible / Culinary	71.4	37.2	47.2	48.7	83.3	45.1	71.1	55.5	62.1	76.8
Grass and forage	29.2	37.5	32.8	30.7	24.7	7.7	25.1	21.0	22.3	26.9
Herbs and medicinals	2.5	1.9	1.9	3.0	6.0	3.0	4.3	5.0	5.2	4.2
Posts and Poles	49.5	34.3	37.6	30.5	24.1	23.1	21.2	20.9	28.6	23.4
Christmas Trees	188.1	196.3	36.5	152.8	133.5	42.7	172.6	126.5	123.9	119.2
Fuelwood	391.9	370.8	418.3	440.7	498.7	564.1	571.6	559.5	517.4	520.3
Other Non-convertible	11.9	24.4	30.9	18.1	7.3	2.7	4.7	8.0	0.8	0.8
Total <sup>a</sup>	900.6	836.6	834.8	986.2	899.7	793.1	1,017.1	943.5	901.7	963.3

<sup>a</sup>Totals may be off due to rounding

The estimated values of NTFPs are based on permitted harvest volumes from Forest Service and BLM lands. In western US this may not present a serious challenge, as these two agencies manage a large proportion of the forest lands. But, in eastern US, private forest lands dominate, and much of the harvest of NTFPs may be coming from non-federal forests. As example, Chamberlain et al (2013) reported the value of American ginseng as \$27 million, while receipts and estimated wholesale value of ‘herbs and medicinals’ are much less, 37 thousand and \$4.2 million, respectively. American ginseng and many other medicinal forest products are harvested primarily from eastern US hardwood forests. The overall value of NTFPs would be much larger if the volumes of private forest lands were determined.

The values would be much greater if other non-timber forest products were included, as well. Fuelwood, which is integral to the definition of non-timber forest products, dominates the value estimates. These values would increase considerably if bioenergy fuels were included. These products originate from wood that is not timber-based, which is consistent with the accepted definition of non-timber forest products.

These and other challenges could be addressed through processes similar to the FIA timber products output assessments. By building partnerships with NTFP industry representatives, FIA could streamline and improve the reporting of harvest volumes from all forests. Through collaborative dialogue such partnerships could advance the valuation estimates of NTFPs and provide better insights into the total valuation of our forests. Such efforts would have serious implications for the management and policies that affect non-timber forest resources and concomitant products.

## LITERATURE CITED

- Alexander, S.J., S.N. Oswalt and M.R. Emery. 2011. Non-Timber Forest Products in the United States: Montreal Process Indicators as Measures of Current Conditions and Sustainability. Gen. Tech. Rep. PNW-GTR-851. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 36 p.
- Chamberlain, J.L.; Prisley, S.; McGuffin, M. 2013b. Understanding the Relationship between American Ginseng Harvest and Hardwood Forests Inventory and Timber Harvest to Improve Co-Management of the Forests of Eastern United States. *Journal of Sustainable Forestry*, 32(6):605-624.
- USDA, Forest Service. 2011. National Report on Sustainable Forests – 2010. FS-979. Washington, D.C.: USDA, Forest Service. 203 p.
- USDA, Forest Service. 2014. Cut and Sold Reports. Available online at <http://www.fs.fed.us/forestmanagement/products/sold-harvest/cut-sold.shtml> [accessed 6 July 2015]