

# **Economic Contributions of Sunday Hunting Alternatives in Pennsylvania: *2010 Update***

***For:***

**Pennsylvania Legislative Budget and  
Finance Committee, Pennsylvania General  
Assembly**

***By:***

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This report estimates the economic contributions of hunting in Pennsylvania in 2010, and the potential increase that might have occurred with expanded Sunday hunting. These results update an earlier estimate of the potential impacts of Sunday hunting in 2005 with the latest available data on the numbers of hunters in Pennsylvania and their estimated expenditures.<sup>1</sup> Three separate tables of estimates are presented that include all hunter expenditures, all expenditures minus trip-related costs, and all expenditures minus trip-related costs and selected hunting equipment.

Hunter expenditures and impacts are based on the Pennsylvania Game Commission's report of 948,381 general hunting licenses sold for FY 2009-10. This figure is used as the number of hunters in Pennsylvania. Using expenditure information provided in the *2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation* and updated to reflect 2010 prices, those hunters spent \$1.7 billion on goods and services directly related to their hunting activity. Greater details are presented in the methodology section at the end of this report.

Part A of Table 1 shows total estimated retail sales due to hunting in 2010 of \$1.7 billion and the resulting multiplier effects in terms of total output (sales by retailers and other businesses impacted by hunter purchases), salaries and wages, jobs, and tax revenues to local, state and federal governments. These are reported separately for hunting in general (including deer hunting and hunting for other species) and deer hunting only.

The \$1.7 billion of retail spending by hunters, overall, is estimated to have generated \$3.0 billion of output in the Pennsylvania economy. This level of economic activity supported 27,552 jobs (both full and part time) and \$916.4 million of wages and salaries. Including the multiplier effects, the spending by hunters generated an estimated \$210.4 million of tax revenue to state and local governments in Pennsylvania, and \$224.7 million of federal tax revenues.

Deer hunters spent an estimated \$964.0 million in 2010, resulting in \$1.7 billion of output in the Pennsylvania economy. This level of economic activity supported 18,036 jobs and \$598.1 million of wages and salaries. Including the multiplier effects, the spending by hunters generated an estimated \$126.7 million of tax revenue to state and local governments in Pennsylvania, and \$140.5 million of federal tax revenues.

Part B of Table 1 reports the estimated total retail sales and multiplier effects that would have occurred in 2010 if Sunday hunting were permitted. The 2005 survey of Pennsylvania hunters found that overall hunting activity would increase by approximately 27.0% if Sunday hunting were allowed. It is assumed this would result in similar increases in hunter expenditures and associated multiplier effects. Part B also

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<sup>1</sup> See *A Study of the Potential Economic, Social, and Other Impacts of Expanding Sunday Hunting in Pennsylvania*, Legislative Budget and Finance Committee, June 2005.

shows the impact of allowing Sunday hunting for only the two Sundays during the general deer season (an 18.3% increase in economic impact, compared to a 27% increase if Sunday hunting was allowed in all seasons).

Part C of Table 1 presents the net increase in hunting activity, spending and economic multiplier effects in 2010 if Sunday hunting were permitted. Spending by all hunters would likely have increased by \$460.0 million. The multiplier effects of that spending would have produced \$803.6 million of total output in the Pennsylvania economy and supported 7,439 jobs with \$247.4 million of salary and wage income. The increased activity would have generated \$56.8 million in tax revenue to state and local governments and \$60.7 million in federal tax revenues.

Spending by deer hunters, if Sunday hunting was allowed on only the two Sundays of the general rifle season, would likely have increased by \$176.4 million. The multiplier effects of that spending would have produced an estimated \$317.1 million of total output in the Pennsylvania economy and supported 3,301 jobs with \$109.5 million of salary and wage income. The increased activity would have generated \$23.2 million in tax revenue to state and local governments and \$25.7 million in federal tax revenues.

Compared to the estimated numbers of hunters, hunting activity and economic contributions in 2003, the changes in 2010 are mixed. In particular, the level of hunting activity increased approximately seven percent from 2003 to 2010. The increased hunting activity may be the result of greater average days of hunting per hunter in 2010 (16.1 days per hunter) compared to 2003 (13.9 days per hunter).<sup>2</sup> Increases can occur as a result of expanded seasons such as increasing the number of days available for species such as turkey, waterfowl and deer, and by better weather in the year of the later survey. Per the U.S. Fish and Wildlife Service, total retail sales due to hunting increased in nominal terms over 38%, from \$1.2 billion in 2003 to \$1.7 billion in 2010. On an inflation-adjusted basis, retail sales increased approximately 17% since 2003. Similar increases are reported for the multiplier effects.

Table 2 presents the same information as Table 1 with the exception that all spending estimates and impacts exclude any trip-related costs such as food, fuel, lodging, restaurants, and similar expenses. While we believe this underestimates the total economic impact of hunting, concern was expressed that including travel expenses may result in a high estimate for the marginal impact of allowing Sunday hunting (e.g., hunters who simply stay an extra night at hunting camp to hunt on a Sunday may incur few additional travel costs). Part B of Table 2 therefore shows the estimated retail sales and multiplier effect that would have occurred in 2010 if Sunday hunting were

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<sup>2</sup> The 2003 data are based on the U.S. Fish and Wildlife Service's 2001 National Survey of Fishing, Hunting and Wildlife-Associated Recreation. The 2010 numbers are based on the later 2006 Survey of Fishing, Hunting and Wildlife-Associated Recreation. Details are provided in the Methodology section. A newer data set reporting 2011 activity levels will be released in mid-to-late 2012.

permitted excluding trip-related costs. Part C reports the net increase in hunting activity, spending and economic multiplier effects in 2010 if Sunday hunting had been permitted both for all hunting seasons and for just the two Sundays of the general rifle season for deer. Ignoring trip-related costs, Sunday hunting in 2010 would have increased total economic output by an estimated \$676.6 million from all hunting and \$262.0 million for the two Sundays of the general rifle season.

Table 3 presents the same information as Table 1 with the exception that all spending estimates and impacts exclude any trip-related costs and hunting-specific equipment. This analysis was done to address concerns that simply allowing Sunday hunting also might not result in significant new purchases of firearms or other hunting-specific equipment. Auxiliary equipment and items that serve other purposes such as coolers, vehicles and similar products are, however, retained in the analysis.

Part B of Table 3 shows the retail sales and multiplier effects that would have occurred in 2010 if Sunday hunting were permitted without trip-related and hunting equipment costs. Part C reports the net increase in hunting activity, spending and economic multiplier effects in 2010 if Sunday hunting had been permitted. Ignoring trip-related costs and hunting equipment purchases, Sunday hunting in 2010 would have increased total economic output by an estimated \$495.9 million from all hunting and \$211.4 million for deer hunting alone during the two Sundays of the general rifle season.

**Table 1. Estimated economic contributions of hunting under current regulations and with expanded Sunday hunting in Pennsylvania, 2010.**

					Multiplier Effects				
					Total Output	Salaries and Wages	Jobs	State and Local Taxes	Federal Taxes
		Hunters	Hunter-Days	Retail Sales					
<b>A. Current Impacts (without Sunday hunting):</b>									
All Hunting:	Total:	948,381	15,314,783	\$1,703,842,337	\$2,976,327,224	\$916,402,330	27,552	\$210,384,751	\$224,715,750
	Per Day			\$111.25	\$194.34	\$59.84		\$13.74	\$14.67
Deer Hunting: <sup>a</sup>	Total:	888,187	10,039,865	\$963,996,285	\$1,732,584,049	\$598,136,571	18,036	\$126,674,271	\$140,488,285
	Per Day			\$96.02	\$172.57	\$59.58		\$12.62	\$13.99
<b>B. If Sunday Was Permitted:</b>									
All Hunting:	Total:		19,449,774	\$2,163,879,768	\$3,779,935,574	\$1,163,830,959	34,991	\$267,188,634	\$285,389,002
	Per Day			\$141.29	\$246.82	\$75.99		\$17.45	\$18.63
Deer Hunting: <sup>b</sup>	Total:		11,877,160	\$1,140,407,605	\$2,049,646,930	\$707,595,563	21,337	\$149,855,662	\$166,197,641
	Per Day			\$113.59	\$2.13	\$0.41		\$8,308.65	\$1.31
<b>C. Net Increase from Sunday Hunting:</b>									
All Hunting:	Total:		4,134,991	\$460,037,431	\$803,608,350	\$247,428,629	7,439	\$56,803,883	\$60,673,252
	% increase				27.0%	27.0%	27.0%		27.0%
Deer Hunting: <sup>b</sup>	Total:		1,837,295	\$176,411,320	\$317,062,881	\$109,458,992	3,301	\$23,181,392	\$25,709,356
	% increase				18.3%	18.3%	18.3%		18.3%

a Represents current economic impacts from all deer hunting in all seasons (firearm, muzzleloading, bow-hunting).

b Represents estimated economic impacts from the addition of two days of Sunday hunting during the general deer season.

**Table 2. Estimated economic contributions of hunting under current regulations and with expanded Sunday hunting in Pennsylvania, 2010, excluding trip-related expenditures.**

					Multiplier Effects				
					Total Output	Salaries and Wages	Jobs	State and Local Taxes	Federal Taxes
		Hunters	Hunter-Days	Retail Sales					
<b>A. Current Impacts (without Sunday hunting):</b>									
All Hunting:	Total:	948,381	15,314,783	\$1,434,465,600	\$2,505,771,175	\$771,519,517	23,196	\$177,123,013	\$189,188,287
	Per Day			\$93.67	\$163.62	\$50.38		\$11.57	\$12.35
Deer Hunting: <sup>a</sup>	Total:	888,187	10,039,865	\$796,482,973	\$1,431,513,499	\$494,198,579	14,902	\$104,662,125	\$116,075,683
	Per Day			\$79.33	\$142.58	\$49.22		\$10.42	\$11.56
<b>B. If Sunday Was Permitted:</b>									
All Hunting:	Total:		19,449,774	\$1,821,771,312	\$3,182,329,393	\$979,829,787	29,459	\$224,946,226	\$240,269,124
	Per Day			\$118.96	\$207.79	\$63.98		\$14.69	\$15.69
Deer Hunting: <sup>b</sup>	Total:		11,877,160	\$942,239,357	\$1,693,480,469	\$584,636,919	17,629	\$123,815,294	\$137,317,533
	Per Day			\$93.85	\$2.13	\$0.41		\$8,308.65	\$1.31
<b>C. Net Increase from Sunday Hunting:</b>									
All Hunting:	Total:		4,134,991	\$387,305,712	\$676,558,217	\$208,310,270	6,263	\$47,823,213	\$51,080,837
	% increase				27.0%	27.0%	27.0%		27.0%
Deer Hunting: <sup>b</sup>	Total:		1,837,295	\$145,756,384	\$261,966,970	\$90,438,340	2,727	\$19,153,169	\$21,241,850
	% increase				18.3%	18.3%	18.3%		18.3%

a Represents current economic impacts from all deer hunting in all seasons (firearm, muzzleloading, bow-hunting).

b Represents estimated economic impacts from the addition of two days of Sunday hunting during the general deer season.

**Table 3. Estimated economic contributions of hunting under current regulations and with expanded Sunday hunting in Pennsylvania, 2010, excluding trip-related expenditures and purchases of selected hunting equipment.**

					Multiplier Effects				
					Total Output	Salaries and Wages	Jobs	State and Local Taxes	Federal Taxes
		Hunters	Hunter-Days	Retail Sales					
<b>A. Current Impacts (without Sunday hunting):</b>									
All Hunting:	Total:	948,381	15,314,783	\$1,051,461,725	\$1,836,727,548	\$565,522,968	17,003	\$129,830,976	\$138,674,809
	Per Day			\$68.66	\$119.93	\$36.93		\$8.48	\$9.05
Deer Hunting: <sup>a</sup>	Total:	888,187	10,039,865	\$642,848,907	\$1,155,388,024	\$398,872,327	12,028	\$84,473,787	\$93,685,777
	Per Day			\$64.03	\$115.08	\$39.73		\$8.41	\$9.33
<b>B. If Sunday Was Permitted:</b>									
All Hunting:	Total:		19,449,774	\$1,335,356,391	\$2,332,643,986	\$718,214,169	21,594	\$164,885,339	\$176,117,007
	Per Day			\$87.19	\$152.31	\$46.90		\$10.77	\$11.50
Deer Hunting: <sup>b</sup>	Total:		11,877,160	\$760,490,257	\$1,366,824,032	\$471,865,962	14,229	\$99,932,490	\$110,830,274
	Per Day			\$75.75	\$2.13	\$0.41		\$8,308.65	\$1.31
<b>C. Net Increase from Sunday Hunting:</b>									
All Hunting:	Total:		4,134,991	\$283,894,666	\$495,916,438	\$152,691,201	4,591	\$35,054,363	\$37,442,198
	% increase				27.0%	27.0%	27.0%		27.0%
Deer Hunting: <sup>b</sup>	Total:		1,837,295	\$117,641,350	\$211,436,008	\$72,993,636	2,201	\$15,458,703	\$17,144,497
	% increase				18.3%	18.3%	18.3%		18.3%

a Represents current economic impacts from all deer hunting in all seasons (firearm, muzzleloading, bow-hunting).

b Represents estimated economic impacts from the addition of two days of Sunday hunting during the general deer season.

## Methodology:

The economic contributions of Sunday hunting in Pennsylvania were previously estimated by Southwick Associates in 2005<sup>3</sup>. The earlier estimates relied on the *2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation* and a survey of Pennsylvania hunters, landowners and operators of regulated commercial hunting grounds conducted in 2005. The current report updates the earlier work using the Pennsylvania Game Commission's estimate of licensed Pennsylvania hunters in FY 2009-10, plus the *2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation*, and the 2005 survey of Pennsylvania hunters.

The *2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation* provides the most current, reliable source of hunting activity and hunter expenditures in Pennsylvania. This source was used to estimate the percentage of all hunting activity that targets deer, which is a key number used in the estimates and tables presented earlier.

Based on data from the *2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation*, Pennsylvania hunters overall spent an average of \$111.25 per day of hunting in 2006 and deer hunters spent average of \$96.02 per day of hunting. Spending estimates include all expenditures for hunting-related goods and services in 2006. Assuming the same per-hunter level of spending occurred in 2010, and adjusting for inflation between 2006 and 2010 (8.16%), we estimate that hunters overall spent \$1.7 billion in 2010 and deer hunters spent \$964.0 million.

The estimated multiplier effects of hunter expenditures in Pennsylvania are based on the results of a previous analysis that was conducted by Southwick Associates for the Association of Fish and Wildlife Agencies<sup>4</sup>. That analysis relied on the detailed spending data in the *2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation* and used the IMPLAN input-output model of the Pennsylvania economy to estimate the multiplier effects. Because input-output models are linear in their estimates of multiplier effects, we applied the estimated percent increase in retail spending between 2006 and 2010 to the multiplier effects in the 2006 study to arrive at the estimated multiplier effects in 2010. Assuming that the Pennsylvania economy has not experienced substantial structural changes since 2006, we estimate that retail purchases by hunters overall in 2010 generated \$3.0 billion of total output in the Pennsylvania economy including indirect and induced multiplier effects (output multiplier of 1.7). Spending by deer hunters generated \$1.7 billion (output multiplier of 1.8). The multiplier for deer hunters is slightly different due to differences in the mix of goods and services purchased by deer hunter compared to hunters, overall.

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<sup>3</sup> [A Study of the Potential Economic, Social, and Other Impacts of Expanding Sunday Hunting in Pennsylvania](#), conducted pursuant to HR 927 of 2004, Legislative Budget and Finance Committee, 2004..

<sup>4</sup> [Hunting in America: An economic engine and conservation powerhouse](#), Association of Fish and Wildlife Agencies, Washington, DC, 2007.



In addition to the overall analysis of all hunting expenditures to determine the level of output, retail, and multiplier effects, the data was analyzed to represent three different sets of expenditures. The first, shown in Table 1, examines of all expenditures. Table 2 presents all expenditures minus trip-related costs. Table 3 table excludes both trip-related costs and purchases of hunting equipment. The specific types of expenditures include in each scenario are presented in Figure 1.

**Figure 1. Specific expenditure categories included in each impact scenario.**

	Table 1	Table 2	Table 3
<b>Trip-related Costs</b>	[Blue box]		
Food			
Lodging			
Airplane fare			
Public transport			
Automobile			
Guide fees			
Public land fees			
Private land fees			
Heat/cook fuel			
Equip rentals			
Boat fuel			
Boat launch fee			
Boat mooring			
<b>Hunting equipment costs</b>	[Blue box]	[Blue box]	
Rifles			
Shotguns			
Muzzle loader			
Handgun			
Bows			
Scopes - guns			
Decoys			
Ammo			
Handloading			
Dogs			
Other hunt equip			
<b>Auxiliary equipment costs</b>	[Blue box]	[Blue box]	[Blue box]
Camping gear			
Binoculars			
Foul weather gear			
Taxidermy			
Other items			
<b>Special equipment</b>	[Blue box]	[Blue box]	[Blue box]
Bass boat			
Boat			
Canoe			
Boat motor			
Van			
Cabin			
Off-road vehicle			
Other special equip			
<b>Other items</b>	[Blue box]	[Blue box]	[Blue box]
Books			
Dues			
License			
Land purchase			
Land lease			

