



Indicator 6.26

Value of nonwood forest products produced or collected, 2018

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What is this indicator and why is it important?

Nonwood forest products (NWFPs) are harvested from forests and don't require cutting or removal of trees for timber. These products are a subset of nontimber forest products (NTFPs), which include wood that is not timber-based. People have been collecting these forest products—plant materials for food, fiber, and medicine, and other uses—for personal and commercial gain for generations. As the forest products industry developed, industries based on wood and nonwood forest products developed in parallel. The sale of these products contributes to local, regional, and national economies, though these products are overlooked in the valuation of our forests. Often, the NWFP industry comprises small-scale, locally based entrepreneurs, yet some large international corporations also depend on these products (Chamberlain et al. 2018a). Assigning dollar values to these products helps illustrate their importance to our Nation's economy and the people who depend on them for livelihood.

What does the indicator show?

Data regarding domestic production and prices of NWFPs and NTFPs are not collected regularly. The U.S. Department of Agriculture, Forest Service and U.S. Department of the Interior (DOI), Bureau of Land Management (BLM) collect data on permitted harvests on national forests and BLM

lands, which serve as a point of reference for estimating total value of harvested products. Little monitoring of harvests is undertaken, so permit data from these agencies provide coarse estimates as they may not reflect the actual amounts harvested on Federal lands. Also, permit data do not include the volume or value of NWFPs harvested from private or State lands.

Federal forest land management agencies primarily generate receipts from two categories of products: those that are convertible to units of measure relative to timber and those that are not convertible. Convertible products include timber and other products that can be presented in units of measure that are comparable to timber. The units of measure for nonconvertible products, such as edible fruits, sap, grasses, and other plant material, are not directly comparable to timber products. Nontimber forest products include convertible and nonconvertible products, while NWFPs include only a subset of nonconvertible products. The Forest Service categorizes nonconvertible products as: nursery and landscape; arts, crafts, and floral; regeneration and silviculture; edible fruits, nuts, berries, and sap; grass, hay, alfalfa, and forages; and herbs and medicinals. These categories are consistent with the definition of NWFPs used by the Food and Agriculture Organization of the United Nations. Aside from these NWFPs, NTFPs include other nonconvertible products not specifically classified and all convertible categories (i.e., posts and poles; Christmas trees; and fuelwood).

Estimated value of harvested products may be low because harvest is not limited to Federal lands and harvesting on private lands is not monitored nor included

in value estimates. For example, using State data provided to the DOI U.S. Fish and Wildlife Service, Chamberlain et al. (2013) estimated the annual value at the first point of sale of wild-harvested American ginseng (*Panax quinquefolius*) to range from \$18 million to \$36 million, depending on price (all monetary values are provided in constant 2019 U.S. dollars). The average annual value of wild-harvested American ginseng paid to harvesters during 2000–2007 was approximately \$27 million (Chamberlain et al. 2013, 2018b). In 2007, the estimated first-point-of-sale value of all herbs and medicinal plants harvested, as reported by the Forest Service and BLM, was approximately \$1.3 million (table 26-1). Clearly, the entire value of wild-harvested American ginseng is not included in these estimates.

Over the period 2004–2018, the total value of receipts for permits to harvest NWFPs from Forest Service and BLM lands exceeded \$33.7 million dollars (table 26-2). On average, annual receipts for permits to harvest NWFPs exceeded \$2.2 million of the 15-year period. Permits issued for arts, crafts, and floral products accounted for more than 50 percent of total NWFP value, while forest food (i.e., edible fruits, nuts, berries, and sap) accounted for about 25 percent of the total NWFP value. Notably, medicinal forest products (i.e., herbs and medicinals) accounted for just 1 percent of the total value, despite the value of American ginseng and other medicinal forest products.

This discrepancy is likely due to the predominance of private landownership in regions where medicinal forest products are harvested.

With the inclusion of posts and poles, Christmas trees, fuelwood, and other nonconvertibles considered NTFPs, total receipts exceeded \$126.4 million over the 15-year period. The Forest Service and BLM received an average of more than \$8.4 million annually from permits issued to harvest all NTFPs.

Figure 26-1 illustrates the trends in receipts for the harvest of NWFPs and NTFPs for 2004–2018. Receipts from permits to harvest arts, crafts, and floral products declined over the 15 years and experienced tremendous changes between years. There was a major spike in receipts for these types of products from 2005 to 2007, followed by drastic decline. Receipts increased from 2009 to 2013 and declined through the rest of the period. Receipts for edible products had similar volatility. Relative to other product categories, receipt trends for herbs and medicinals were steady, albeit with some high variants evident between 2012 and 2014.

For the 15-year period ending in 2018, the total estimated overall first-point-of-sale value for NWFPs, based on permits from the Forest Service and BLM, was \$1.53 billion (table 26-1). With the addition of NTFPs, the value more

Table 26-1—Estimated first-point-of sale values for nonwood and nontimber forest products for the United States, 2004–2018, based on harvest records from Forest Service and BLM lands.

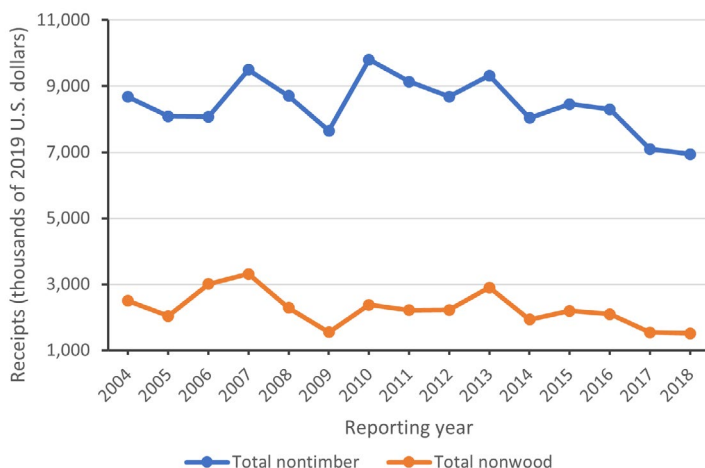
Product category	millions of 2019 U.S. dollars															
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Nursery and landscape	12.78	11.31	11.23	10.93	8.86	2.04	4.19	3.60	2.92	3.05	5.67	24.56	14.39	5.75	8.59	129.87
Arts, crafts, and floral	54.28	45.30	87.90	102.47	40.85	39.10	58.03	57.06	56.41	75.90	42.06	35.22	41.92	33.27	28.12	797.88
Regeneration and silviculture	1.31	2.37	1.84	1.22	3.99	4.80	1.99	4.10	2.60	5.40	7.02	3.97	5.96	5.65	5.31	57.55
Edible fruits, nuts, berries, and sap	31.28	16.33	20.74	21.31	36.67	19.77	31.16	24.44	27.16	33.79	20.59	24.59	22.24	19.57	20.80	370.43
Grass, hay, alfalfa, and forages	12.78	16.48	14.40	13.46	10.87	3.36	10.98	9.26	9.75	11.83	11.52	10.59	9.72	5.24	5.17	155.42
Herbs and medicinals	1.10	0.85	0.82	1.33	2.65	1.34	1.88	2.21	2.28	1.85	0.90	0.93	0.93	0.79	0.86	20.73
Total nonwood	113.52	92.64	136.93	150.72	103.88	70.41	108.24	100.68	101.13	131.82	87.76	99.87	95.16	70.26	68.86	1,531.87
Posts and poles	21.67	15.05	16.55	13.34	10.62	10.12	9.27	9.20	12.52	10.28	11.19	15.08	20.25	11.42	9.54	196.10
Christmas trees	82.35	86.23	16.05	66.89	58.74	18.71	75.59	55.68	54.20	52.45	51.07	56.71	61.89	62.72	71.41	870.68
Fuelwood	171.61	162.90	183.90	193.00	219.37	247.26	250.41	246.37	226.39	228.94	212.45	211.35	199.46	176.11	163.20	3,092.72
Total wood-based nontimber	275.63	264.18	216.50	273.24	288.73	276.09	335.27	311.25	293.11	291.67	274.70	283.13	281.60	250.25	244.15	4,159.50
Other nonconvertibles	5.22	10.70	13.58	7.91	3.22	1.17	2.05	3.51	0.35	0.37	2.92	1.34	0.53	2.25	2.35	57.47
Total nontimber	394.37	367.51	367.00	431.88	395.82	347.67	445.56	415.44	394.58	423.86	365.39	384.34	377.29	322.76	315.36	5,748.83

Sources: U.S. Department of Agriculture, Forest Service National Forest System and U.S. Department of the Interior, Bureau of Land Management (BLM).

Table 26-2—Receipts from issuance of permits to harvest nonwood and nontimber forest products from Forest Service and BLM lands, 2004–2018.

Product category	thousands of 2019 U.S. dollars															
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Nursery and landscape	281.14	248.74	247.13	240.44	194.91	44.95	92.10	79.24	64.28	67.12	124.71	540.32	316.63	126.48	189.00	2,857.20
Arts, crafts, and floral	1,194.13	996.49	1,933.76	2,254.30	898.59	860.23	1,276.74	1,255.43	1,241.01	1,669.70	925.43	774.86	922.21	731.84	618.54	17,553.26
Regeneration and silviculture	28.81	52.20	40.47	26.92	87.72	105.69	43.79	90.12	57.24	118.90	154.53	87.41	131.16	124.20	116.88	1,266.06
Edible fruits, nuts, berries, and sap	688.07	359.20	456.20	468.87	806.68	434.85	685.48	537.75	597.51	743.31	452.93	541.07	489.23	430.53	457.69	8,149.39
Grass, hay, alfalfa, and forages	281.17	362.65	316.76	296.05	239.05	73.95	241.64	203.71	214.51	260.24	253.33	233.09	213.93	115.32	113.80	3,419.20
Herbs and medicinals	24.18	18.75	18.13	29.33	58.36	29.41	41.46	48.67	50.20	40.75	19.79	20.36	20.36	17.30	18.92	455.98
Total nonwood	2,497.50	2,038.04	3,012.45	3,315.91	2,285.32	1,549.09	2,381.22	2,214.92	2,224.75	2,900.02	1,930.72	2,197.11	2,093.53	1,545.67	1,514.83	33,701.08
Posts and poles	476.66	331.10	364.06	293.56	233.55	222.72	203.92	202.41	275.48	226.21	246.09	331.77	445.52	251.26	209.93	4,314.23
Christmas trees	1,811.69	1,897.01	353.15	1,471.65	1,292.24	411.65	1,663.06	1,224.91	1,192.39	1,153.83	1,123.48	1,247.53	1,361.53	1,379.81	1,570.98	19,154.90
Fuelwood	3,775.44	3,583.79	4,045.70	4,246.09	4,826.21	5,439.69	5,508.93	5,420.16	4,980.58	5,036.74	4,673.93	4,649.62	4,388.12	3,874.36	3,590.42	68,039.79
Total wood-based nontimber	6,063.79	5,811.89	4,762.92	6,011.29	6,352.01	6,074.05	7,375.91	6,847.48	6,448.45	6,416.78	6,043.50	6,228.93	6,195.17	5,505.42	5,371.32	91,508.92
Other nonconvertibles	114.81	235.37	298.66	174.12	70.80	25.66	45.18	77.17	7.62	8.18	64.30	29.43	11.65	49.55	51.77	1,264.26
Total nontimber	8,676.10	8,085.31	8,074.03	9,501.32	8,708.12	7,648.80	9,802.30	9,139.57	8,680.82	9,324.99	8,038.52	8,455.46	8,300.35	7,100.65	6,937.92	126,474.27

Figure 26-1—Value of receipts from Forest Service and Bureau of Land Management harvest permits for nontimber and nonwood forest products by year.



than triples to \$5.75 billion. These estimates are based on the assumptions that receipts are 10 percent of first-point-of-sale value and that Forest Service and BLM receipts represent approximately 20–30 percent and 2–15 percent of supply, respectively (Alexander et al. 2011). Products deemed NWFPs accounted for about 27 percent of the total, while fuelwood was about 54 percent of total. Products considered arts, crafts, and florals were about 14 percent of total value.

With the additional assumption that first point of sale is 40 percent of wholesale value, the estimated wholesale value of NWFPs for 2004 through 2018 is \$3.83 billion (table 26-3). The average annual wholesale value for NWFPs during this period is estimated at \$255.31 million. With the inclusion of NTFPs, the total estimated wholesale value over the 15 years was more than \$14 billion. In 2010, the estimated wholesale value was \$1.11 billion; it has declined since to approximately \$788.4 million in 2018. The average annual estimated wholesale value of NWFPs and NTFPs for the 15-year period was approximately \$958.14 million.

What has changed since 2015?

Table 26-4 illustrates changes in estimated wholesales values over three 5-year reporting cycles. Overall, there has been an estimated 29-percent decline in wholesale value of NWFPs from the United States from 2004 through 2018. From the first cycle (2004–2008) to the second (2009–2013), there was about a 14-percent decrease; from the second to the third (2014–2018), there was another 18-percent decrease.

Over the three reporting periods, all product categories except for regeneration and silviculture realized a decline in value. Based on permit receipts, arts, crafts, and floral products realized the largest decline of about 45 percent. Products classified as nursery and landscape saw a 70-percent decrease from the first cycle (2004–2008) to the second (2009–2013), an almost 270-percent increase from the second cycle to the third (2014–2018), and an overall 7-percent increase. Notably, the estimated wholesale value of herbs and medicinals declined about 35 percent over the three reporting periods. Across all reporting cycles, the wholesale value of NTFPs declined about 10 percent.

Table 26-4—Estimated average total and average annual wholesale values of nonwood and nontimber forest products over three 5-year reporting cycles.

Product category	Estimated average totals			Estimated average annual		
	millions of 2019 U.S. dollars					
	2004–2008	2009–2013	2014–2018	2004–2008	2009–2013	2014–2018
Nursery and landscape	137.77	39.51	147.40	27.55	7.90	29.48
Arts, crafts, and floral	826.96	716.26	451.46	165.39	143.25	90.29
Regeneration and silviculture	26.83	47.24	69.79	5.37	9.45	13.96
Edible fruits, nuts, berries, and sap	315.80	340.78	269.48	63.16	68.16	53.90
Grass, hay, alfalfa, and forages	169.96	112.96	105.62	33.99	22.59	21.12
Herbs and medicinals	16.90	23.92	10.99	3.38	4.78	2.20
Total nonwood	1,494.23	1,280.68	1,054.76	298.85	256.14	210.95
Posts and poles	193.06	128.49	168.70	38.61	25.70	33.74
Christmas trees	775.65	641.57	759.47	155.13	128.31	151.89
Fuelwood	2,326.96	2,998.42	2,406.42	465.39	599.68	481.28
Total wood-based nontimber	3,295.67	3,768.49	3,334.58	659.13	753.70	666.92
Other nonconvertibles	101.56	18.61	23.49	20.31	3.72	4.70
Total nontimber	4,891.46	5,067.78	4,412.83	978.29	1,013.56	882.57

Table 26-3—Estimated wholesale values of nonwood and nontimber forest products from the United States, 2004–2018.

Product category	millions of 2019 U.S. dollars															
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Nursery and landscape	31.95	28.27	28.08	27.32	22.15	5.11	10.47	9.00	7.30	7.63	14.17	61.40	35.98	14.37	21.48	324.68
Arts, crafts, and floral	135.70	113.24	219.75	256.17	102.11	97.75	145.08	142.66	141.02	189.74	105.16	88.05	104.80	83.16	70.29	1,994.69
Regeneration and silviculture	3.27	5.93	4.60	3.06	9.97	12.01	4.98	10.24	6.50	13.51	17.56	9.93	14.90	14.11	13.28	143.87
Edible fruits, nuts, berries, and sap	78.19	40.82	51.84	53.28	91.67	49.42	77.90	61.11	67.90	84.47	51.47	61.49	55.59	48.92	52.01	926.07
Grass, hay, alfalfa, and forages	31.95	41.21	36.00	33.64	27.16	8.40	27.46	23.15	24.38	29.57	28.79	26.49	24.31	13.10	12.93	388.55
Herbs and medicinals	2.75	2.13	2.06	3.33	6.63	3.34	4.71	5.53	5.71	4.63	2.25	2.31	2.31	1.97	2.15	51.82
Total nonwood	283.81	231.60	342.32	376.81	259.69	176.03	270.59	251.70	252.81	329.55	219.40	249.67	237.90	175.64	172.14	3,829.67
Posts and poles	54.17	37.63	41.37	33.36	26.54	25.31	23.17	23.00	31.30	25.71	27.96	37.70	50.63	28.55	23.86	490.25
Christmas trees	205.87	215.57	40.13	167.23	146.85	46.78	188.98	139.19	135.50	131.12	127.67	141.76	154.72	156.80	178.52	2,176.69
Fuelwood	429.03	407.25	459.74	482.51	548.43	618.15	626.01	615.93	565.98	572.36	531.13	528.37	498.65	440.27	408.00	7,731.79
Total wood-based nontimber	689.07	660.44	541.24	683.10	721.82	690.23	838.17	778.12	732.78	729.18	686.76	707.83	704.00	625.62	610.38	10,398.74
Other nonconvertibles	13.05	26.75	33.94	19.79	8.05	2.92	5.13	8.77	0.87	0.93	7.31	3.34	1.32	5.63	5.88	143.67
Total nontimber	985.92	918.78	917.50	1,079.70	989.56	869.18	1,113.90	1,038.59	986.46	1,059.66	913.47	960.85	943.22	806.89	788.40	14,372.08

Figure 26-2 illustrates the trends in estimated average annual wholesale values. Average annual NTFP wholesale value increased from the first period (2004–2008) to the second (2009–2013) but subsequently declined in the third. The trend in estimated average annual wholesale value of NWFPs has been a steady decline over the 15-year period.

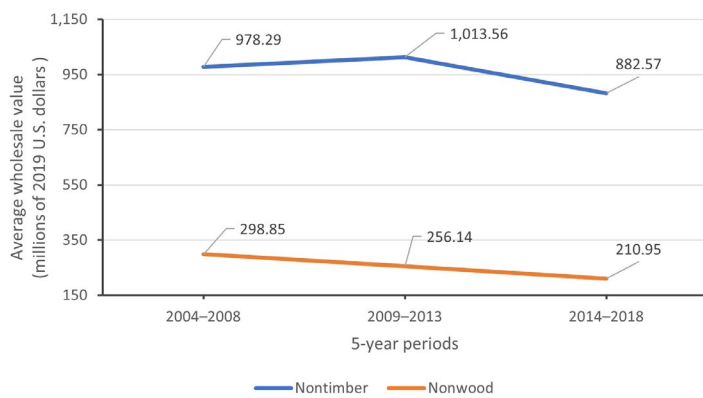


Figure 26-2—Estimated average annual wholesale value of nonwood and nontimber forest products by 5-year reporting cycles.

Are there important regional differences?

Examination of the value of nonconvertible relative to convertible products illustrates regional differences. Over the period 2009 through 2018, and across all Forest Service regions, on average, nonconvertible products accounted for about 4 percent of receipts. In the Southwestern Region (Region 3; Arizona, New Mexico), nonconvertibles averaged about 13 percent of receipts, while nonconvertibles from the Alaska Region (Region 10) averaged about 0.04 percent of receipts. Nonconvertibles accounted for about 6.5 percent of the receipts for national forests in the Pacific Southwest Region (Region 5; California) and about 7 percent of receipts in the Intermountain Region (Region 4). These differences may be due to low timber harvesting relative to harvesting of nonconvertible products. In Arizona and New Mexico, large amounts of firewood and pinyon nuts (from *Pinus* spp.) are harvested and recorded in units that are not convertible.

In addition, the distribution of Federal lands may affect the regional reporting of NWFPs, since data reported are specific to permits on Federal lands and Federal ownership is concentrated in the West. The discrepancy noted above between the estimated value of American ginseng harvests and the much lower value of reported permits

for medicinal plants likely reflects the fact that American ginseng is harvested in the East where public forest land ownership is significantly less.

Why can't the entire indicator be reported at this time?

The main reason that the indicator cannot be fully reported is that reporting of harvest data comes primarily from Federal agencies, but harvesting is not limited to Federal lands. There is no way to estimate the amount of NWFPs harvested from private lands nor personal-use harvest levels. The institutional framework does not exist to collect data on the full spectrum of NWFPs harvested from all lands (Chamberlain et al. 2018b). Further, the assumption by which these estimates are made must be scrutinized and modified accordingly.

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U.S. Forest Sustainability Indicators:
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