

The Economic Impact of Spending for Operations and Construction in 2013 by AZA-Accredited Zoos and Aquariums



By

Stephen S. Fuller, Ph.D.

Dwight Schar Faculty Chair and University Professor

Director, Center for Regional Analysis

George Mason University, Arlington, Virginia

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ECONOMIC IMPACT OF ZOO AND AQUARIUM OPERATIONS AND CONSTRUCTION SPENDING IN 2013

The objective of this research is to calculate the economic impacts of the annual spending of all Association of Zoos and Aquariums (AZA) accredited zoos and aquariums at the state and national levels. The annual operating and capital outlays of zoos and aquariums generate important economic benefits within their respective local and state economies and, in aggregate, generate important economic benefits nationally. These economic impacts include: contributions to the local, state, national and international economies that enlarge their respective values of goods and services they produce (i.e., gross domestic product), new personal earnings (labor income—salaries and wages) that accrue to workers residing in the host jurisdictions, and jobs that are supported across the breadth of the local, state and national economies as the initial direct spending by the zoos and aquariums is re-spent and re-cycled in the form of indirect and induced business activities and payroll disbursements.

In 2013, U.S. AZA-accredited zoos and aquariums spent \$3.8 billion. This spending in 2013 was divided between operating outlays (these recur annually) totaling \$3.2 billion and capital outlays (these vary annually according to construction scheduling) that totaled \$0.6 billion. Excluded from this direct spending are the outlays of concessionaires that independently provide on-site retail and food services. Their operating outlays would add to the total economic impacts of their respective zoos and aquariums.

In addition to this spending by the zoos and aquariums for their annual operations and capital improvements, the visitors to zoos and aquariums represent an important source of economic activity that may accrue to businesses elsewhere in the host jurisdiction. While not all visitors to zoos and aquariums combine their visit with other commercial activities either before or after their visit, research has shown that some do and that this spending can be significant. The number of visitors to AZA-accredited zoos and aquariums in 2013 was 178.1 million globally, while 164.6 million visitors visited an accredited zoo or aquarium in the United States. The off-site before-and-after-visit spending impacts are estimated to total \$2.4 billion.

The economic impacts of this direct spending in 2013 can be highlighted as follows and are shown in the table below:

- the direct outlays by U.S. AZA-accredited zoos and aquariums for operations and construction of \$3.8 billion in 2013 contributed a total of \$10.6 billion to U.S. GDP reflecting an aggregate output multiplier of 2.82;
- this direct spending generated \$3.4 billion in new personal earnings to the benefit of workers residing in the U.S. and supported 103,833 full-time, year-round equivalent jobs across all sectors of the U. S. economy;

- the before-and-after visitor spending, estimated to total \$2.4 billion, added an additional \$6.6 billion to GDP, generated \$2.0 billion in new personal earnings and supported 62,126 full-time, year-round equivalent jobs nationwide; and,
- the total contribution of AZA-accredited zoos and aquariums to the U.S. economy in 2013 was \$17.2 billion, generating personal earnings totaling \$5.4 billion and supporting 165,959 full-time, year-round equivalent jobs.

Five of AZA's ten international member organizations reported direct annual operating of \$292.0 million and nine reported capital outlays totaling \$83.4 million for a combined total of \$375.4 million in annual spending outlays. This spending added an estimated \$856.4 million in aggregate benefits to these organizations' host economies, generated \$266.8 million in new personal earnings for workers residing locally (in addition to direct payroll outlays) and supported 8,741 full-time, year-round equivalent jobs across the breadth of their respective national economies.

Summary of Economic Impacts Generated
By AZA-Accredited Zoos and Aquariums, 2013
(in billions of 2013 dollars)

Sources	Direct Outlays	Total Output ¹	Personal Earnings ²	Jobs Supported ³
Total US	\$6.126	\$17.231	\$5.397	165,959
AZA Members	3.750	10.579	3.432	103,833
Visitors	2.376	6.652	1.965	62,126
International ⁴	\$0.375	\$0.856	\$0.267	8,741
Total Impacts	\$6.501	\$18.087	\$5.664	174,700

Source: Association of Zoos and Aquariums; GMU Center for Regional Analysis.

Notes: ¹the total value of goods and services generated directly and indirectly as a result of annual outlays by zoos and aquariums and their visitors in the US in 2013; ²the additional earnings generated within the U.S.; ³the jobs supported nationwide by the spending and re-spending of direct outlays; ⁴reflects incomplete reports from ten international member zoos and aquariums.

In summary, these analyses have confirmed that the economic impacts of annual spending by AZA's accredited zoos and aquariums and the related before-and-after- visit off-site spending by their visitors have benefits that far exceed their initial annual operating and capital outlays and constitute an important source of new income and jobs that extend broadly across the affected economies as this direct spending is re-cycled and re-spent by businesses and residents in the host jurisdictions.

This report updates similar reports issued in March 2011 and June 2012, with the objective of calculating the economic impacts of the annual spending in 2013 of all Association of Zoos and Aquariums (AZA) accredited zoos and aquariums at the state, national and international levels. The annual operating and capital outlays of zoos and aquariums have been shown to generate important economic benefits within their respective local and state economies and, in aggregate, generate important economic benefits nationally. Not included in these calculations are the outlays of concessionaires that independently provide on-site retail and food services. These operating outlays of concessionaires would further enlarge the total economic impacts of their respective zoos and aquariums. Before-and-after visit spending for goods and services by visitors to zoos and aquariums are an additional source of economic impact on the host jurisdictions and their respective state economies and are estimated herein but may represent significantly larger benefits than shown had more complete visitor data been available.

The total economic impact of the direct spending by AZA-accredited zoos and aquariums is the sum of these direct operating and construction outlays plus their subsequent effects on their host economies as these dollars are re-spent multiple times for the purchases of goods and services provided locally. The aggregate value of this direct and indirect spending by U.S. zoos and aquariums can be calculated by applying appropriate economic multipliers calculated by the U.S. Bureau of Economic Analysis for each state and the nation as a whole. Additionally, the resultant generation of new personal earnings (that is, earnings—wages and salaries—accruing to workers residing within the jurisdiction of analysis) and the number of jobs supported elsewhere within the economy (not necessarily only local jobs) can be calculated by applying the respective state and national multipliers. For international member organizations representative multipliers have been constructed to estimate their economic impacts on their respective jurisdictions where direct spending data area available.

The result of these analyses will be the economic impacts that are generated by one year's spending by AZA's accredited zoos and aquariums. This spending and its cumulative impacts represent the economic impacts generated in 2013. As the operating outlays associated with the zoos and aquariums recur annually, these impacts will continue each year and will likely grow on a case-by-case basis in response to increases in operation outlays as prices rise and services are expanded while construction-related economic impacts are largely confined to the construction period and vary considerably from one year to the next in response to infrastructure modernization requirements and capital expansion plans. The results reported herein for the capital component of spending outlays, inclusive of major repairs or expansion of infrastructure, by zoos and aquariums are illustrative of the magnitude and related significance of construction outlays. These capital outlays represent a different mix of economic activities than is associated with spending for operations with corresponding multipliers reflecting these differences.

This report is divided into four major sections in addition to the executive summary. Following this Introduction, the next section focuses on measuring the economic impacts that result from the direct spending for their annual operations by AZA's accredited zoos and aquariums. The third section of this report presents the economic impacts associated with 2013 capital spending by the AZA's accredited zoos and aquariums. The fourth section—Appendices—presents the state-by-state lists of 2013 spending for operations and capital improvements and the associated multipliers used for calculating their economic impacts. Also included in the Appendices are a description of the methodology and definitions relevant to this research.

The Association of Zoos and Aquariums provided the expenditure data used in this analysis from its 2013 annual member survey. The operating and capital spending data were reported by each member organization and aggregated to the state level and nationally for use in this analysis. Where operating budget data were missing, these outlays were estimated based on average per visitor spending data for the member institutions that did report their 2013 operating expenditures. Before-and-after visit spending has been estimated from selective individual member studies from previous years adjusted for inflation with spending values calculated on a per visitor basis and applied to the full visitor count report by the AZA members in their annual survey.

PROFILE OF ZOOS AND AQUARIUMS

A 2013 survey conducted by the Association of Zoos and Aquariums (AZA) of its 233 accredited members establishes the broad dimensions of their economic importance as a source of local and national business activity. As summarized in Table 1, this survey found that AZA-accredited zoos and aquariums had 178.1 million visitors in 2013. These organizations reported operating outlays totaling \$3.5 billion, capital outlays of \$641.7 million and a total work force of 42,471 of which 27,357 or 64.4 percent were full-time.

TABLE 1

Direct Economic Impacts of AZA-Accredited Zoos and Aquariums, 2013 (in billions of 2013 dollars)				
AZA Members	Operations ¹	Capital Outlays ¹	Employees ^{1,2}	Attendance
United States	\$3.192	\$0.558	38,078	164,626,321
Outside U.S.	0.292	0.084	4,393	13,441,116
Total	\$3.484	\$0.642	42,471	178,067,437

Source: Source: Association of Zoos and Aquariums, 2014
¹based on reporting AZA-accredited members; ²full- and part-time.

ECONOMIC IMPACTS OF DIRECT SPENDING BY ZOOS AND AQUARIUMS

Two primary categories of outlays are reflected in this analysis: annual operating outlays made by the member zoos and aquariums during 2013 and capital outlays involving the construction of infrastructure and facilities contracted in 2013. The former recur annually and likely will increase annually for individual members to reflect changes in their costs and the services they provide while capital expenditures are one-time outlays and recur on an as needed basis. When combined for 2013, these total economic impacts establish the full magnitude of economic benefits that flow directly from AZA-accredited zoos and aquariums to the benefit of their respect state and national economies.

SPENDING BY AZA-ACCREDITED ZOOS AND AQUARIUMS IN THE U.S.

The findings of this economic impact analysis are presented in Table 2 for the AZA-accredited zoos and aquariums located in the United States.

TABLE 2

Total Economic Impacts of U. S. AZA-Accredited Zoos and Aquariums, 2013 (in billions of 2013 dollars)				
Sources	Direct Outlays*	Total Output ¹	Personal Earnings ²	Jobs Supported ³
Operating Outlays	\$3.192	\$8.866	\$2.888	90,798
Zoos	2.098	5.828	1.898	59,684
Aquariums	1.094	3.038	0.990	31,114
Capital Outlays	0.558	1.713	0.544	13,035
Zoos	0.430	1.321	0.419	10,052
Aquariums	0.128	0.392	0.125	2,983
Total Outlays	\$3.750	\$10.579	\$3.432	103,833

Sources: Association of Zoos and Aquariums, GMU Center for Regional Analysis. *Direct outlays from Table 1. Notes: ¹the total value of goods and services generated directly and indirectly as a result of annual operating and capital outlays by AZA-accredited zoos and aquariums in the U.S. in 2013; ²the additional earnings generated within the U.S. from outlays for AZA-accredited zoos and aquariums in 2013 for operations and capital projects; ³the jobs supported locally and elsewhere by the spending and re-spending of outlays associated with the operation and capital outlays of AZA-accredited zoos and aquariums in 2013.

Total direct spending by AZA-accredited zoos and aquariums in the United States, for both operations and capital improvements in 2013, totaled \$3.8 billion. These direct outlays contributed a total of \$10.6 billion to the national economy (gross domestic product) reflecting a combined multiplier (operating outlays and capital—construction—outlays) of 2.82. That is, for each dollar (\$1.00) of outlays by AZA's U.S. member organizations in 2013, an additional \$1.82 was generated to the benefit of the U.S. economy for a total economic impact of \$2.82.

This direct spending by AZA's U.S. accredited zoos and aquariums also generated new wages and salaries earned by workers across the breadth of the U.S. economy and supported jobs beyond those of the member organizations. In 2013, the direct and indirect spending impacts of the zoos and aquariums covered by the AZA survey generated new personal earnings of U.S. resident workers totaling \$3.4 billion and supported the full-time equivalent of 103,833 full-time, year-round equivalent jobs nationwide across all sectors.

The distribution of these economic benefits across each the host states of AZA-accredited zoos and aquariums reflect the scale of their local annual operating outlays and capital budget as well as the size and complexity of the respective state's economy. When all of the individual state-level impacts are summed, their combined impacts account for approximately 75 percent of the national economic benefit reflecting an aggregate state-level multiplier of 2.11—each \$1 of direct spending generates an additional \$1.11 in indirect and induced output in the host state's economy exclusive of interstate spillover effects—as shown in Table 3 below.

TABLE 3

Total State, Interstate and National Economic Impacts of U.S. AZA-Accredited Zoos and Aquariums, 2013 (in billions of 2013 dollars)				
Sources	Direct Outlays*	Total Output ¹	Personal Earnings ²	Jobs Supported ⁵
All States	\$3.750	\$7.898	\$2.555	81,047
Interstate		2.681	.877	22,786
Total US	\$3.750	\$10.579	\$3.432	103,833

Source: GMU Center for Regional Analysis. See Appendix C for state-level economic impacts for AZA-accredited zoos and aquariums.
*For definition of headings, see Table 2.

The economic benefits that cannot be assigned to any specific state—interstate spillovers—account for economic benefits that involve: (1) transportation effects resulting from the purchases of goods supplied by out-of-state vendors, (2) instances where employees reside in a state different from that in which they work (cross-state commuting), and (3) interstate visitor travel patterns. While the economic impacts that accrue locally do reflect significant benefits beyond the direct outlays for the operation and capital improvement of local zoos and aquariums, these local outlays also have extra-state benefits that can be calculated at the national level that significantly enlarge the magnitudes of benefits flowing from these facilities.

ECONOMIC IMPACTS OF BEFORE-AND-AFTER-VISIT SPENDING

Spending by visitors to zoos and aquariums either before and after their visits (excluding all on-site spending) have been found to generate significant retail and other consumer services sales including retail sales, food services, accommodations and transportation to the benefit of the host jurisdictions. This spending is the greatest for out-of-town overnight visitors and out-of-town day-trippers. Research undertaken as part of an economic impact study of the Maryland Zoo in Baltimore (1996) found that on average, in 2013 dollar equivalents, the average outlay per visit when spread out across all visitors (the total before-and-after visitor spending divided by total visitation) was \$14.43.

If all visitors to AZA member zoos and aquariums reflected this level of before-and-after visit spending, total spending associated with all visitors to AZA's U.S. member zoos or aquariums would have generated \$2.38 billion in 2013 to the benefit of their host economies. This spending largely benefits retail and consumer services and the hospitality sector (including lodgings, restaurants and food services). As these sectors are relatively labor intensive and have a moderate wage and salary structure, the economic impacts of these spending are concentrated within local economies. With a multiplier of 2.8, the contribution of this spending to GDP in 2013 would have totaled \$6.65 billion and it would have generated a total of \$2.0 billion in new personal earnings and supported 62,126 full-time, year-round equivalent jobs locally and elsewhere in the U.S. economy.

THE ECONOMIC IMPACT OF SPENDING BY INTERNATIONAL MEMBER ZOOS AND AQUARIUMS

The Association of Zoos and Aquariums has ten international member organizations with nine of these responding to its survey on 2013 spending: five for operations and nine for capital outlays. The annual spending of these organizations impacts their attendant economies similarly to the impacts reported above for U.S. zoos and aquariums. As the relevant multipliers for these international locations are not available, estimates of the total economic impact, generation of personal earnings and support of employment have been calculated by borrowing and combining U.S. state-level multipliers that closely mirror the size and complexity of the host economies of the respective international zoos and aquariums.

This approach will not result in as precise an analysis as would have been achieved if the local multipliers had been available for the international jurisdictions. However, in the absence of locally specific internationally multipliers, this substitute approach will establish an order-of-magnitude measure of related economic impacts that result annually from the direct operating outlays and capital spending in 2013 of AZA-accredited zoos and aquariums located outside of the United States.

As reported in Table 1, the direct spending of AZA's international member zoos and aquariums responding to the survey totaled \$292.0 million for operations in 2013 with an additional spending of \$83.4 million for capital projects. The total direct spending, as reported, of AZA's international members for operations and capital projects in 2013 was \$375.4 million. It is estimated that this direct spending resulted in a total contribution to these organizations' respective economies of \$856.4 million, reflecting an estimated aggregate multiplier of 2.28. Additionally, this direct spending generated an estimated increase of \$266.8 million in new personal earnings for residents of these institutions' host jurisdictions beyond their direct payroll outlays. Additionally, this spending and the re-spending of these outlays within the local and national economies supported an estimated 8,741 full-time, year-round equivalent jobs.

As was the case for their U.S. counterparts, the presence of on-site concessionaires will generate additional direct operating outlays (payroll and non-payroll) that would support and generate direct and indirect employment and personal income to the benefit of their host economies. Beyond these on-site outlays that generate off-site economic impacts, visitors to these zoos and aquariums may also take part in before-and-after visit activities that include out-of-town visitors staying in the area and spending additional money at retail outlets, hotels, restaurants, and other local attractions. No attempt has been made to estimate the magnitude of this related spending on the local economies of the jurisdictions where the AZA international member zoos and aquariums are located.

TABLE 4

Total Economic Impacts of AZA's International Member Zoos and Aquariums, 2013 (in millions of 2013 dollars)				
Sources	Direct Outlays*	Total Output ¹	Personal Earnings ²	Jobs Supported ³
Operating Outlays	\$291.986	\$656.18	\$206.643	7,055
Capital Outlays	83.397	200.24	60.163	1,686
Total US	\$375.383	\$856.42	\$266.806	8,741

Sources: Association of Zoos and Aquariums, GMU Center for Regional Analysis.
*For definition of headings, see Table 2.

SUMMARY OF ECONOMIC IMPACTS

Annual spending by zoos and aquariums for operations and capital projects generate significant economic benefits for their host jurisdictions. These benefits build from the initial annual outlays for operations and capital improvements, as these outlays are re-spent across the breadth of the local economies. These benefits accumulate and expand these economies' total output as measured by their contributions to Gross Domestic Product and respective Gross State Products. These benefits also generate new personal earnings—labor income—to the benefit of workers residing in the host jurisdictions and support job growth locally, regionally and nationally.

The \$6.1 billion in total direct outlays by AZA's U.S. member zoos and aquariums and their visitors within their host economies in 2013 generated \$17.2 billion in total economic impact; that is, each \$1 of direct spending by zoos and aquariums and their visitors within their local economies generated \$2.81 of total benefits on average to the U.S. economy and \$2.38 on average to the benefit of the economies of their host jurisdictions. This direct spending of \$6.95 billion also generated \$5.4 billion in new personal earnings to the benefit of U.S. resident workers as a result of the re-spending of payroll and business income by employees and vendors of the zoos and aquariums and the subsequent re-spending of these monies within the local economies. This economic activity—direct outlays, indirect impacts and induced effects—also supported 165,959 full-time, year-round equivalent jobs throughout the local, state and national economies beyond the direct job base supported by the zoos and aquariums. These economic impacts are summarized in Table 5.

TABLE 5

Summary of Economic Impacts Generated By AZA-Accredited Zoos and Aquariums, 2013 (in billions of 2013 dollars)				
Sources	Direct Outlays*	Total Output ¹	Personal Earnings ²	Jobs Supported ³
Total US	\$6.126	\$17.231	\$5.397	165,959
AZA Members	3.750	10.579	3.432	103,833
Zoos	2.529	7.149	2.318	69,737
Aquariums	1.221	3.430	1.114	34,096
Visitors-Offsite	2.376	6.652	1.965	62,126
International	0.375	0.856	0.267	8,741
Total Impacts	\$6.501	\$18.087	\$5.664	174,700

Source: GMU Center for Regional Analysis.
For definition of headings, see Table 2.

APPENDIX A

DIRECT SPENDING BY U.S. AZA MEMBER ZOOS AND AQUARIUMS, 2013 (DOLLARS IN MILLIONS)

State	Total Budget	Operation Cost	Construction Cost
Alaska	9.7	9.2	0.5
Alabama	9.6	9.3	0.3
Arkansas	7.7	6.5	1.2
Arizona	41.9	31.3	10.6
California	627.3	592.4	34.9
Colorado	64.1	56.6	7.4
Connecticut	35.7	32.0	3.6
District of Columbia	74.1	52.5	21.6
Delaware	1.0	1.0	-
Florida	701.0	675.0	26.0
Georgia	114.7	99.6	15.2
Hawaii	5.9	5.4	0.5
Iowa	10.8	6.3	4.6
Idaho	3.7	3.6	0.1
Illinois	172.5	152.4	20.1
Indiana	46.3	42.9	3.4
Kansas	23.3	19.6	3.8
Kentucky	28.3	25.4	2.9
Louisiana	55.1	47.9	7.2
Massachusetts	68.4	61.8	6.6
Maryland	72.7	49.2	23.5
Maine	-	-	-
Michigan	56.9	50.2	6.8
Minnesota	38.3	33.6	4.8
Missouri	124.4	93.6	30.9
Mississippi	2.2	2.2	-

Source: AZA, GMU Center for Regional Analysis

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APPENDIX A

DIRECT SPENDING BY U.S. AZA MEMBER ZOOS AND AQUARIUMS, 2013 (DOLLARS IN MILLIONS)

State	Total Budget	Operation Cost	Construction Cost
Montana	1.6	1.4	0.2
North Carolina	52.5	33.2	19.3
North Dakota	5.9	3.9	2.0
Nebraska	48.1	35.1	13.0
New Hampshire	1.4	1.4	0.0
New Jersey	28.2	21.7	6.5
New Mexico	18.6	13.0	5.6
Nevada	15.8	15.5	0.3
New York	210.7	129.6	81.1
Ohio	184.6	146.1	38.5
Oklahoma	30.4	25.9	4.6
Oregon	54.9	40.2	14.7
Pennsylvania	111.2	72.8	38.4
Rhode Island	10.4	9.9	0.5
South Carolina	47.8	46.1	1.7
South Dakota	10.1	4.8	5.2
Tennessee	69.9	61.0	8.9
Texas	250.4	226.6	23.8
Utah	36.6	20.3	16.3
Virginia	31.2	22.5	8.7
Vermont	-	-	-
Washington	95.5	67.8	27.7
Wisconsin	37.8	33.1	4.7
West Virginia	0.9	0.9	-
Wyoming	-	-	-
STATE TOTALS	\$3,750.40	\$3,192.1	\$558.3

APPENDIX B

ECONOMIC IMPACTS OF OPERATIONS
OUTLAYS BY U.S. AZA MEMBER ZOOS AND
AQUARIUMS, 2013 (DOLLARS IN MILLIONS)

State	Operation Cost	Total Output	Personal Earnings	Jobs Supported
Alaska	9.2	15.9	4.7	177
Alabama	9.3	16.7	5.3	254
Arkansas	6.5	10.8	3.4	168
Arizona	31.3	62.6	20.3	666
California	592.4	1279.0	392.0	10,866
Colorado	56.6	128.8	44.6	1,585
Connecticut	32.0	62.5	18.1	820
District of Columbia	52.5	76.9	8.5	276
Delaware	1.0	1.8	0.5	15
Florida	675.0	1437.4	492.4	14,937
Georgia	99.6	224.5	69.7	2,210
Hawaii	5.4	10.3	3.2	145
Iowa	6.3	10.2	3.1	158
Idaho	3.6	5.9	1.9	91
Illinois	152.4	344.6	116.8	4,032
Indiana	42.9	85.7	30.3	1,210
Kansas	19.6	32.9	9.4	358
Kentucky	25.4	47.9	14.6	664
Louisiana	47.9	92.4	32.4	1,053
Massachusetts	61.8	130.7	43.2	1,433
Maryland	49.2	100.5	33.0	1,185
Maine	-	-	-	-
Michigan	50.2	102.6	36.7	1,292
Minnesota	33.6	71.8	25.3	882
Missouri	93.6	199.1	62.9	2,135
Mississippi	2.2	3.5	1.0	40

Source: AZA, GMU Center for Regional Analysis

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APPENDIX B

**ECONOMIC IMPACTS OF OPERATIONS
OUTLAYS BY U.S. AZA MEMBER ZOOS AND
AQUARIUMS, 2013 (DOLLARS IN MILLIONS)**

State	Operation Cost	Total Output	Personal Earnings	Jobs Supported
Montana	1.4	2.3	0.8	28
North Carolina	33.2	69.6	24.9	954
North Dakota	3.9	6.0	1.7	62
Nebraska	35.1	56.9	17.1	740
New Hampshire	1.4	2.6	0.8	33
New Jersey	21.7	48.9	15.1	466
New Mexico	13.0	22.4	7.1	271
Nevada	15.5	29.8	10.0	401
New York	129.6	272.1	77.4	2,309
Ohio	146.1	314.8	102.3	3,659
Oklahoma	25.9	50.4	18.4	811
Oregon	40.2	78.8	26.3	1,024
Pennsylvania	72.8	156.7	51.6	1,661
Rhode Island	9.9	18.3	5.5	322
South Carolina	46.1	86.6	27.1	1,369
South Dakota	4.8	7.3	2.1	78
Tennessee	61.0	134.9	46.1	1,494
Texas	226.6	513.2	164.4	5,587
Utah	20.3	45.2	15.0	635
Virginia	22.5	45.0	13.9	546
Vermont	-	-	-	-
Washington	67.8	136.5	45.7	1,908
Wisconsin	33.1	66.0	23.5	800
West Virginia	0.9	1.5	0.4	18
Wyoming	-	-	-	-
STATE TOTALS	\$3,192.1	\$6,720.7	\$2,170.2	71,828
INTERSTATE SPILLOVERS	-	\$2,144.9	\$718.0	18,969
GRAND TOTAL	\$3,192.1	\$8,865.5	\$2,888.3	90,798

APPENDIX C

**ECONOMIC IMPACTS OF CONSTRUCTION
OUTLAYS BY U.S. AZA MEMBER ZOOS AND
AQUARIUMS, 2013 (DOLLARS IN MILLIONS)**

State	Operation Cost	Total Output	Personal Earnings	Jobs Supported
Alaska	0.5	0.9	0.3	7
Alabama	0.3	0.7	0.2	6
Arkansas	1.2	2.4	0.8	22
Arizona	10.6	22.2	7.8	192
California	34.9	80.0	27.5	585
Colorado	7.4	16.9	5.8	140
Connecticut	3.6	7.1	2.4	51
District of Columbia	21.6	26.0	2.0	38
Delaware	-	-	-	-
Florida	26.0	54.3	19.3	521
Georgia	15.2	34.3	11.5	303
Hawaii	0.5	1.0	0.3	8
Iowa	4.6	8.2	2.8	74
Idaho	0.1	0.2	0.1	2
Illinois	20.1	47.6	15.6	343
Indiana	3.4	7.4	2.4	62
Kansas	3.8	7.3	2.2	57
Kentucky	2.9	6.1	1.9	53
Louisiana	7.2	15.1	5.1	125
Massachusetts	6.6	13.5	4.5	95
Maryland	23.5	46.3	15.1	329
Maine	-	-	-	-
Michigan	6.8	14.7	5.1	138
Minnesota	4.8	10.3	3.4	85
Missouri	30.9	68.0	21.3	538
Mississippi	-	-	-	-

Source: AZA, GMU Center for Regional Analysis

(APPENDIX C CONTINUED ON NEXT PAGE)

APPENDIX C

ECONOMIC IMPACTS OF CONSTRUCTION OUTLAYS BY U.S. AZA MEMBER ZOOS AND AQUARIUMS, 2013 (DOLLARS IN MILLIONS)

State	Operation Cost	Total Output	Personal Earnings	Jobs Supported
Montana	0.2	0.3	0.1	3
North Carolina	19.3	42.2	14.2	391
North Dakota	2.0	3.6	1.2	30
Nebraska	13.0	22.4	7.6	194
New Hampshire	0.0	0.1	0.0	0
New Jersey	6.5	14.3	4.6	97
New Mexico	5.6	10.6	3.6	99
Nevada	0.3	0.6	0.2	5
New York	81.1	153.3	50.3	1,065
Ohio	38.5	89.8	29.5	758
Oklahoma	4.6	9.8	3.3	91
Oregon	14.7	30.5	10.1	256
Pennsylvania	38.4	91.1	29.6	688
Rhode Island	0.5	0.9	0.3	7
South Carolina	1.7	3.7	1.3	35
South Dakota	5.2	8.9	3.1	85
Tennessee	8.9	20.1	6.5	166
Texas	23.8	59.4	19.9	455
Utah	16.3	38.1	12.9	334
Virginia	8.7	17.9	5.8	143
Vermont	-	-	-	-
Washington	27.7	59.9	20.3	453
Wisconsin	4.7	9.8	3.4	86
West Virginia	-	-	-	-
Wyoming	-	-	-	-
STATE TOTALS	\$558.3	\$1,177.5	\$385.2	9,218
INTERSTATE SPILLOVERS	-	\$535.8	\$158.5	3,817
GRAND TOTAL	\$558.3	\$1,713.3	\$543.7	13,035

APPENDIX D

TOTAL ECONOMIC IMPACTS OF OUTLAY BY
U.S. AZA MEMBER ZOOS AND AQUARIUMS,
2013 (DOLLARS IN MILLIONS)

State	Operation Cost	Total Output	Personal Earnings	Jobs Supported
Alaska	9.7	16.8	5.0	184
Alabama	9.6	17.4	5.6	260
Arkansas	7.7	13.3	4.1	190
Arizona	41.9	84.8	28.1	858
California	627.3	1,359.0	419.5	11,451
Colorado	64.1	145.7	50.4	1,725
Connecticut	35.7	69.6	20.5	870
District of Columbia	74.1	102.8	10.5	315
Delaware	1.0	1.8	0.5	15
Florida	701.0	1,491.7	511.7	15,459
Georgia	114.7	258.8	81.2	2,514
Hawaii	5.9	11.2	3.5	153
Iowa	10.8	18.4	5.9	233
Idaho	3.7	6.0	2.0	93
Illinois	172.5	392.2	132.4	4,375
Indiana	46.3	93.1	32.7	1,272
Kansas	23.3	40.2	11.6	415
Kentucky	28.3	53.9	16.5	716
Louisiana	55.1	107.5	37.6	1,179
Massachusetts	68.4	144.2	47.7	1,528
Maryland	72.7	146.8	48.0	1,513
Maine	-	-	-	-
Michigan	56.9	117.3	41.8	1,430
Minnesota	38.3	82.1	28.7	967
Missouri	124.4	267.0	84.3	2,673
Mississippi	2.2	3.5	1.0	40

Source: AZA, GMU Center for Regional Analysis

(APPENDIX D CONTINUED ON NEXT PAGE)

APPENDIX D

**TOTAL ECONOMIC IMPACTS OF OUTLAY BY
U.S. AZA MEMBER ZOOS AND AQUARIUMS,
2013 (DOLLARS IN MILLIONS)**

State	Operation Cost	Total Output	Personal Earnings	Jobs Supported
Montana	1.6	2.6	0.9	31
North Carolina	52.5	111.8	39.1	1,345
North Dakota	5.9	9.6	2.8	92
Nebraska	48.1	79.3	24.7	934
New Hampshire	1.4	2.6	0.8	33
New Jersey	28.2	63.2	19.7	564
New Mexico	18.6	33.0	10.7	370
Nevada	15.8	30.4	10.2	405
New York	210.7	425.4	127.7	3,374
Ohio	184.6	404.6	131.8	4,416
Oklahoma	30.4	60.2	21.7	902
Oregon	54.9	109.3	36.4	1,281
Pennsylvania	111.2	247.8	81.2	2,349
Rhode Island	10.4	19.3	5.8	329
South Carolina	47.8	90.4	28.3	1,404
South Dakota	10.1	16.2	5.1	163
Tennessee	69.9	154.9	52.5	1,660
Texas	250.4	572.6	184.2	6,042
Utah	36.6	83.3	27.9	969
Virginia	31.2	62.9	19.7	689
Vermont	-	-	-	-
Washington	95.5	196.3	66.0	2,361
Wisconsin	37.8	75.8	26.9	885
West Virginia	0.9	1.5	0.4	18
Wyoming	-	-	-	-
STATE TOTALS	\$3,750.4	\$7,898.2	\$2,555.4	81,047
INTERSTATE SPILLOVERS	-	\$2,680.6	\$876.6	22,786
GRAND TOTAL	\$3,750.4	\$10,578.8	\$3,432.0	103,833

APPENDIX E

OUTPUT, EARNINGS, AND EMPLOYMENT
MULTIPLIERS: OPERATIONS

State	Total Budget	Operation Cost	Construction Cost
Alaska	1.7384	0.5147	19.332
Alabama	1.7967	0.5737	27.2721
Arkansas	1.6692	0.5165	25.8221
Arizona	2.0004	0.6467	21.2697
California	2.159	0.6618	18.3422
Colorado	2.2745	0.7879	27.9925
Connecticut	1.9502	0.566	25.5871
District of Columbia	1.4641	0.1623	5.2622
Delaware	1.8295	0.5282	15.8393
Florida	2.1294	0.7294	22.1282
Georgia	2.2543	0.6996	22.1967
Hawaii	1.9125	0.5914	27.0249
Iowa	1.629	0.5032	25.3522
Idaho	1.6173	0.5347	25.1748
Illinois	2.2616	0.7666	26.4618
Indiana	1.9986	0.7064	28.2299
Kansas	1.6834	0.4789	18.286
Kentucky	1.8838	0.5732	26.0986
Louisiana	1.9289	0.6774	21.9962
Massachusetts	2.1136	0.6988	23.1815
Maryland	2.0424	0.6696	24.07
Maine	1.8286	0.6007	26.3239
Michigan	2.0453	0.7304	25.7456
Minnesota	2.1392	0.7535	26.2829
Missouri	2.1275	0.6726	22.8171
Mississippi	1.6316	0.4626	18.42

Source: U.S. Bureau of Economic Analysis, 2014

(APPENDIX E CONTINUED ON NEXT PAGE)

APPENDIX E

OUTPUT, EARNINGS, AND EMPLOYMENT
MULTIPLIERS: OPERATIONS

State	Total Budget	Operation Cost	Construction Cost
Montana	1.6353	0.5278	19.3819
North Carolina	2.0972	0.7491	28.7605
North Dakota	1.5439	0.4278	16.1707
Nebraska	1.621	0.4863	21.0919
New Hampshire	1.83	0.5598	23.3295
New Jersey	2.2516	0.6936	21.4479
New Mexico	1.7237	0.5449	20.8064
Nevada	1.924	0.6443	25.853
New York	2.0994	0.5975	17.8137
Ohio	2.155	0.7003	25.0478
Oklahoma	1.9483	0.7094	31.3511
Oregon	1.9603	0.6554	25.4878
Pennsylvania	2.1534	0.7087	22.8224
Rhode Island	1.8504	0.5587	32.5064
South Carolina	1.8787	0.5869	29.7009
South Dakota	1.507	0.4282	16.0325
Tennessee	2.2096	0.755	24.4857
Texas	2.2653	0.7255	24.6611
Utah	2.2246	0.7394	31.2777
Virginia	1.9991	0.6175	24.2725
Vermont	1.7008	0.5021	22.0225
Washington	2.012	0.6738	28.1191
Wisconsin	1.9931	0.7106	24.1439
West Virginia	1.5909	0.4426	19.5977
Wyoming	1.4965	0.4307	13.2712
US	2.7773	0.9048	28.4441

APPENDIX F

OUTPUT, EARNINGS, AND EMPLOYMENT
MULTIPLIERS: CONSTRUCTION

State	Total Budget	Operation Cost	Construction Cost
Alaska	1.8233	0.6304	13.8568
Alabama	2.1497	0.7259	19.5051
Arkansas	1.9602	0.6425	18.0346
Arizona	2.0861	0.739	18.0662
California	2.2895	0.7858	16.7569
Colorado	2.2683	0.7826	18.8544
Connecticut	1.9558	0.6567	13.9706
District of Columbia	1.2023	0.0906	1.7804
Delaware	1.8839	0.5373	13.0196
Florida	2.0909	0.7436	20.0685
Georgia	2.2633	0.7623	20.0285
Hawaii	1.9298	0.6843	15.6851
Iowa	1.8018	0.6056	16.3436
Idaho	1.8088	0.6387	18.2189
Illinois	2.369	0.776	17.062
Indiana	2.1798	0.71	18.3468
Kansas	1.9332	0.5935	15.1935
Kentucky	2.1213	0.6649	18.4821
Louisiana	2.093	0.7121	17.3469
Massachusetts	2.043	0.6781	14.3615
Maryland	1.9716	0.641	13.9927
Maine	1.9845	0.7003	19.6496
Michigan	2.1682	0.7544	20.4644
Minnesota	2.1572	0.7191	17.8845
Missouri	2.2024	0.6918	17.4321
Mississippi	2.0237	0.6612	18.638

Source: U.S. Bureau of Economic Analysis, 2014

(APPENDIX F CONTINUED ON NEXT PAGE)

APPENDIX F

OUTPUT, EARNINGS, AND EMPLOYMENT
MULTIPLIERS: CONSTRUCTION

State	Total Budget	Operation Cost	Construction Cost
Montana	1.8796	0.6591	18.9537
North Carolina	2.1852	0.7357	20.1983
North Dakota	1.7667	0.564	14.462
Nebraska	1.7156	0.5819	14.86
New Hampshire	2.0629	0.6668	16.2221
New Jersey	2.1999	0.7058	14.9839
New Mexico	1.8956	0.6547	17.7908
Nevada	1.8886	0.6661	15.3689
New York	1.8908	0.6201	13.1364
Ohio	2.3325	0.7667	19.6846
Oklahoma	2.1421	0.7251	19.9859
Oregon	2.0724	0.6839	17.403
Pennsylvania	2.369	0.77	17.8969
Rhode Island	1.8886	0.5965	14.5946
South Carolina	2.1765	0.7279	20.4522
South Dakota	1.6919	0.5875	16.2962
Tennessee	2.2647	0.7304	18.6808
Texas	2.4924	0.8332	19.089
Utah	2.3414	0.7935	20.5042
Virginia	2.0488	0.6628	16.3838
Vermont	1.8622	0.6343	17.7543
Washington	2.1603	0.7331	16.364
Wisconsin	2.0866	0.713	18.153
West Virginia	1.8757	0.5995	15.8972
Wyoming	1.7276	0.5893	14.1577
US	3.0688	0.9739	23.3487

The total impacts of the Association of Zoos and Aquarium (AZA) accredited zoos and aquariums on their respective states and countries reflect the combination of direct outlays (capital or operating) and their subsequent monetary effects as these funds are circulated through the economy; that is, the re-spending of these direct outlays will generate additional economic activity that otherwise would not have occurred. The total value of these combined direct and indirect values can be estimated by the application of appropriate multipliers that have been calculated for each state and for the U.S. in aggregate by the Bureau of Economic Analysis of the U.S. Department of Commerce employing its Regional Input-Output Model (RIMS II). For foreign member zoos and aquariums, composite multipliers have been constructed reflect similar size and complexities of economies in the U.S. in order to estimate likely impacts on their respective economies.

The results of these calculations are estimates for: (1) output value—total contribution to the local and regional economy; (2) personal earnings—new earnings realized by residents of the state or nation in which respective member spending occurs; and (3) the jobs supported by these outlays—full-time, year-round equivalent jobs throughout the state and nation.

The key variables governing the magnitude and significance of these economic impacts are their dollar value, the category of outlay (e.g., infrastructure and capital construction, and zoo and aquarium operations), the direct employment and payroll associated with the direct spending by member zoos and aquariums, and the geographic area of analysis and the complexity of the state economies. The size and complexity of the state and national economies determine the extent to which the local economies can provide the inputs (goods and services purchased by member zoos and aquariums and its employees as they spend their wages) and retain the monetary benefits of these economic activities; i.e., how self-sufficient these economies are.

The state-by-state listings of operations and construction multipliers are included in the Appendices E and F.

APPENDIX H | DEFINITIONS

Direct Outlays—all annual spending associated with the operations and construction (capital infrastructure) by AZA member zoos and aquariums.

Capital Outlays—expenditures by AZA member zoos and aquariums for new construction and infrastructure reported by the year in which the expenditure is reported even if the capital project may not have been completed in that year or annualized where possible.

Economic Impact—the generation of new spending (\$s) within a jurisdiction as a result operating outlays or outlays for capital projects of AZA members.

Gross State Product (GSP) and Gross Domestic Product (GDP)—the value of goods and services produced within the economy of the designated geographic area (state, nation).

Indirect Benefit—the additional economic benefits—measured in dollars or jobs—resulting from the accumulated additional value generated by the direct outlays or expenditures, as these dollars are re-spent within the economy. Indirect effects are calculated using multipliers and include sales and purchases by businesses supplying goods and services in support of the activities of AZA member zoos and aquariums as well as the re-spending of payroll by employees of these organizations and the workers of its vendors.

Multiplier—a numerical factor that captures the total value of a direct outlay of or benefits produced by the outlays made by AZA member zoos and aquariums on the economy as these funds are re-spent within that economy; an output multiplier measures the contribution (impact) of a direct outlay on the overall economy, an employment multiplier measures the total number of jobs that can be supported by a direct outlay; and a personal earnings multiplier measures the total personal earnings (wages and salaries) generated within the jurisdiction as a result of a zoo's or aquarium's direct outlay and the jobs its supports.

Operating Costs—Costs (expenditures) associated with the day-to-day operation of AZA member zoos and aquariums including management, utilities, normal maintenance and repair, custodial services, security, staffing, animal care and feeding, and purchases of supplies and equipment where these outlays are direct or for contractors (vendors and suppliers) but exclude outlays by concessionaires for their on-site operations.

Spillover Benefits—economic impacts generated by direct outlays in a host state that are realized in another state due to employees commuting across state lines, visitation by out-of-state travelers, and indirect impacts of spending by out-of-state suppliers including interstate transportation costs.

Total Output—the sum of the direct and indirect impacts (outlays) reflecting the combination of the initial expenditures and their subsequent accumulated value as it is cycled through the economy inclusive of benefits generated by the re-spending of personal earnings; contribution to GDP (gross domestic product) and GSP (gross state product) or GCP.