Final Report

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The Economic Impacts of Hunting, Fishing and Wildlife Watching in Colorado

Prepared for

Colorado Division of Wildlife

Prepared by

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EXECUTIVE SUMMARY

Background

In 1988, the Colorado Division of Wildlife (CDOW) selected BBC Research & Consulting (BBC) to build a model that estimated the economic effects of hunting and fishing in Colorado. CDOW used and maintained this model, and provided periodic updates of economic effects as new information became available. State and local government officials and CDOW personnel regularly used the model's results to help them educate the public, consider policy choices and allocate resources.

BBC last revised and updated the model in 2004, using 2002 data. In early 2008, CDOW asked BBC to complete a new update, based on the most recently available data. In addition to desiring a more current set of economic impact estimates, CDOW recognized that, due to circumstances in 2002 including drought, wildfires and a poor economy, estimates for 2002 may not accurately reflect the prevailing economic impact of hunting, fishing and wildlife watching in Colorado.

The estimates presented here are based on data from a number of different sources, including CDOW game harvest information for 2007, a survey of Colorado anglers conducted by CDOW in early 2008, CDOW expenditure data for Fiscal Year 2007 and the U.S. Fish and Wildlife Service's (USFWS) 2006 National Survey of Fishing, Hunting and Wildlife-Associated Recreation.

Overview of Statewide Economic Impacts of Hunting and Fishing

Hunting and fishing are an important part of Colorado's tourism economy. During 2007, the most recent year for which hunting and fishing data are available, there were roughly 12.7 million hunting and fishing activity days in Colorado. An activity day consists of one hunter or angler spending at least part of one day hunting or fishing. Colorado residents account for approximately 91 percent of hunting and fishing activity days.

Direct expenditures. Excluding purchases of hunting and fishing licenses (captured in CDOW expenditures), hunters and anglers spent an estimated $1.0 billion on trip expenses and sporting equipment in Colorado during 2007. In addition, CDOW spent $58 million on operations that directly support hunting and fishing in the state. (Information about the CDOW budget categories involved in this estimate are provided on page 10 of the main report.) Combining these, total direct expenditures in support of hunting and fishing were approximately $1.1 billion.

Total impact. The total economic impact of hunting and fishing is the sum of new dollars injected into the economy (trip expenses, sporting equipment purchases and CDOW expenditures that support hunting and fishing) and the secondary impact of the dollars that are re-spent within the economy. The secondary economic impact of hunting and fishing dollars during 2007 is estimated at $767 million, yielding a total impact of just over $1.8 billion.

Jobs. This level of economic activity supports an estimated 21,000 full-time jobs in Colorado. These jobs are located across the state, representing an important part of the economic base, particularly in some rural counties.

Residents and non-residents. Colorado residents provided 82 percent of statewide hunting and fishing trip and equipment expenditures. Non-resident hunters and anglers also provided an important boost for local economies:

- Non-resident hunters and anglers typically spent more money per day than residents did. For example, non-resident big game hunters spent an estimated $216 per day, while resident big game hunters spent about $106 per day.

- Non-resident hunters and anglers contributed $186 million, or 18 percent, of the statewide trip and equipment expenditures.

- Non-resident hunters and anglers brought money into the Colorado economy that would probably have gone to another state if not for Colorado's variety of hunting and fishing opportunities.

Comparison with 2002. Adjusting for inflation, hunters and anglers spent 17 percent more on trips and sporting equipment in 2007 than in 2002. Fishing activity days increased by 30 percent between 2002 and 2007 and hunting activity days increased by 6 percent. The total economic impact of these activities increased by 11 percent, with a similar number of jobs being supported statewide in each year. A more detailed comparison of 2002 and 2007 is presented in Section V of this report.

Overview of Statewide Economic Impacts of Wildlife Watching Activities

Estimates for wildlife watching activities in Colorado use a slightly different methodology to the hunting and fishing estimates. Estimates of trip and equipment expenditures and activity days for wildlife watching more than one mile from home are based on the wildlife watching sample of the 2006 USFWS national survey.

Total impact. During 2006, the most recent year for which wildlife watching expenditure data are available, trip and equipment expenditures that are primarily for wildlife watching activities more than one mile from home are estimated at $703 million. The secondary economic impact of these expenditures is estimated at $515 million, yielding a total estimated economic impact of $1.2 billion. This level of spending supports roughly 12,800 jobs in Colorado's economy.

Residents and non-residents. Wildlife watching by Colorado residents amounts to 41 percent of the total economic impact, with the remaining 59 percent coming from non-residents. Although non-residents represented roughly one-quarter of all activity days in 2006, non-residents spent considerably more money per day, on average, than residents when watching Colorado's wildlife.

People who watch wildlife and hunt or fish. Many people who watch wildlife in Colorado also hunt or fish in the state. Based on the 2006 USFWS survey, 12 percent of those who engaged in wildlife watching in Colorado in 2006 hunted or fished in the state in 2006. Among Colorado residents the figure is 20 percent; among non-residents the figure is 2 percent.

SECTION I.
Introduction

Background

In 1988, the Colorado Division of Wildlife (CDOW) selected BBC Research & Consulting (BBC) to build a model that estimated the economic effects of hunting and fishing in Colorado. The Division used and maintained this model and provided periodic updates of economic effects as new information became available. State and local government officials and CDOW personnel regularly used the model's results to help them educate the public, consider policy choices and allocate resources.

BBC last completed a model update in October 2004, providing estimates of the economic impact of hunting and fishing in 2002 and of wildlife watching in 2001. BBC's estimates and CDOW data both showed a decline in hunting and fishing activity as well as expenditures in 2002 relative to previous years. It was recognized that lower activity and total expenditures may have resulted from unfavorable conditions in 2002, including drought, wildfires and a weak economy. By providing a new set of estimates based on the most recently available data, BBC has been able to provide an assessment that more accurately reflects the prevailing economic impact of hunting, fishing and wildlife watching in Colorado.

Objectives

CDOW specified several objectives for this update.

- Work with CDOW personnel to integrate the most recently available information and refine working assumptions;
- Provide statewide and individual county estimates of the economic effects of elk hunting, deer hunting, other big game hunting, small game hunting and fishing;
- Distinguish between resident and non-resident impacts; and
- Provide a statewide estimate of the economic effects of wildlife watching, using a methodology similar to that for hunting and fishing.

Process

BBC completed six tasks in order to update the model. These tasks included:

- **Project initiation** — BBC met with CDOW staff at the beginning of this project to assemble the data needed from CDOW and to review data sources and model assumptions.

- **Data collection** — BBC obtained the most recent available data from CDOW, the U.S. Fish and Wildlife Service, the U.S. Bureau of the Census, the Colorado State Demographer's Office, and the IMPLAN Group, Inc.

- **Core model implementation** — BBC updated the CDOW economic impact model with new data inputs and made adjustments to the model implementation where necessary to accommodate changes such as new Game Management Units, revised survey questions and new data sources.

- **Hunting and fishing results** — BBC developed estimates of the economic impacts of hunting and fishing for the most recent available year (2007).

- **Wildlife watching results** — BBC developed estimates of the economic impacts of wildlife watching in 2006.

- **Final report** — BBC summarized the results of the model in a report delivered to CDOW staff.

Section II of this report provides an overview of the economic impact model.

Model Capabilities

The model provides estimates of the annual economic impacts of hunting and fishing activity for each county and statewide for the 2007 hunting and fishing seasons. All economic impact results are reported in 2007 dollars. Economic impacts are reported in terms of activity days, trip and equipment expenditures, total economic impacts (measured in terms of output/sales) and jobs.

Hunting impacts can be further broken down into impacts related to hunting several key species, including elk, deer, other big game and small game. Economic impacts are further divided into impacts resulting from Colorado resident hunting and fishing activity and those resulting from non-resident activity.

Economic impacts associated with wildlife watching activities are available for residents and non-residents, but only at the statewide level. The model reports the economic impacts resulting from wildlife watching in 2006, the most recent year for which data are available.

Section III of this report describes statewide results and Section IV of this report describes county-level results. Section V of this report compares results of this updated model with the 2002 hunting and fishing estimates from the last model update.

SECTION II.
Model Overview

The updated economic impact model developed for CDOW combines the most recently available information from a variety of sources to generate estimates of the impacts of hunting, fishing and wildlife watching in Colorado. This section of the report provides an overview of the model.

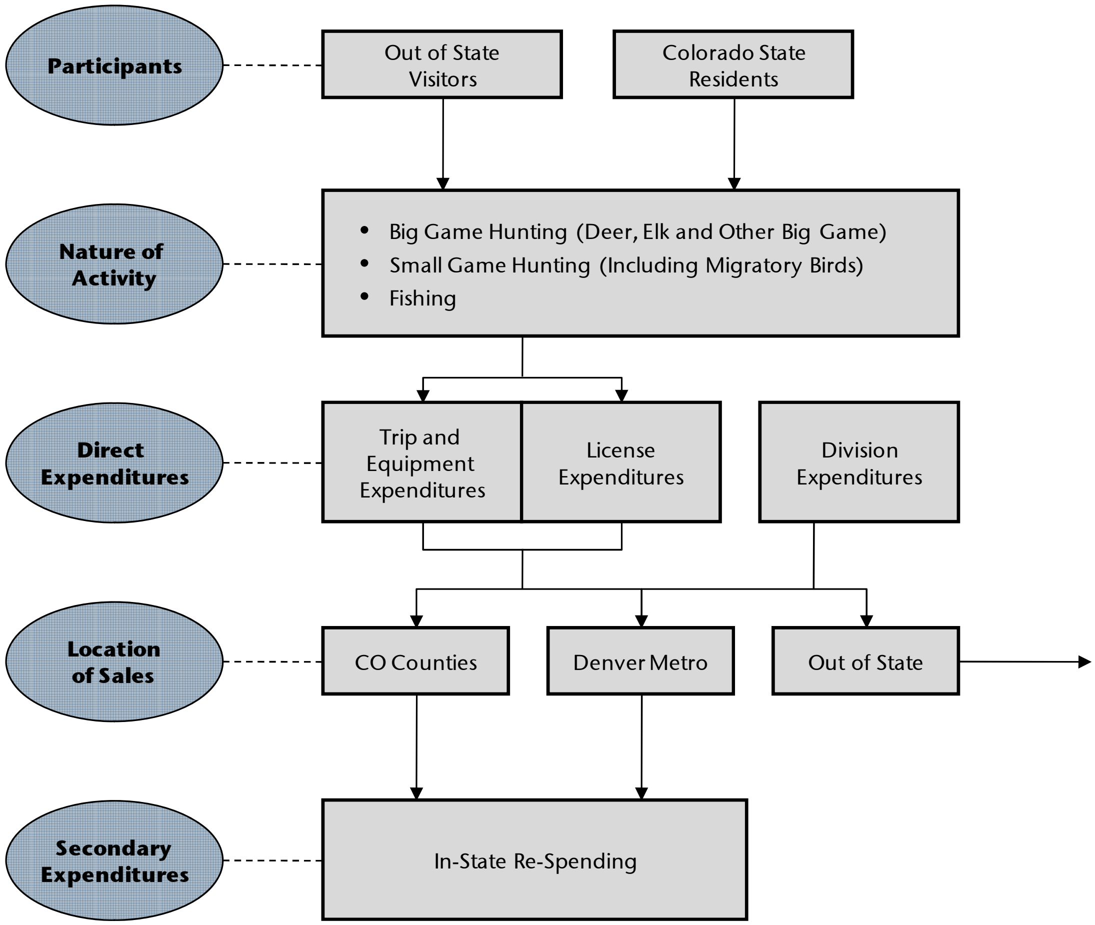
General model structure. The overall structure of the economic impact model is shown in Exhibit II-1, on the next page. The model begins with information about resident and non-resident participants in Colorado. Estimates of equipment expenditures and per-visitor day direct expenditures for trip costs come from the U.S. Fish and Wildlife Service and U.S. Bureau of the Census "2006 National Survey of Fishing, Hunting, and Wildlife Associated Recreation." Estimates of the number of hunting and fishing activity days, along with their location, come from CDOW surveys and license sales.

The model then estimates direct expenditures, by type of visitor and activity, based on estimated expenditures per visitor day and per trip (specific to each type of activity and each type of visitor), combined with data on CDOW expenditures that support hunting and fishing activities. The location of sales depends on the type of expenditure, the locations where hunting and fishing activities take place and where equipment or trip support services are purchased.

Secondary expenditures, reflecting the re-spending of hunting and fishing dollars within Colorado, are estimated using the IMPLAN input-output model originally developed by the U.S. Forest Service. The model then combines the direct and secondary expenditures to produce total economic impact estimates and estimates of total employment related to hunting and fishing activities.

The wildlife watching component of the model follows a similar structure. However, due to data limitations, there is no county-level detail available for wildlife watching impacts. Economic effects of wildlife watching are only provided at a statewide level.

Exhibit II-1.
Overall Economic Impact Model Structure



Source: BBC Research & Consulting.

Inputs to the model. Data for the model come from a variety of sources and are depicted in Exhibit II-2:

- CDOW provided data on hunting and fishing activity levels by location and species, direct CDOW expenditures and license agent commissions, and the geographic and economic relationship between Game Management Units and county boundaries;

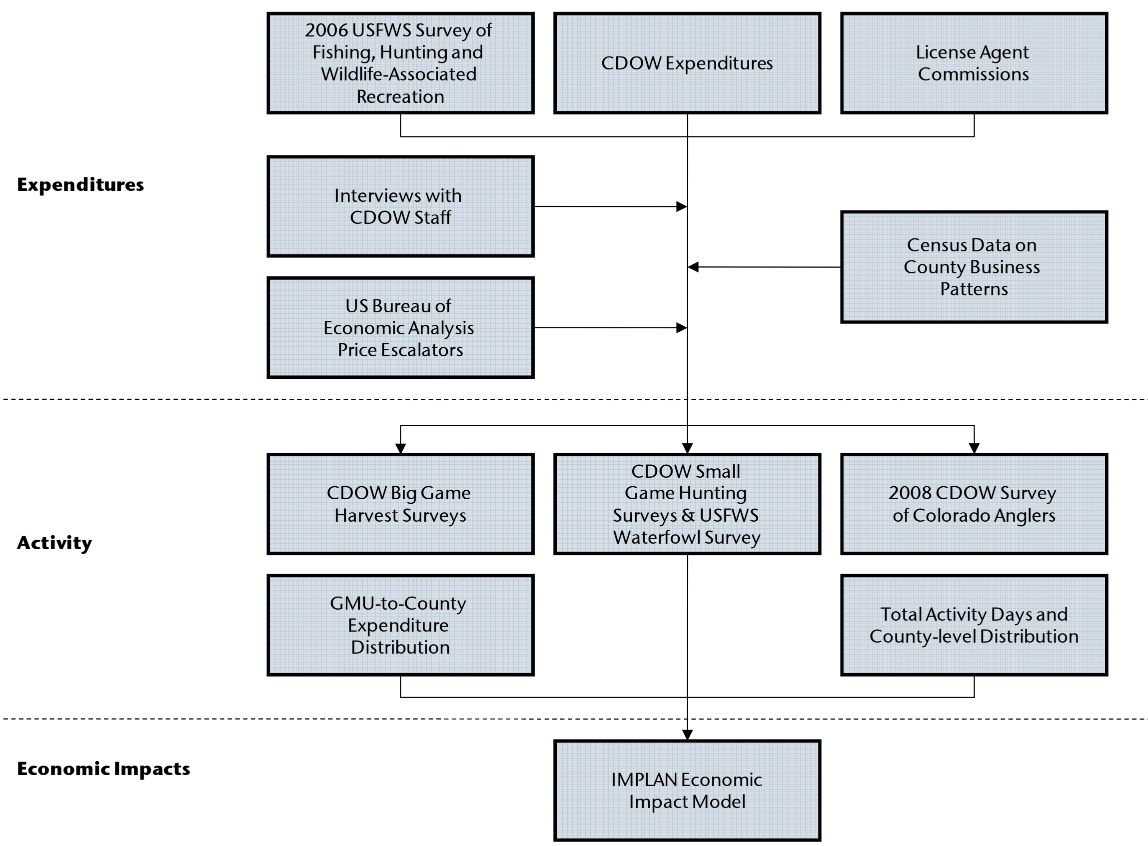
- Colorado-specific information in the U.S. Fish and Wildlife Service and U.S. Bureau of the Census "2006 National Survey of Fishing, Hunting, and Wildlife Associated Recreation" provides estimates of hunting, fishing and wildlife watching expenditures in Colorado per visitor and per visitor day;

- Data from the U.S. Census County Business Patterns was used to apportion equipment expenditures based on the locations of retail outlets for hunting, fishing and wildlife watching equipment;

- Data from the U.S. Department of Commerce, Bureau of Economic Analysis was used to convert all dollar figures into 2007 dollars; and

- The IMPLAN economic impact model was used to estimate secondary economic impacts ("re-spending" effects) and total employment impacts.

Exhibit II-2.
Inputs to the Model



Source: BBC Research & Consulting.

Model outputs. Apart from producing overall statewide estimates of the total economic impact of hunting, fishing and wildlife watching activities, the model is able to produce a variety of more specialized results. As summarized in Exhibit II-3, the model can show results for hunting and fishing impacts at both the state and county levels, as well as results for wildlife watching impacts at the state level. The model can also generate impact results for more specific activities, such as elk hunting or small game hunting. A variety of economic measures are available from the model, including direct expenditures, total output and jobs.

Exhibit II-3.
Available Model Results

Source:
BBC Research & Consulting.

Geography
- County-level
- State-level

Residency
- Colorado
- Non-resident

Activity
- Elk hunting
- Deer hunting
- Other big game hunting
- Small game hunting
- Fishing
- Wildlife watching

Economic Impacts
- Direct expenditures
- Secondary spending
- Total impact
(direct and secondary)
- Jobs
- Employee earnings

Direct expenditure categories
- Trip expenses
- Equipment purchases
- CDOW expenditures

SECTION III.
Statewide Results

Statewide Economic Impacts of Hunting and Fishing

Hunting and fishing are an important and sizable portion of Colorado's tourism economy.

Exhibit III-1 summarizes direct expenditures, total economic impacts and total jobs in Colorado related to hunting and fishing in 2007. Overall, the economic impacts of fishing were greater than those of hunting, reflecting the fact that fishing activity days represented more than 80 percent of all activity days. However, the economic impact of each hunting day is nearly twice that of an individual fishing day, on average. Among the major game species hunted in Colorado in 2007, the economic impacts of elk hunting were the largest, followed by deer hunting.

Exhibit III-1.
Statewide Economic Impacts of Hunting and Fishing in 2007

Activity	Direct expenditures[1] ($ in thousands)	Total impact[2] ($ in thousands)	Total[3] jobs
Elk hunting	$172,700	$295,500	3,400
Deer hunting	58,300	99,900	1,160
Other big game hunting	4,700	8,300	100
Fishing	725,200	1,259,400	14,610
Small game hunting	56,900	98,700	1,350
CDOW expenditures	58,500	81,500	730
Total	**$1,076,300**	**$1,843,300**	**21,350**

Note: Measured in 2007 dollars.

1. Trip and equipment expenditures and CDOW expenditures in support of these activities.
2. Direct expenditures plus secondary spending by businesses and households (multiplier effects).
3. Includes job creation from direct and secondary expenditures.

Source: BBC Research & Consulting, based on data from CDOW and USFWS 2006 national survey.

Direct expenditures. Hunters and anglers spent an estimated $1.0 billion on trip expenses[1] and sporting equipment[2] (direct expenditures) in Colorado during 2007. Expenditures by Colorado residents made up about 82 percent of this total. Expenditures per day were greater, on average, for non-residents than for Colorado residents. In addition, CDOW spent an estimated $58 million on items that directly support hunting and fishing activities in the state. (For a description of included CDOW budgetary groups, see below.[3]) When combined, total direct expenditures are estimated to equal $1.1 billion.

Total economic impacts. Businesses receive revenue from hunter and angler purchases and use a portion of this money to pay employees and purchase goods and services that support business operations. Thus, the hunter and angler expenditures re-circulate in the local economy — providing an economic impact beyond just the original expenditures. This additional re-spending impact is often termed a "multiplier" effect or secondary impact.

The total economic impact of the hunting and fishing industry consists of both new dollars injected into the economy from hunter and angler trip expenses and sporting equipment purchases (direct expenditures) and the secondary impact as these dollars are re-spent within the economy. The secondary economic impact of hunting and fishing dollars during 2007 is estimated at $767 million. Adding this figure to the trip and equipment purchases, the total estimated impact is $1.8 billion.

Jobs. A portion of the direct expenditures of hunters and anglers and the subsequent re-spending of these revenues pay for wages and salaries that currently support an estimated 21,000 full-time jobs in Colorado. These jobs, located across Colorado, form an important component of the local economic base, particularly in certain rural counties.

Activity days. During 2007, the most recent year for which data are available, there were about 12.7 million hunting and fishing activity days. An activity day consists of one hunter or angler spending at least part of one day hunting or fishing. Resident hunter and angler activity days comprised approximately 91 percent of the total hunting and fishing activity days in Colorado. Non-resident hunter and angler activity days were 9 percent of the total. The portion of non-resident activity days varied considerably for different activities: non-residents were responsible for less than 5 percent of fishing activity days but more than one-third of big game activity days. Exhibit III-2 on the next page shows these results.

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[1] Includes expenditures on the following goods and services: food, lodging, public transportation, private transportation, guide fees, public land access fees, private land access fees, equipment rental, boat fuel, other boating costs, and heating and cooking fuel. Excludes expenditures on hunting and fishing licenses as these are represented by CDOW expenditures.

[2] Includes some or all of the expenditures on the following items: guns and rifles, ammunition, other hunting equipment, fishing gear, camping equipment, binoculars, clothing, taxidermy, boats, trucks, campers, recreational vehicles, magazines and books, membership dues and contributions, film, bird food, and food for other wildlife.

[3] CDOW expenditures include the following expenditure groups: operating (i.e. instate travel, supplies, motor vehicles, etc.), capital (IT, equipment, etc.), and all other expenditures in direct support of fish and wildlife management.

Exhibit III-2.
Hunting and Fishing Activity Days, 2007

Activity	Resident activity days (thousands)	Non-resident activity days (thousands)	Total activity days (thousands)
Big game hunting	1,005	596	1,601
Small game hunting	582	23	605
Fishing	9,995	471	10,466
Total	**11,582**	**1,090**	**12,672**

Source: BBC Research & Consulting, based on fishing and hunting activity data provided by CDOW.

Statewide Economic Impacts of Hunting and Fishing by Residents and Non-Residents

Resident and non-resident hunters and anglers provide an important boost for local economies and bring money into the Colorado economy that may well be spent in another state if not for Colorado's unique outdoor experience. Residents contributed approximately $832 million, or 82 percent of the statewide trip and equipment expenditures (excluding direct CDOW expenditures). Non-residents contributed $186 million, or 18 percent, of these direct expenditures.

Daily expenditures. Non-residents typically spent more money per day than residents. For example, non-resident big game hunters spent an estimated $216 per day in 2007, while resident big game hunters spent about $106. Exhibit III-3 shows additional information about average per day expenditures.

Exhibit III-3.
Average Expenditures per Hunter and Angler per Day, 2007

Activity	Resident $ per day	Non-resident $ per day
Big game hunting	$106	$216
Small game hunting	$94	$87
Fishing	$67	$118

Note: Measured in 2007 dollars.
Source: BBC Research & Consulting, based on 2006 USFWS national survey.

Expenditure type. Exhibits III-4 and III-5, on the next page, show how hunters and anglers spent their trip and equipment expenditures in Colorado. For both residents and non-residents, the primary trip expenditures – food, lodging and transportation – represented a sizable portion of total direct expenditures. These trip expenditures made up approximately 40 percent of the total for residents and 62 percent of the total for non-residents. Guide and membership fees were a much larger share of non-resident than resident expenditures, while equipment expenditures (for sporting goods purchased in Colorado) were a much greater share of resident expenditures.

Exhibit III-4.
Direct Expenditures by Expenditure Type for Residents

Source:

BBC Research & Consulting, based on 2006 USFWS national survey.

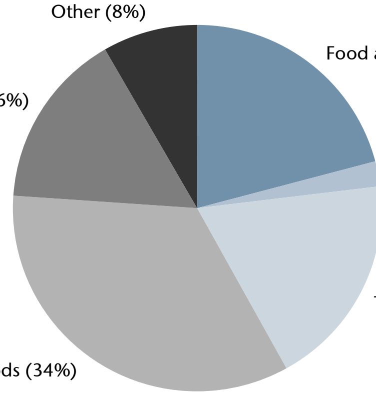
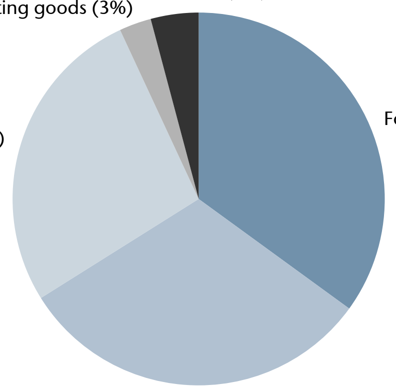


Exhibit III-5.
Direct Expenditures by Expenditure Type for Non-residents

Source:

BBC Research & Consulting, based on 2006 USFWS national survey.



Expenditures by activity. Exhibit III-6 shows additional detail for expenditures by place of residence and hunting or fishing activity. Non-residents were responsible for more than one-half of all direct expenditures relating to deer and elk hunting. Residents contributed more than 90 percent of fishing-related direct expenditures.

Exhibit III-6.
Hunting and Fishing Trip and Equipment Expenditures by Residents and Non-Residents, 2007

Activity	Resident ($ in thousands)	Non-resident ($ in thousands)	Total direct expenditures ($ in thousands)
Hunting			
Deer	$29,600	$28,700	$58,300
Elk	73,200	99,500	172,700
Other big game	4,100	600	4,700
Small game	54,900	2,000	56,900
Subtotal	**$161,800**	**$130,800**	**$292,600**
Fishing	669,700	55,500	725,200
Total	**$831,500**	**$186,300**	**$1,017,800**

Note: Measured in 2007 dollars.

Source: BBC Research & Consulting, based on CDOW hunting and fishing activity data and 2006 USFWS national survey.

Statewide Economic Impacts of Wildlife Watching Activities

Estimates for wildlife watching activities in Colorado use a slightly different methodology to the hunting and fishing estimates. Hunting and fishing figures are based on a combination of estimates of per-day expenditures from the 2006 USFWS national survey and CDOW estimates of activity days for 2007. For wildlife watching, all estimates are based on the wildlife watching sample of the 2006 USFWS national survey as CDOW does not collect activity day data for wildlife watching. All estimates provided here are for wildlife watching activities that take place at least one mile from home.

Total economic impacts. Trip and equipment expenditures that are primarily for wildlife watching activities more than one mile from home are estimated at $703 million for calendar year 2006 (the most recent year available). The secondary economic impact of these expenditures is estimated at $515 million, yielding a total estimated impact of $1.22 billion. Direct and secondary expenditures at this level are estimated to support approximately 12,800 jobs in Colorado.

Wildlife watching by Colorado residents made up about $498 million, or 41 percent of the total economic impact of wildlife watching in 2006. Non-residents watching wildlife in Colorado contributed an estimated $720 million to the Colorado economy. Exhibit III-7 shows the total economic impacts of wildlife watching in Colorado.

Exhibit III-7. Economic Impact of Wildlife Watching in Colorado, 2006

	Direct expenditures[1] ($ in thousands)	Total impact[2] ($ in thousands)	Total[3] jobs
Non-resident	$417,400	$720,300	7,220
Resident	285,800	497,900	5,560
Total	**$703,200**	**$1,218,200**	**12,780**

Note: Measured in 2007 dollars.

1. Trip and equipment expenditures in support of wildlife watching.
2. Direct expenditures plus secondary spending by businesses and households (multiplier effects).
3. Includes job creation from direct and secondary expenditures.

Source: BBC Research & Consulting, based on 2006 USFWS national survey.

Expenditures per day. Although residents were responsible for approximately three-quarters of all wildlife watching activity days, non-residents spent considerably more per day, on average, than residents. Estimates of total activity days and daily expenditures for residents and non-residents are shown in Exhibit III-8.

Exhibit III-8. Activity Days and Daily Direct Expenditures for Wildlife Watching, 2006

	Activity days (thousands)	Per day expenditure
Non-resident	2,394	$174
Resident	7,010	$41
Total	**9,404**	**N/A**

Note: Per day expenditures measured in 2007 dollars.

Source: BBC Research & Consulting, based on 2006 USFWS national survey.

People who watch wildlife and hunt or fish. Many people who watch wildlife in Colorado also hunt or fish in the state. Based on the wildlife watching sample of the 2006 USFWS survey, 12 percent of the individuals who watched wildlife in Colorado in 2006 also hunted or fished in the state in that year. Among Colorado residents, the figure was 20 percent; among non-residents the figure was 2 percent.

SECTION IV.
County-Level Results

The hunting and fishing portion of the model also estimates the economic effects of these activities for individual counties. In absolute terms, the largest impacts on business output and employment from hunting and fishing take place in the Colorado counties with the largest populations and economies. This occurs because a large portion of the equipment expenditures occurs where hunters and anglers live. Consequently, urban areas can see large economic contributions from hunting and fishing, even though urban areas have little or no local hunting and fishing activity. Three counties in the Denver Metropolitan Area, as well as El Paso, Larimer and Boulder County, have more than 1,000 jobs supported by hunting and fishing.

In relative terms, hunting and fishing activity has a greater economic impact in some of Colorado's rural counties. Exhibit IV-1 shows the counties that are most dependent on hunting and fishing activity. In Jackson County, hunting and fishing activities directly or indirectly support more than 12 percent of all local jobs.

Exhibit IV-1.
Colorado Counties with Largest Proportion of Employment Related to Hunting and Fishing, 2007

County	Jobs from hunting and fishing	Total jobs in county	Percent of total jobs
Jackson	144	1,192	12.1%
San Juan	39	580	6.7%
Mineral	51	813	6.3%
Rio Blanco	305	5,224	5.8%
Grand	566	11,186	5.1%
Gunnison	615	13,402	4.6%
Lake	140	3,150	4.4%
Moffat	325	8,036	4.1%
Hinsdale	26	690	3.7%
Chaffee	385	10,849	3.5%

Source: BBC Research & Consulting. Total county employment from U.S. Department of Commerce, Bureau of Economic Analysis estimates for 2006.

Exhibit IV-2 shows direct expenditures (i.e., hunting and fishing trip and equipment expenditures and estimated CDOW expenditures) for each of Colorado's 64 counties. This exhibit also shows the estimated total economic impacts and the number of jobs sustained by these activities.

Exhibit IV-2.
Estimated Hunting and Fishing Economic Impacts by County, 2007

County	Direct Expenditures[1] ($ in thousands)	Total Impact[2] ($ in thousands)	Jobs[3]
Adams	$37,090	$64,270	681
Alamosa	11,960	20,330	215
Arapahoe	62,860	109,390	1,344
Archuleta	11,300	19,170	206
Baca	1,070	1,610	15
Bent	1,460	2,320	21
Boulder	50,460	87,900	1,099
Broomfield	5,870	10,050	127
Chaffee	20,840	35,620	385
Cheyenne	590	800	7
Clear Creek	3,400	5,620	63
Conejos	2,590	4,290	46
Costilla	860	1,270	9
Crowley	500	640	5
Custer	3,160	5,220	53
Delta	16,310	27,840	297
Denver	77,670	131,570	1,176
Dolores	1,640	2,570	26
Douglas	34,370	59,940	668
Eagle	38,860	67,640	908
El Paso	57,470	99,190	1,120
Elbert	9,500	16,670	197
Fremont	9,650	16,350	169
Garfield	31,700	54,420	579
Gilpin	470	610	6
Grand	28,680	49,270	566
Gunnison	31,180	53,140	615
Hinsdale	1,820	3,000	26
Huerfano	4,220	7,010	71
Jackson	9,710	14,020	144
Jefferson	67,110	116,340	1,420
Kiowa	690	960	8
Kit Carson	2,470	3,980	35
La Plata	25,170	43,340	477
Lake	6,730	11,480	140

Note: Measured in 2007 dollars.
1. Trip and equipment expenditures and CDOW expenditures in support of these activities.
2. Direct expenditures plus secondary spending by businesses and households (multiplier effects).
3. Includes job creation from direct and secondary expenditures.

Source: BBC Research & Consulting, based on hunting and fishing activity data from CDOW and 2006 USFWS national survey.

Exhibit IV-2 (Continued).
Estimated Hunting and Fishing Economic Impacts by County, 2007

County	Direct Expenditures[1] ($ in thousands)	Total Impact[2] ($ in thousands)	Jobs[3]
Larimer	$89,070	$154,830	1,739
Las Animas	6,800	11,470	118
Lincoln	1,940	3,090	26
Logan	7,470	12,620	134
Mesa	43,980	76,100	813
Mineral	2,660	4,430	51
Moffat	18,450	31,170	325
Montezuma	12,230	20,790	221
Montrose	17,150	29,180	320
Morgan	3,940	6,540	52
Otero	3,090	5,020	54
Ouray	2,110	3,440	37
Park	10,450	17,790	207
Phillips	990	1,500	11
Pitkin	14,250	24,850	327
Prowers	3,350	5,500	53
Pueblo	38,270	65,990	697
Rio Blanco	17,890	30,040	305
Rio Grande	7,880	13,350	136
Routt	27,980	45,630	528
Saguache	2,280	3,350	23
San Juan	2,390	3,970	39
San Miguel	10,090	17,380	227
Sedgwick	1,190	1,850	14
Summit	29,710	51,800	708
Teller	5,330	8,960	107
Washington	1,050	1,600	11
Weld	22,480	39,210	372
Yuma	2,410	4,020	34
Total	**$1,076,310**	**$1,843,310**	**20,614**

Note: Measured in 2007 dollars. Values may not sum due to rounding.
1. Trip and equipment expenditures and CDOW expenditures in support of these activities.
2. Direct expenditures plus secondary spending by businesses and households (multiplier effects).
3. Includes job creation from direct and secondary expenditures.

Source: BBC Research & Consulting, based on hunting and fishing activity data from CDOW and 2006 USFWS national survey.

Exhibit IV-3 provides additional detail regarding the county-level economic impacts of hunting and fishing. In this exhibit, total economic impacts are shown in five categories: resident and non-resident hunting impacts, resident and non-resident fishing impacts, and impacts from expenditures by CDOW.

Exhibit IV-3.
Economic Impacts by County, Activity and Residence, 2007

	Hunting ($ in thousands)		Fishing ($ in thousands)		CDOW[1]	Total Impact
County	Resident	Non-Resident	Resident	Non-Resident	($ in thousands)	($ in thousands)
Adams	$6,540	$2,220	$53,630	$1,660	$220	$64,270
Alamosa	2,490	4,490	7,250	5,320	790	20,330
Arapahoe	19,950	4,750	79,260	5,210	210	109,390
Archuleta	2,670	9,040	4,720	1,840	890	19,170
Baca	370	240	790	40	160	1,610
Bent	270	110	1,540	20	380	2,320
Boulder	16,280	2,410	66,610	2,460	140	87,900
Broomfield	2,000	280	7,420	260	90	10,050
Chaffee	3,970	2,910	25,600	2,240	900	35,620
Cheyenne	290	160	170	10	170	800
Clear Creek	880	410	4,100	150	80	5,620
Conejos	480	120	1,760	1,480	460	4,290
Costilla	180	220	410	20	440	1,270
Crowley	160	40	270	10	160	640
Custer	600	630	3,180	390	410	5,220
Delta	3,360	7,990	14,980	1,220	300	27,840
Denver	13,450	7,860	76,740	9,370	24,150	131,570
Dolores	300	1,560	490	130	90	2,570
Douglas	6,690	1,400	48,430	3,300	120	59,940
Eagle	18,840	9,820	35,670	3,150	160	67,640
El Paso	14,840	4,420	72,820	4,830	2,270	99,190
Elbert	2,600	1,060	11,500	760	750	16,670
Fremont	1,850	940	12,370	320	880	16,350
Garfield	8,430	16,390	24,670	1,230	3,700	54,420
Gilpin	330	110	80	0	70	610
Grand	7,220	6,690	32,490	1,680	1,190	49,270
Gunnison	7,230	12,270	25,550	7,200	890	53,140
Hinsdale	280	210	1,070	660	780	3,000
Huerfano	860	1,220	4,050	350	530	7,010
Jackson	1,660	4,350	6,690	600	730	14,020
Jefferson	18,950	3,670	89,200	4,250	260	116,340
Kiowa	200	110	460	30	160	960
Kit Carson	720	300	2,180	70	710	3,980
La Plata	5,780	9,510	19,010	6,050	2,980	43,340
Lake	1,970	940	7,770	720	80	11,480

Note: Measured in 2007 dollars.
Total economic impacts include direct expenditures plus secondary spending by business and households (multiplier effects).
1. Total impacts from CDOW in support of hunting and fishing.

Source: BBC Research & Consulting, based on hunting and fishing activity data from CDOW and 2006 USFWS national survey.

Exhibit IV-3 (continued).
Economic Impacts by County, Activity and Residence, 2007

County	Hunting ($ in thousands) Resident	Hunting ($ in thousands) Non-Resident	Fishing ($ in thousands) Resident	Fishing ($ in thousands) Non-Resident	CDOW[1] ($ in thousands)	Total Impact ($ in thousands)
Larimer	$20,580	$5,900	$117,430	$4,090	$6,820	$154,830
Las Animas	930	1,340	8,020	670	510	11,470
Lincoln	570	230	1,490	60	750	3,090
Logan	1,820	310	9,890	80	520	12,620
Mesa	9,790	10,410	51,060	2,110	2,720	76,100
Mineral	760	600	1,710	1,020	340	4,430
Moffat	6,190	16,650	6,570	490	1,280	31,170
Montezuma	2,380	5,860	9,100	2,570	890	20,790
Montrose	3,680	7,830	14,390	2,500	790	29,180
Morgan	1,290	360	3,010	170	1,710	6,540
Otero	1,020	380	3,290	160	170	5,020
Ouray	410	690	1,930	180	240	3,440
Park	2,310	1,150	13,710	520	90	17,790
Phillips	290	110	560	30	510	1,500
Pitkin	6,350	2,040	13,640	2,150	670	24,850
Prowers	1,010	290	3,330	160	710	5,500
Pueblo	5,400	1,670	55,860	1,770	1,280	65,990
Rio Blanco	4,870	20,970	2,670	350	1,180	30,040
Rio Grande	1,360	1,680	5,050	3,750	1,510	13,350
Routt	8,380	14,190	19,560	2,710	780	45,630
Saguache	630	880	640	50	1,150	3,350
San Juan	570	800	1,690	140	780	3,970
San Miguel	4,410	4,280	7,710	730	250	17,380
Sedgwick	420	100	800	20	510	1,850
Summit	12,730	1,480	34,830	2,050	720	51,800
Teller	1,780	530	6,420	130	90	8,960
Washington	240	90	730	30	510	1,600
Weld	7,130	1,460	23,080	860	6,680	39,210
Yuma	1,010	240	1,640	70	1,050	4,020
Total	**$281,000**	**$221,370**	**$1,162,740**	**$96,650**	**$81,510**	**$1,843,310**

Note: Measured in 2007 dollars.
Total economic impacts include direct expenditures plus secondary spending by business and households (multiplier effects).
1. Total impacts from CDOW support of hunting and fishing.

Source: BBC Research & Consulting, based on hunting and fishing activity data from CDOW and 2006 USFWS national survey.

SECTION V.
Comparison with Previous Impact Estimates

When updating an economic impact model, it is informative to compare the results of the new model and most recent information with prior economic impact estimates. CDOW updated the original model estimates in 1997 using 1996 data and BBC updated the model in 2004 using 2002 data. As there were substantial methodological changes made to the model after 1997, comparisons are only made here between the 2002 and 2007 estimates.

Comparison with 2002 results. Exhibit V-1 compares the direct expenditures and total economic impact for the 2007 hunting and fishing season with estimates for the 2002 hunting and fishing seasons. After adjusting for inflation, both the total direct expenditure on hunting and fishing and the total economic impact of these activities in Colorado increased from 2002 to 2007.

Exhibit V-1.
Comparison of Hunting and Fishing Expenditures and Impacts, 2002 and 2007

	Direct Expenditures[1] ($ in thousands)		Total Impact[2] ($ in thousands)	
	2002	2007	2002	2007
Big game hunting	$276,300	$235,700	$491,500	$403,700
Small game hunting	93,000	56,900	168,000	98,700
Fishing	501,000	725,200	896,000	1,259,400
CDOW expenditures	53,400	58,600	99,700	81,500
Total	**$923,700**	**$1,076,300**	**$1,655,200**	**$1,843,300**

Note: Measured in 2007 dollars.

1. Trip and equipment expenditures and CDOW expenditures in support of these activities.
2. Direct expenditures plus secondary spending by businesses and households (multiplier effects).

Source: BBC Research & Consulting, based on CDOW data and USFWS national surveys.

The year of the last update, 2002, was recognized to be a poor year for hunting and fishing in Colorado due to a number of factors, such as drought and wildfires. The increased economic impact of hunting and fishing in 2007 can partly be explained by an increase in total activity days, particularly for fishing. There were a total of 10.5 million fishing activity days in 2007, compared to 8.05 million in 2002. Big game activity days also increased between these two periods, although small game activity days declined. Exhibit V-2 compares the total activity days for 2002 and 2007.

Exhibit V-2.
Hunting and Fishing Activity Days, 2002 and 2007

Source: BBC Research & Consulting, based on CDOW data.

	Total activity days (in thousands)	
	2002	**2007**
Big game hunting	1,421	1,607
Small game hunting	672	605
Fishing	8,054	10,466
Total	10,147	12,672

Despite the overall increase in activity days, the total number of non-resident activity days has declined between 2002 and 2007. As non-residents tend to spend more per day than residents, this has resulted in the increase in direct expenditures and total impacts being small relative to the increase in total activity days. Between 2002 and 2007, hunting and fishing direct expenditures increased by approximately 17 percent, while total activity days increased by approximately 25 percent.

Exhibit V-3 compares the per-day expenditures for hunting and fishing in 2002 and 2007. Although the figures for Colorado residents are broadly similar for both years, average hunting expenditures per day have declined for non-residents while average per-day fishing expenditures for non-residents have increased. Note that methodological differences between the two study periods may account for some of the differences in expenditures and that sample sizes in the 2006 USFWS national survey for some non-resident activities were small.

Exhibit V-3.
Per-day Expenditures, 2002 and 2007

	Resident $ per day		Non-resident $ per day	
	2002	**2007**	**2002**	**2007**
Big game hunting	$112	$106	$351	$216
Small game hunting	$124	$94	$201	$87
Fishing	$60	$67	$68	$118

Note: Measured in 2007 dollars.
Source: BBC Research & Consulting from 2001 and 2006 USFWS national surveys.

The estimated total number of jobs supported by hunting and fishing is roughly the same in 2007 as in 2002. At the county level, the individual counties with the highest percentage of jobs supported by hunting and fishing are largely the same. Of the ten counties with the highest percentage of jobs supported by hunting and fishing in 2002, nine are also in the top ten in 2007.

Wildlife watching. Exhibit V-4 on the next page compares the economic impact of wildlife watching in 2001 and 2006. After adjusting for inflation, both direct expenditures and the total impact of wildlife watching were greater in 2006 than in 2001. In both years, non-residents spent more money and had a greater economic impact than residents. Wildlife watching supported a similar number of jobs in 2006 and 2001.

Exhibit V-4.
Comparison of Wildlife Watching Expenditures and Impacts, 2001 and 2006

	Direct Expenditures ($ in thousands)		Total Impact[1] ($ in thousands)	
	2001	2006	2001	2006
Resident	$184,700	$285,800	$336,800	$497,900
Non-resident	390,700	417,400	690,800	720,300
Total	**$575,400**	**$703,200**	**$1,027,600**	**$1,218,200**

Note: Measured in 2007 dollars.
1. Direct expenditures plus secondary spending by businesses and households (multiplier effects).
Source: BBC Research & Consulting from 2001 and 2006 USFWS national surveys.

Comparability of models. Slight methodological differences between model years may also contribute to changes in estimates of economic impacts. In addition, BBC model results are primarily based on estimates derived from surveys, including the national U.S. Fish and Wildlife Service survey. Due to this being a nationwide survey, samples sizes specific to Colorado in some categories were small, requiring BBC to use alternative methods for estimating expenditures.

For these reasons, caution should be used when making comparisons between years, particularly for individual categories (such as small game hunting and non-resident activities) where the total number of activity days is small.