

Trophy hunters of native carnivores benefit from wildlife conservation funded by others

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January 2020

A report by Dr Cameron K. Murray for the Humane Society of the United States



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Citation:

Murray, C. K. (2019). *Trophy hunters of Native Carnivores benefit from wildlife conservation funded by others*. A report for the Humane Society of the United States. Brisbane, Australia. ^[1]_[SEP]

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Executive Summary

The conservation story often heard in the United States is that trophy hunters are leaders of wildlife conservation as they are a major funding source.¹ But is this story true? This report takes a deep dive into conservation funding to answer this question.

Public data is assembled to assess how much trophy hunting actually contributes to overall wildlife conservation funding. Due to information limitations, this is achieved by establishing the total funding from all hunting, and scaling down based on hunter surveys that show that around 2% of hunters are involved in trophy hunting of native carnivores.

After closely examining the funding mechanisms and expenditures of conservation agencies and organizations across the United States, we find that 94% of wildlife conservation funding is unrelated to hunting of any type, and that trophy hunting of native carnivores is likely to contribute just 0.13% of funding, which is \$1 out of every \$770 of funding.

Hunting-lobby groups and state-wildlife agencies typically overstate the economic benefits of hunting, adding up gross spending on all hunting-related activity rather than assessing the net benefits on a 'with' and 'without' hunting basis. In keeping with this net approach, we find that the high cost of regulating hunting means that it is unlikely that there is a net funding contribution from trophy hunters to wildlife conservation.

The relative importance of wildlife watching-related activity in wildlife conservation is growing, however. Total wildlife-watching expenditures were \$76 billion in 2016, three times higher than all hunting-related expenditures, and have grown twice as fast since 1991. Participation in wildlife watching is now seven times higher than hunting participation.

In short, trophy hunters appear to be primarily the beneficiaries of wildlife conservation funded by others.

Minimal conservation funding from hunting

Wildlife conservation in the United States is undertaken by various federal and state agencies in addition to an active not-for-profit sector. Both public and private organizations conduct land conservation activities, as well as research and monitoring programs, and advocate for wildlife conservation. The following summarizes the funding sources for conservation entities in each sector, identifying the net funding contribution from hunting based on a ‘with and without’ approach.²

To isolate the contribution of only trophy hunting of native carnivores (such as bears, wolves, and mountain lions) compared to total hunting, survey data from the 2016 National Survey of Fishing, Hunting and Wildlife-Associated Recreation (FHWAR) of wildlife is used. The FHWAR is the most comprehensive recent large-scale survey of hunting, with 3,931 hunter and angler respondents out of a total survey pool of 22,725.³ Even with this large sample, the data on trophy hunting of native carnivore species is limited due to the relatively small overall participation in this type of hunting. Considering the combined components of the FHWAR for bears and ‘other big game’ as reflective of the maximum share of trophy hunting, this would mean that trophy hunters are at most 3% of all hunters and account for at most 1.5% of all hunting days. In the absence of a better way to account for this small component of hunting in the United States, a 2% share of total funding has been assumed in this section to provide an indicative estimate of conservation funding from native carnivore trophy hunters.

Federal funding

Most United States conservation funding comes from federal sources for the management of vast public land holdings in the western United States and Alaska. Over \$12 billion was appropriated in FY2018 for the main agencies, which together manage over 610 million acres of land, with funding and land managed by each agency shown in Table 1.⁴ The Bureau of Land Management (BLM) and United States Forest Service (USFS) are the primary land management agencies and are responsible for vast areas of land that provide wildlife habitat. The National Park Service (NPS) also manages 80 million acres of land providing wildlife habitat.

In terms of land area for wildlife habitat, 46% of the land in the eleven western states is owned federally, as is 61% of Alaska. In addition to the lands described in Table 1, the United States Fish and Wildlife Service (USFWS) manages 471.1 million acres of marine refuges and national monuments. Together, these federal agencies are the primary source of land management and conservation activity in the United States.

In Table 1 the amount of funding for each agency that comes from all hunting activity is broken out in the last column. As these agencies perform many functions besides the management of land for wildlife, the bottom of Table 1 contains a scenario analysis that shows the adjusted hunting share of conservation funding for these federal agencies based on three alternative assumptions about the conservation activities of each on average: either 75%, 50% or 25% of agencies’ activities involved in conservation. Even in the most generous scenario where only 25% of the activities of these agencies is deemed to be conservation-related, trophy hunting is still just a fraction of a percent—0.16%—of federal conservation funding.

TABLE 1: FEDERAL AGENCIES INVOLVED IN CONSERVATION — TOTAL AND HUNTER FUNDING

Agency (FY 2018 unless otherwise noted)	Land area managed (million acres)	Total funding (\$ million)	Funded by hunting (\$ million)
U.S. Fish and Wildlife Service (total) ⁵	89	2,776	238
Pittman-Robertson Act funds		830	195
Dingell-Johnson Act funds		455	5

Migratory Bird Conservation Account ⁶		73	38
National Wildlife Refuge System		470	0
Other U.S. Fish and Wildlife Service		948	0
U.S. BLM⁷	248	1,087	0
U.S. Forest Service⁸	193	5,199	0
National Park Service⁹	80	3,261	0
TOTAL	610	12,323	238
Share of total from all hunting			1.9%
Share of total from trophy hunting			0.04%
SCENARIOS (share of agency conservation activity)	Adjusted hunting funding contribution		
75% (\$9,242 million)		Hunting total	2.6%
		Trophy hunting	0.05%
50% (\$6,162 million)		Hunting total	3.9%
		Trophy hunting	0.08%
25% (\$3,081 million)		Hunting total	7.7%
		Trophy hunting	0.15%

The hunting funding contribution for the U.S. Fish and Wildlife Service (USFWS) shown in Table 1 was derived for each component as follows.

Funding via the **Pittman-Robertson Act**¹⁰ comes from excise taxes on weapons and ammunition. The Congressional Research Service¹¹ has shown that revenues are from a combination of ammunition, archery equipment, firearms (shotguns and rifles) and handguns (see time series revenue components in Figure 1). How much of this revenue can be attributed to hunting?

It is impossible to know the answer to this question with certainty, but a close approximation can be made by making reasonable assumptions about the share of each type of firearm that could be used for hunting. Previous analysis of the types of long guns sold¹² using data from 2012 and earlier indicated that around 40% can be reasonably denoted as hunting weapons. In that analysis, 5% of handguns were denoted to be hunting related, as well as 30% of archery equipment¹³ and 20% of ammunition.

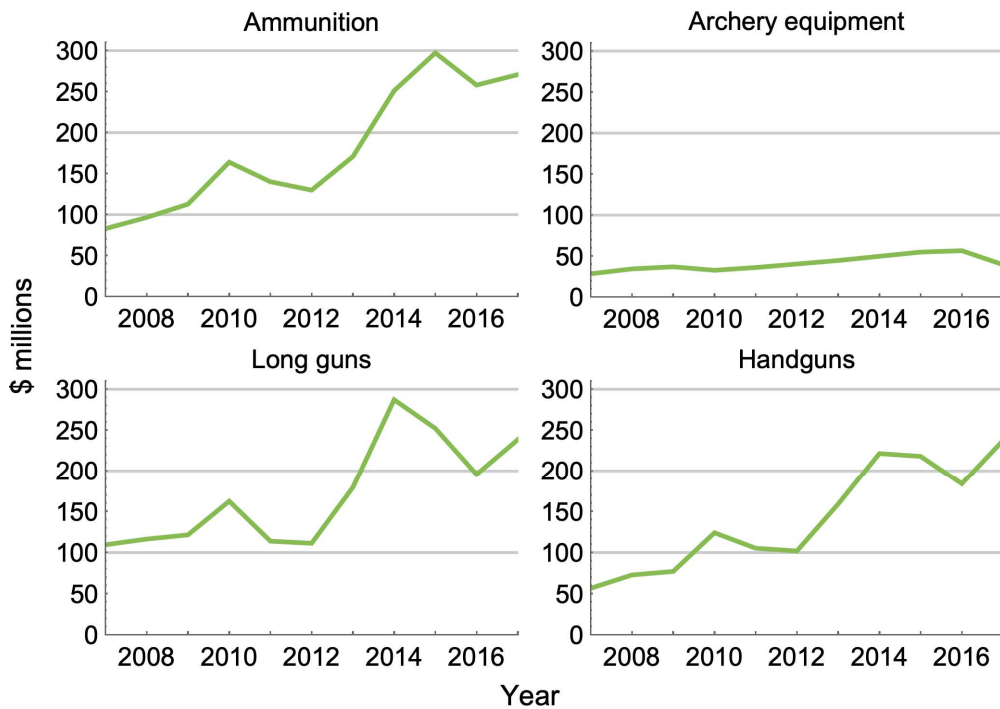


FIGURE 1: EXCISE REVENUE SOURCES RELATED TO THE PITTMAN-ROBERTSON ACT

However, as Figure 1 shows, between 2012 and 2017, Americans rapidly increased their purchases of firearm and ammunition sales of all types, approximately doubling within two years. Over the same period surveys show that participation in hunting has been in decline.¹⁴ The firearms sales boom has seen a “disproportionate increase in sales of pistols, tactical long guns, and the related ammunition,” which has “decreased the apparent hunting contribution.”¹⁵ Many surveys provide additional evidence of a large decline in gun purchases for hunting.¹⁶ As such, we use the downward adjustment of “10 percentage points” to the above 40% estimate (now 30%) that was suggested for long guns to account for the 2013 sales surge which has been sustained since that time. Applying this share of revenue to hunting to the 2017 data gives a total of \$168 million as total funding contribution from hunting, or 13.5% of the total (calculation shown in Table 2).

Dingell-Johnson Act¹⁷ funds come from a variety of sources mostly related to boating and fishing, such as import duties on boats and fishing tackle, taxes on electric motors, motorboat fuel and fishing equipment.¹⁸ Little of this revenue is related to hunting, as opposed to fishing. Available data from FY2016 on the share of revenues from each tax has been applied to the FY2018 funding totals to determine the breakdown of funding in Table 2.¹⁹ Approximately 51% of revenue was from motorboat fuel taxes, while the small engine fuel tax generated 15% of Dingell-Johnson Act funds.

It is likely that just a small fraction of these specific taxes can be attributed to hunting rather than fishing or recreational boating. While a fishing component of this revenue would be the majority, the focus of this report is on hunting, and trophy hunting of native carnivores as a particular subset of all hunting. Based on a recent survey of recreational boat use, an attribution to hunting of 6% of the small engine fuel tax is applied here to account for the likely reduction in fuel taxes in a ‘without hunting’ scenario.²⁰

TABLE 2: HUNTER ATTRIBUTION OF FUNDING TO SPECIFIC FUNDS

Source of revenue (FY 2018 unless otherwise noted)	Total funding (\$ million)	Funded by hunting (\$ million)
Pittman-Robertson Act fund	830	168
Ammunition	276	55

Firearms (long guns)	271	81
Archery equipment	69	21
Handguns	214	11
Dingell-Johnson Act funds	455	5
Motorboat fuel tax	250	0
Small engine fuel tax	67	4
Excise tax on fishing equipment	62	0
Interest income	52	1 ²¹
Import duties on tackle and craft	23	0
TOTAL FUNDING	1,285	173
Share of total from all hunting		13.5%
Share of total from trophy hunting		0.3%

The total revenue directly attributable to all types of hunting from the Pittman-Robertson Act funds and Dingell-Johnson Act funds together was \$173 million in FY 2018, or just 13.5% of the total funding from these sources. Applying the 2% trophy hunting share, this gives an estimate of \$3.5 million, or 0.3% of the total funding attributable from trophy hunters from these sources.

For the **Migratory Bird Conservation Account**, the two main revenue sources in FY 2018 are Duck Stamps (\$37 million) and customs duties on arms and ammunition (\$32 million), with \$4 million from other sources.²² According to USFWS, 86.6% of Duck Stamps are sold to hunters, and as such that proportion, or \$32 million, is attributed to hunting in this exercise.²³ Customs duties are not fully attributed to hunting as these apply to all firearms — those which are suitable for hunting and those which are not. Based on the firearms' import data for 2017,²⁴ only 28% of imported firearms were shotguns or rifles, the remainder being handguns. Not all shotguns and rifles sales were to hunters, and indeed, given the observed rise in firearms sales in (Figure 1)—the 2012-17 sales are double the 2007-12 sales—at a time when hunting participation is flat or falling, most recent sales are unlikely to be related to hunting. In the absence of other benchmarks, the 20% net apportionment to hunting calculated earlier for the Pittman-Robertson Act analysis is used, which suggests that of the \$32 million in customs duties, \$6.4 million is likely to be hunting related. In total that is \$38 million out of the \$73 million to the Migratory Bird Conservation Account that is estimated to be hunting-related.

Funding for other federal agencies comes from general revenues and other charges to land users, and as such no particular assignment for hunter funding has been made, even though it is likely that people who hunt do contribute to funding these agencies. To make a consistent *'with and without trophy hunting'* case, the general taxes paid by hunters that do fund these agencies is excluded, since these taxes are paid regardless of whether any hunting happens.

State funding

Recent analysis suggests that around 28% of state wildlife agency funding comes from federal sources related to the Pittman-Robertson Act, Dingell-Johnson Act, and distribution of grants from USFWS including in relation to the National Wildlife Refuge System.²⁵ This leaves \$4,054 million from state level funding. State level general funding is around 16% of the total, leaving 44% of total revenue from state agency fees, charges, and licenses.

If we take state hunting license sales revenue as the financial contribution of hunting (leaving aside fishing licensing and other visitor fees), then, as shown in Table 3, all hunters have contributed \$821 million out of more than \$4 billion in non-federal wildlife conservation funding. **Hunting therefore contributes around 20% of non-federal funds for state wildlife agencies, with trophy hunting just 0.4%.** Compared to other parts of the wildlife conservation effort, this is where hunters make the largest financial contribution.

TABLE 3: STATE WILDLIFE AGENCY FUNDING FROM HUNTING

Agency (FY 2015 unless otherwise noted)	Non-federal funding (\$ million)	Total funded by hunting
State wildlife and parks agencies	4,054	821 ²⁶
Share of total from all hunting		20.0%
Share of total from trophy hunting		0.4%

Each state varies around this national average. Take, for example, Montana, where non-federal funding needed to run the Department of Fish, Wildlife and Parks (FWP) amounts to \$68 million per year (in FY2017),²⁷ with total hunting license sales of \$30 million, or 44% of FWP’s income. Another state with high hunter funding is Wyoming, with \$25 million in hunting license revenue in FY2017, which is 42% of \$60 million per year in state funding for the Wyoming Game and Fish Department.²⁸ At the other end of the spectrum is Florida’s Fish and Wildlife Conservation Commission, which has estimated state funding of \$290 million,²⁹ of which \$9 million comes from hunting licenses, or 3%.

Over time, the number of hunting licenses issued across all states has grown slightly, and the revenue to state wildlife agencies from these licenses grew from \$483 million in 1991 to \$821 million in 2017. In real terms, however (adjusting for inflation), total license revenue has been flat, which is clearly seen in the left panel of Figure 2. By comparison, Pittman-Robertson Act funding has grown 240% in real terms since 2007.

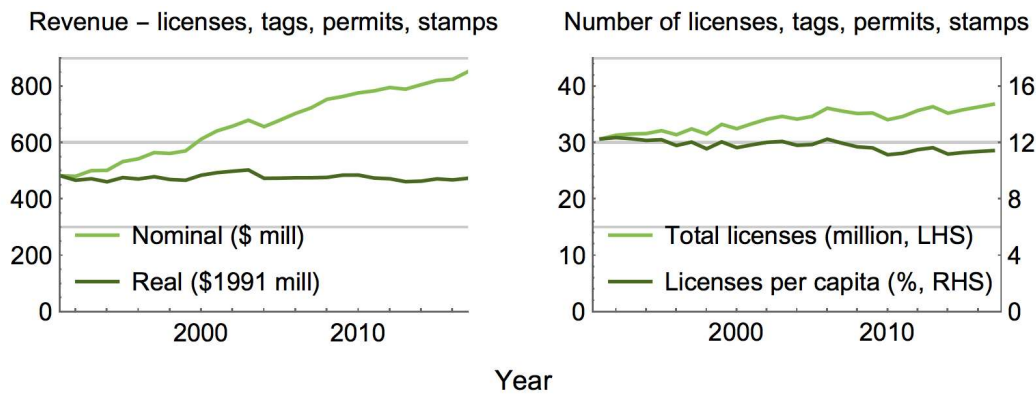


FIGURE 2: REVENUE AND NUMBER OF TOTAL STATE HUNTING LICENSES

Not-for-profit funding

The final portion of conservation funding in the United States comes from private philanthropy via not-for-profit organizations, which typically fund conservation activities such as land purchases, land management, conservation education, and advocacy. Sometimes these organizations also receive government grants that are accounted for in the previous analysis.

The list of potential candidate groups is long; therefore, to make the task manageable, a sample of organizations has been chosen based on their total funding, their recognition in the *Forbes* top 200 environmental charities list,³⁰ and from previous research.³¹

The twelve organizations sampled are listed in Table 4, with an attribution of funding arising from hunting activity. One difficulty here is to establish the contribution of funding from hunters that would not occur in a ‘without hunting’ scenario. After all, many hunters will donate to conservation organizations even if they no longer hunt.

The majority of conservation organizations are primarily not hunting related, with the clear exception of Ducks Unlimited and the Rocky Mountain Elk Foundation. Even here, Ducks Unlimited is largely funded through federal government grants — money that is accounted for elsewhere in this analysis and cannot again be attributed as due from hunting activity.

TABLE 4: NOT-FOR-PROFIT CONSERVATION FUNDING

Organization (FY 2017 unless otherwise noted)	Total funding (\$ million)	Total funded by hunting
Nature Conservancy ³²	1,144	0
Land Trusts ³³	1,022	47 ³⁴
Wildlife Conservation Society ³⁵	321	0
World Wildlife Fund - US ³⁶	321	0
The Conservation Fund (FY2016) ³⁷	226	0
Ducks Unlimited ³⁸	224	160 ³⁹
Natural Resources Defense Council ⁴⁰	184	0
The Trust for Public Land ⁴¹	134	0
National Audubon Society ⁴²	112	0
National Wildlife Federation ⁴³	80	12
Sierra Club Foundation ⁴⁴	77	0
Rocky Mountain Elk Foundation ⁴⁵	40	38 ⁴⁶
TOTAL NOT-FOR-PROFIT FUNDING	3,885,885	257
Share of total from hunting		6.6%
Share of total from trophy hunting		0.13%

To account for funding that would not occur in the absence of hunting, some attributions are made. Notably, the National Wildlife Federation has a significant share of hunter members and an attribution of 15% of funding has been recognized here based on previous analysis.⁴⁷ All non-government revenue to Ducks Unlimited are attributed to hunting.

In total, **the share of total not-for-profit funding arising from hunting is around 7%**. For trophy hunters only, the share is estimated to be 0.13%. Like the analysis of federal funding for conservation, this analysis paints a picture of hunters being mostly the beneficiaries of the conservation funding from others.

Total funding

Across the whole United States wildlife conservation effort assessed in this report, only \$1.3 billion out of the \$20.3 billion in total funding comes from hunting, or 6.4%. For trophy hunting, this amount would be around \$260 million or 0.13% of total conservation funding, which is only \$1 out of every \$770 of funding. This low figure suggests that even in the absence of trophy hunting almost all wildlife conservation activities would continue. To give some reference to the scale of this change, the funding reduction for the USFWS between FY2017 and FY2018 was 5%, and yet a similar total conservation effort occurred.

In a strict *'with and without trophy hunting'* comparison, the difference in funding may be even smaller if trophy hunters spend some of their \$260 million on other activities that also fund wildlife conservation.

Managing hunting is costly

Hunting requires regulation, monitoring, and law enforcement. But these activities come at a cost. It is of interest, therefore, to examine how much of the conservation funding by hunters is spent managing hunting itself, and how much is ‘left over’ for wildlife conservation activities. This helps a ‘with and without’ comparison.

State agencies generate around 20% of their own-source (non-federally granted) revenue from hunting activities, but they are also the agencies that spend the most on administering and regulating hunting. Evidence is sparse on the costs of administering hunting schemes separate from other agency costs.

In the absence of available data on costs of regulating hunting as a distinct activity for most state wildlife agencies, a comparison with agencies in other countries is informative. In the Australian state of Victoria, the Game Management Authority undertakes the narrow task of administering hunting licenses, including all associated enforcement and monitoring, and has an annual budget of AUD\$5 million to manage 50,157 hunting licenses.⁴⁸ However, the revenue raised from hunting licenses is less than half the cost of running the system, at AUD\$2.5 million.⁴⁹ The standard price in Victoria is USD\$41 per license, yet the administration cost is USD\$75 per license for this simple system with only eight different license types covering just three species.

In the United States, there are almost 15 million licensed hunters with 37 million licenses, tags, permits, and stamps. At a similar \$75 per license cost of administration, that amounts to \$2.8 billion per year. **Even if states could administer their licensing systems at half the cost of Victoria’s due to economies of scale, that is a \$1.4 billion cost of running regulated hunting, nearly twice the national license revenue of \$821 million in FY2015, and more than the total hunter contribution to overall conservation funding.**

For the revenue from hunting licenses to exceed the costs of running the licensing system, the total administration costs for each license in the United States must be less than \$22 per year. Whether this is possible is not clear, but it seems unlikely, as the following case studies demonstrate.

Whereas specific costs of hunting regulation are generally difficult to untangle from other costs for state conservation and wildlife agencies, in Wyoming the program costs for state species-management programs are itemized in their wildlife conservation reporting system. This provides an example of the relative scale of species monitoring and management costs, which are often devoted to promoting regulated hunting, and hunting revenues. The recent data are summarized in Table 5 for trophy hunting species of interest.

TABLE 5: WYOMING SPECIES HUNTING MANAGEMENT FUNDING SOURCES⁵⁰

Game (For FY 2016)	Funding from license sales (\$ ‘000)	Species Management costs (\$ ‘000)	Share of management paid by hunters
Black bear	350	856	40.9%
Grizzly bear (no hunting)	0	1,713	0%
Mountain lion	163	671	24.3%
Gray wolf (7.4% share in 2012)	0	1,196	0%
Total trophy game	513	4,436	11.6%

For the most at-risk species, such as grizzly bears and gray wolves, license sales ceased for a number of years due to declining populations. Even when hunting was previously allowed for gray wolves in 2012 and 2013, very little of the states’ costs of conserving the species were covered by trophy hunters, with just 7.4% of gray wolf program costs covered in 2012 by trophy hunters. In general,

hunting licenses for trophy species have covered 11.6% of the cost of the management programs for these species, ignoring other related conservation costs for land on which these programs take place.

Compared to other big game species, the trophy hunting of these species makes a much smaller financial contribution. For example, in Wyoming, hunting license sales cover 66% of the management costs on average for big game such as elk and deer species. Still, hunting license revenues do not exceed specific species management costs even in these cases.

The idea that trophy hunters are primarily the beneficiaries of the conservation activities paid for by others is supported by these data. In the case of the Yellowstone-area grizzly bears, the general public, rather than hunters, contributed funds to conserve this species for four decades after hunting ceased in 1975, implementing species monitoring, resolving conflicts and compensating for animal damage. If the trophy hunt is restored, hunters will contribute just \$600 per resident license (\$6,000 for non-residents). The species management costs are over \$1.7 million per year (and were \$2.6 million in FY2016). There would be minimal financial impact on the grizzly bear conservation effort if trophy hunting is restored, perhaps no impact at all.

Wildlife watchers outspend hunters

To answer the question about the relative economic benefits of non-consumptive wildlife watching compared to total hunting, we can compare trends in participation and gross economic activity associated with each. While such a comparison does not reveal the net economic benefit of either activity (they are gross, rather than net, measures), these trends shed light on the ways in which the economic value of wildlife is changing.

The top left panel of Figure 3 shows the total gross expenditures associated with wildlife watching and hunting since 1991. **Expenditure from wildlife watching has grown to be three times higher, at \$76 billion, than total hunting expenditure, at \$26 billion**. If we count just the big game expenditure, which was \$15 billion in 2016, the expenditure on wildlife watching is more than five times greater. **Wildlife watching expenditure has also grown twice as fast as hunting expenditure on average since 1991.**

On the right panels of Figure 3 are the participation numbers of people involved in hunting and wildlife watching, with the bottom panel showing the ratio. **At present, seven times more people participate in wildlife watching than hunting. Notably, 55% of hunters also participate in wildlife watching activities, making up 7% of wildlife watchers.**

Taking a look at some selected states, the number of visitors to Colorado state parks is up 10% in the year 2017, while hunting visits are up 3%.⁵¹ In South Dakota, the number of state park visits was thirty-four times more than the number of hunter visits in 2017.⁵²

Teasing out the economic scale of trophy hunting compared to overall hunting is difficult. The FHWR, despite its sample of nearly 4,000 hunters, found that native carnivore hunting was a tiny fraction of overall hunting. For bears, the only identified trophy species, the number of hunting days was 1 million out of 200 million total hunting days, or 0.5% of hunting days. The category 'Other big game' had 2 million hunting days, or 1%. The combined total provided an upper bound estimate of the share of trophy hunters, while the identified bear hunting days are a lower bound. Taking the midpoint of the range, of 1% of hunting days, and assuming spending is proportional to hunting days, then trophy hunters spent \$260 million out of a total hunting expenditure of \$26 billion.

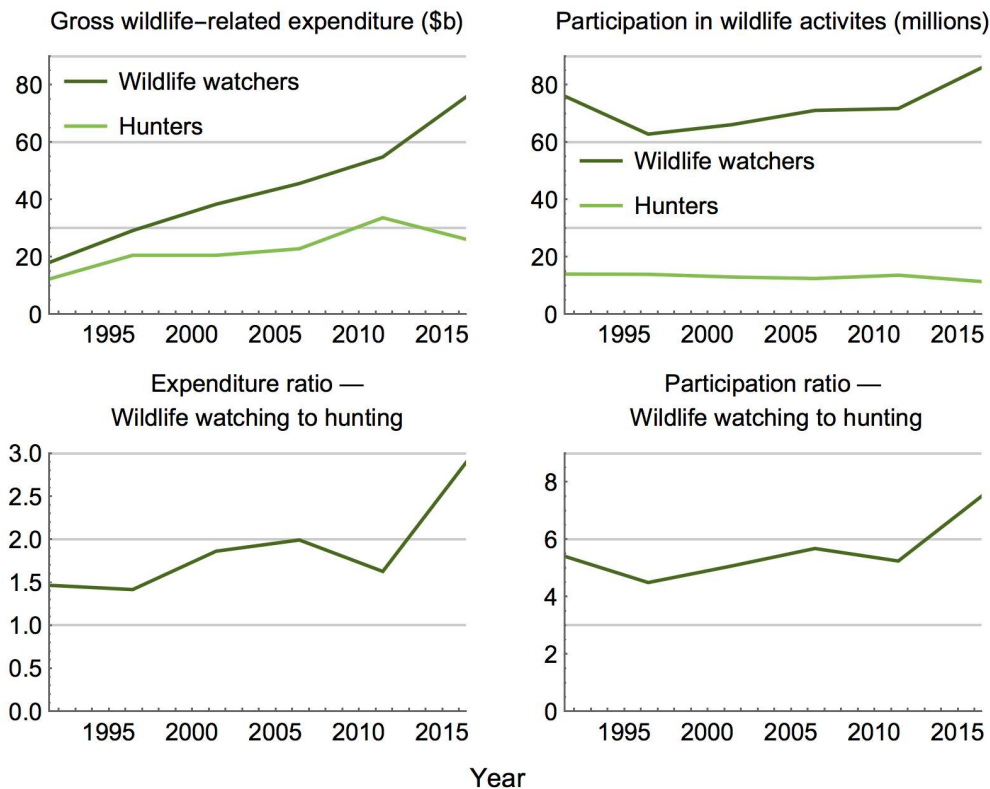


FIGURE 3: PARTICIPATION AND EXPENDITURE FROM 1991-2016 — HUNTING AND WILDLIFE WATCHING (WW)⁵³

In general, hunting appears to be declining in terms of participation and economic relevance. The number of licensed hunters peaked in 1982 at 16.7 million and is now at 15.4 million — a fall from 7.2% of the population to 4.7%, or 35% decline in relative participation.⁵⁴ This trend is well-understood by hunting organizations⁵⁵, which have been spending money and resources looking to bolster their declining, and aging, memberships. The relatively small economic contribution of hunting is made clear by examples of hunting bans that have been enacted with little to no economic effects. In 1990 California banned mountain lion hunting.⁵⁶ Costa Rica implemented a hunting ban on all trophy species in 2012. British Columbia in 2017 banned grizzly bear hunting, when formerly 250 bears were hunted each year.⁵⁷ Indeed, many extremely poor countries have banned trophy hunting. In 1977 Kenya banned almost all trophy hunting. Since that time a thriving wildlife ecotourism industry has emerged — an industry that has recently opposed a possible reintroduction of trophy hunting.⁵⁸ That these hunting bans were enacted with little economic effect suggests that the economic activity associated with hunting is relatively minor.

Conclusion

By analyzing in detail the funding sources and administration costs of conservation agencies it has been shown that rather than trophy hunting being a significant conservation input due to the revenue generated, trophy hunting is best seen as an output of conservation activity funded by others.

¹ For example, Tom Harvey. (2012). *The Greatest Conservation Story You've Never Heard*. Texas Parks and Wildlife Magazine. October. http://www.tpwmagazine.com/archive/2012/oct/ed_2_wsfr/, and USFWS. (2018). *What do hunters do for conservation?* <https://www.fws.gov/hunting/whatdo.html>

² It is common for hunter to claim their economic impact is due to their gross hunting-related expenditure. But this expenditure measure is misleading. In the absence of hunting (the ‘without’ scenario) hunters will still spend the same amount of money, but on a different set of recreational activities that would also provide an economic benefit. The \$26 billion hunting-related expenditure figure from the 2016 USFWS National Survey of Fishing, Hunting, and Wildlife-Associated Recreation is not a measure of the size of the net economic impact of hunting. It is a gross measure of current spending patterns. In the absence of hunting, it’s entirely possible that there will be an additional \$26 billion of spending elsewhere in the economy. Accounting for this means that the net economic effect of all hunting is minimal, and that of trophy hunting is even less.

Similarly, a complete ‘with and without’ comparison is important when considering the funding of conservation agencies. While hunters pay for licenses, these revenues are a gross figure, as there is also a cost associated with administering hunting. A complete ‘without’ scenario would have both reduced funding from hunting, but also reduced costs of regulating hunting.

³ USFWS. (2018). *2016 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation*. United States Fish and Wildlife Service. https://wsfrprograms.fws.gov/subpages/nationalsurvey/national_survey.htm

⁴ The 11 western states are Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

Vincent, C. et. al. (2017). *Federal Land Ownership: Overview and Data*. Congressional Research Service. R42346. <https://fas.org/sgp/crs/misc/R42346.pdf>

⁵ The United States Department of the Interior. (2018). *Budget Justifications and Performance Information Fiscal Year 2018*. United States Fish and Wildlife Service. <https://www.fws.gov/budget/2018/FY2018-FWS-Greenbook.pdf>

⁶ Which is 86.6% of the \$37 million from Duck Stamps plus 11% of the \$32 million of funding from Custom Duties on Arms and Ammunition. <http://www.nysenvirothon.com/Referencesandother/Hunting.pdf>

⁷ The United States Department of the Interior. (2018). *Budget Justifications and Performance Information Fiscal Year 2018*. Bureau of Land Management.

https://www.doi.gov/sites/doi.gov/files/uploads/fy2018_blm_budget_justification.pdf

BLM. (2017). *Public Land Statistics 2016*. Bureau of Land Management.

<https://www.blm.gov/sites/blm.gov/files/PublicLandStatistics2016.pdf>

⁸ USDA. (2017). *Fiscal Year 2018 Budget Justification*. United States Department of Agriculture. Forest Service. May 2017. <https://www.fs.fed.us/sites/default/files/usfs-fy18-budget-justification.pdf> and Budget Overview <https://www.fs.fed.us/sites/default/files/usfs-fy18-budget-overview.pdf>

⁹ The United States Department of the Interior. (2018). *Budget Justifications and Performance Information Fiscal Year 2018*. National Park Service. <https://www.nps.gov/aboutus/upload/FY-2018-NPS-Greenbook.pdf>

¹⁰ The colloquial name for the Federal Aid in Wildlife Restoration Act of 1937.

¹¹ Crafton et. al. (2018). *Guns, Excise Taxes, Wildlife Restoration, and the National Firearms Act*. Congressional Research Services. 15 March 2018. <https://fas.org/sgp/crs/misc/R45123.pdf>

¹² Smith, M and D. Molde. (2014). *Wildlife Conservation and Management Funding in the United States*.

Nevadans for Responsible Wildlife Management. <http://www.nrw.org/wildlife-management-funding-in-the-u-s/>

¹³ A recent survey suggests that 24% of archers bow hunt, meaning their 30% assumption is generous.

SFIA. (2017). *Archery single sport participation report*. Sports and Fitness Industry Association. <http://archerytrade.org/wp-content/uploads/2018/04/Archery-2017-Single-Sport-Report.pdf>

¹⁴ USFWS. (2018). *2016 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (FHWR)*. U.S. Fish and Wildlife Service. https://wsfrprograms.fws.gov/subpages/nationalsurvey/national_survey.htm and historical surveys <https://wsfrprograms.fws.gov/subpages/nationalsurvey/NatSurveyIndex.htm>

¹⁵ Smith, M and D. Molde. (2014). *Wildlife Conservation and Management Funding in the United States*.

Nevadans for Responsible Wildlife Management. p 9. <http://www.nrw.org/wildlife-management-funding-in-the-u-s/>

¹⁶ Siegel, M. (2018). How the firearms industry influences US gun culture, in 6 charts. The Conversation.

<https://theconversation.com/how-the-firearms-industry-influences-us-gun-culture-in-6-charts-92142>

¹⁷ The colloquial name for the Federal Aid in Sport Fish Restoration Act, as amended.

¹⁸ Sport Fish Restoration Act funding.

https://wsfrprograms.fws.gov/subpages/grantprograms/sfr/SFRA_Funding.pdf

¹⁹ Sport Fish Restoration Forecast of Gross Receipts and Program Distributions

<https://wsfrprograms.fws.gov/subpages/GrantPrograms/SFR/SFR-ReceiptsForecast.pdf>

²⁰ USCG. (2012). *National Recreational Boating Survey*. U.S. Coast Guard’s Boating Safety Division

<http://www.uscgboating.org/library/recreational-boating-survey/2012survey%20report.pdf>

²¹ This applies the hunting share of total revenues from small engine taxes to past revenues.

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