The Economics Associated with Outdoor Recreation, Natural Resources Conservation and Historic Preservation in the United States

For:
The National Fish and Wildlife Foundation

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Summary Findings

Outdoor recreation, natural resources conservation and historic preservation in the United States all have measurable economic impacts. Some selected facts from the following report are highlighted here. These are illustrative of the entire picture that can be developed following a close study of the economics of these sectors at the national level. All dollar figures are reported in 2011 dollars, except as noted.

Combined Value of Outdoor Recreation, Nature Conservation and Historic Preservation

Values for jobs, tax revenues and other economic impacts are reported in this review for numerous forms of outdoor recreation, conservation and historic preservation activities. Due to limited data, it was not possible to account for all economic contributions from these activities. An accounting is presented here of the known activities presented in this report, which can be considered a minimum estimate:

Jobs = 9.4 million
Federal, state and local tax revenues = $107 billion
Total economic activity (equivalent to GDP) = $1.06 trillion.

Outdoor Recreation

- In 2006, the total contribution from outdoor recreation in the United States was over $730 billion a year, generates 6,435,000 U.S. jobs and $88 billion in federal and state tax revenues. This includes hunting, fishing, wildlife viewing and the "human-powered" recreations such as hiking, camping, skiing, paddle sports and bicycling.

- In 2008, 28.3% of U.S. adults went boating at least once. Recreational marine manufacturers employed more than 135,900 people and retail boating/service businesses employed another 217,718 people.

- Other motorized recreation, such as motorcycles, off-road vehicles, and snowmobiles are not included in the estimates presented above but would push the totals to larger levels.

- The combined spending effect of hunting, fishing and wildlife watching associated with National Forest Service land totaled $9.5 billion in annual retail sales, supported 189,400 jobs and provided $1.01 billion in annual federal tax revenues.

- Visitors to Army Corp of Engineers land generated $34.0 billion in sales, contributing $17.1 billion in direct income, and supported 420,000 jobs at the national level in 1996.

- Outdoor recreation sales (gear and trips combined) of $325 billion per year are greater than annual returns from pharmaceutical and medicine manufacturing ($162 billion), legal services ($253 billion), and power generation and supply ($283 billion).

Natural Resources Conservation

- The total value of ecosystem services provided by the acreage of natural habitats in National Wildlife Refuges in the United States totaled $32.3 billion/year, or $2,900 thousand/acre/year.

- The value of ecosystem services provided by natural habitat in the 48 contiguous United States amount to about $1.6 trillion annually, which is equivalent to more than 10% of the U.S. GDP.

- The loss of about 9.9 million acres of wetlands in the U.S. since the 1950s has resulted in an economic loss of more than $81 billion in all wetlands-related ecosystem services.

- Visitors to Army Corp of Engineers land generated $34.0 billion in sales, contributing $17.1 billion in direct income, and supported 420,000 jobs at the national level in 1996.

- Home owners near parks and protected areas are repeatedly seen to have property values more than 20% higher than similar properties elsewhere.

Historic Preservation

- Nationally, the federal tax credits returned more than $22.3 billion in federal tax dollars since 1978 on $17.5 billion in tax credits – a return of 27.4% from every dollar invested.

- Economic activity resulting from federal historic preservation tax credits supports 61,200 jobs, $6.6 billion in economic activity and generated $935 million in tax revenues.

- On the statewide level, Philadelphia historic rehabilitation efforts resulted in average annual impacts of $1.1 billion in total expenditures that supported 9,560 jobs and $353 million in earnings within the state of Pennsylvania. Tax revenues

from this work included $6.6 million local taxes for the city and an additional $24.3 million in tax revenues for the state.

- In Texas in 1997, rehabilitation efforts created more than 4,200 jobs and overall historic preservation activities created more than 40,000 jobs in the state that year (Center for Urban Policy et al, 1999).

- In Nebraska an average of $46 million spent on statewide historic rehabilitation per year from 2001 to 2005 resulted in 1,004 jobs, and additional $31 million in income and 45 million in GDP at the national.

- Every million dollars invested in residential historic rehabilitation generates approximately 36 jobs, $1.24 million in income and nearly $200,000 in state and local taxes.

- Heritage tourism in Philadelphia supports over 45,000 jobs and $3.5 billion in economic activity annually.

- In 2010, 15 million visitors to Civil War Battlefield managed by the National Park Service in just five states (MO, PA, SC, TN, and VA) generated 7,700 jobs.

- Properties in historic districts have increased values, generally around 20% higher than other similar properties elsewhere.

Cross-Cutting Department of Interior Activities

- Overall, in 2010 activities associated with DOI lands provided more than 2.2 million jobs for Americans, which generated $377 billion in economic activity.

- Water, timber and forage activities on DOI land supported about 370,000 jobs and $50 billion in economic activity.

- About $2 billion was spent on construction and maintenance activities related to recreation and conservation, which supported about 41,000 jobs and contributed about $5.7 billion in economic activity.

- $222 million that was spent by DOI on land acquisition was estimated to contribute about $457 million in economic activity and support about 3,000 jobs.

- The U.S. Fish and Wildlife Service contributed about $4.2 billion in economic activity and supported over 32,000 jobs through their management of 553 National Wildlife Refuges and thousands of smaller natural areas in the United States.

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Introduction

This document was commissioned by the National Fish and Wildlife Foundation to serve two purposes. The first purpose is to identify the level of impacts that natural resource conservation, outdoor recreation and historic preservation have on the U.S. economy, what data currently exists and key data gaps that must be filled. Outdoor recreation and historic preservation are included to determine areas of potential economic overlap with the Foundation's natural resource conservation mission. The second purpose is to serve as the basis for the development of an assessment tool that can be used by the Foundation to determine the economic and job activity created by the Foundation's conservation grant investments.

The information in this report stems from a desk study of academic and trade journals, websites and other publications that cover these subjects. A number of studies were found that address methodology and economics theory regarding these topics, but they are beyond the scope and intent of this report and are not included here. Only those papers and websites which contain solid economic studies with relevant data are synopsized here and listed in the bibliography accompanying this paper. Unless otherwise noted, all dollar figures in this report have been converted to 2011 dollars to account for inflation.

Each section—outdoor recreation, nature conservation and historic preservation—has been covered separately, although there is some degree of overlap between these fields. For instance, the number of visitors to National Wildlife Refuges and their impact on local, regional and national economies is relevant to both the outdoor recreation fields (due to the large usage by hunters, anglers and wildlife watchers) and to natural resources conservation (due to the value of conserving these large tracts of natural land). Similarly, historic preservation literature contains information on the impacts of property values through historic designation and the nature conservation literature contains information on property values near conservation areas. The informational pie could be cut a number of ways, but the cleanest is to keep these sections separate in the discussion that follows.

One recent study by the U.S. Department of the Interior (DOI, 2011) cross-cuts all of these areas and is presented in its own section in this report to give an idea of the overlaps. Specific topics covered in the DOI report also are repeated under the relevant sections.

A. Outdoor Recreation

Thanks to national surveys that collect information on various types of recreation in the United States, there is a body of information available on the economic impact of various forms of outdoor recreation in the country, including hunting, fishing, wildlife viewing and non-motorized outdoor recreation (hiking, paddling, skiing, etc.). A few types of outdoor recreation, however, are not included in these surveys and country-wide impacts are not available, including motorized sports like off-road vehicles, snowmobiling, etc. However, a few statewide or localized studies give examples of some of the economic returns possible from these activities.

In addition, there have been a number of studies of the economic impacts from outdoor recreation in particular locations, parks and sites which emphasize the returns from these recreational activities in local communities and for the parks themselves. The results presented in this section overlap a bit with the nature conservation section when it comes to cataloguing the economic impacts from visitations to various refuges, parks and other recreational areas. Comments are provided when overlap occurs. All dollar figures have been converted to 2011 dollars to account for inflation.

1. Overall Outdoor Recreation (excluding motorized sports)

The standard reference for overall economic impact on the national level from outdoor recreational pursuits is the 2006 report "The Active Outdoor Recreation Economy" produced for the Outdoor Foundation, with data from consumer surveys conducted by Harris Interactive and analyzed by Southwick Associates, Inc. This report considers outdoor recreation to include bicycling, camping, fishing, hunting, paddling, snow sports, hiking, climbing and wildlife viewing, with data available both regionally and nationwide for these activities. Hunting, fishing and wildlife viewing impacts were obtained from other sources and added into the Outdoor Foundation study. Specifically, research conducted by Southwick Associates on behalf of the Association of Fish and Wildlife Agencies and the American Sportfishing Association for hunting and sport fishing, respectively, were built into the Outdoor Foundation estimates and the wildlife viewing impacts were obtained from the U.S. Fish and Wildlife Service. These three fish and wildlife-based recreation reports were developed using expenditure and participation data from the U.S. Fish and Wildlife Service's and U.S. Census Bureau's 2001 National Survey of Fishing, Hunting and Wildlife-Associated Recreation, and updated in 2006/07. The next national survey of fishing, hunting and wildlife recreation will be available by mid to late 2012.

Very limited information were available regarding participation and economic contributions from motorized sports like motorcycles, off-the-road vehicles, recreational vehicles and snowmobiling. This represents a significant gap in the literature and in the overall estimates of recreation's economic contributions.

In 2006, the Outdoor Foundation concluded that the total economic activity from outdoor recreation in the United States is $730 billion a year and generates 6,435,270 jobs in the country. Included in this total is $46 billion in gear retail sales, $243 billion in trip related sales and nearly $88 billion in federal and state taxes. These contributions come from both direct and ripple effects throughout the economy. Outdoor recreation sales (gear and trips combined) of $289 billion per year are greater than annual returns from pharmaceutical and medicine manufacturing ($162 billion), legal services ($253 billion) and power generation and supply ($283 billion), showing the sizeable impact recognized from outdoor recreation.

The national level impact from individual outdoor recreation is illustrated in Table A1. Of all the activities itemized, camping and biking provided the most jobs and had the largest economic impacts in the country.

Table A1: Economic Impact from Outdoor Recreation in the United States (2006, Outdoor Foundation)

	Number of Participants (millions)	Jobs Supported (thousands)	Gear Related Sales (billions)	Trip Related Sales (billions)	Fed and State Taxes (billions)	Total Economic contribution (billions)
Bicycling	59.8	1,135	$6.2	$46.9	$17.7	$132.8
Camping	45.1	2,334	$8.7	$100.6	$36.4	$273.0
Fishing	32.9	587	$6.4	$16.2	$4.1	$61.4
Hunting	12.8	323	$6.9	$5.5	$2.2	$34.1
Paddling	23.6	308	$2.7	$11.8	$4.8	$36.1
Snow-based	15.6	567	$3.1	$23.4	$8.8	$66.3
Trail-based	55.8	716	$3.3	$30.2	$11.2	$83.7
Wildlife Viewing	66.1	467	$8.8	$8.6	$2.7	$43.5
Total	--	6,435	$46.2	$243.2	$87.9	$731

2. Hunting, Fishing and Wildlife Watching

Hunting, fishing and wildlife-watching segments of the active outdoor recreation sector have been thoroughly studied and reported on for individual states and for the nation as a whole (US DOI, 2006). These data were incorporated into the Outdoor Foundation report discussed above. Additional details are presented in Table A2, based on the 2006

National Survey conducted by the U.S. Census Bureau on behalf of the U.S. Fish and Wildlife Service.

Table A2: Annual Participants and Expenditures for Hunting, Fishing and Wildlife Watching in the United States (US DOI, 2006)

Participants	87.5 million
Expenditures	$137.4 billion
Sportspersons	
Total participants*	33.9 million
Anglers	30.0 million
Hunters	12.5 million
Total days	737 million
Fishing	517 million
Hunting	220 million
Total expenditures	$86.1 billion
Fishing	47.4 billion
Hunting	25.7 billion
Unspecified	13.0 billion
Wildlife Watchers	
Total participants**	71.1 million
Around the home	67.8 million
Away from home	23.0 million
Total expenditures	$51.3 billion
* 8.5 million both fished and hunted.	
** 19.7 million both viewed wildlife around the home and away from home.	

In 2006, hunters and anglers spent $86.1 billion including trip-related expenses ($25.7 billion), equipment costs ($47.4 billion) and other expenditures ($13.0 billion) for items like magazines, permits, concession fees, etc. In addition, wildlife watchers in the United States spent $51.3 billion including trip-related expenses ($14.5 billion), equipment costs ($26.1 billion) and other costs ($10.8 billion) such as magazines, landscaping to attract wildlife and contributions to conservation organizations. These figures include expenditures for vehicles, boats, real estate and other large ticket items not included in the Outdoor Foundation's comprehensive outdoor recreation impacts.

A recent report (Southwick and Loftus, 2011) looking at the impact of excise taxes on hunting, shooting and fishing equipment found that in 2009 nearly $1.2 billion was collected from excise taxes on firearms, ammunition, archery equipment and ammunition, adding still more money to the economy via conservation efforts enacted by state conservation agencies – the recipients of these dedicated excise taxes.

Another study completed at about the same time assessed the economic impact of hunting, fishing and wildlife watching specific to National Forestry Service (NFS) lands (American Sportfishing Association, 2007). Data used in the American Sportfishing Association (2007) report stems from 2000-2003 visitor counts and spending information within 50 miles of NFS lands, as collected by the NFS via its National Visitor Use Monitoring survey (NVUM). Overall, hunters spent $1,100 million annually to hunt NFS lands, which supported 21,400 jobs across the country and provided $137 million in federal income taxes. Anglers spent $729 million annually, which supported 14,500 jobs and provided $81 million in federal income taxes. Wildlife viewers spent another $207 million in retail sales on or near NFS lands, which supported another 4,700 jobs and provided nearly $18 million more in federal taxes. The combined spending effect of these outdoor activities on NFS lands totaled $2.1 billion in annual retail sales, supported 40,600 jobs and provided $236 million in annual federal taxes. This data also shows some of the economic impacts of conserving natural habitats and is mentioned in the report section on nature conservation as well.

Additionally, the ripple effect greatly increases the economic contribution of fish and wildlife-based recreation on NFS lands. Table A3 below shows the total economic impact of hunting, fishing and wildlife watching on NFS managed land in the United States, based on 2000-2003 survey data and analysis of spending within the state where each forest unit is located (not limited to the 50 mile radii around each unit).

Table A3: The Annual Economic Effects of Hunting, Fishing and Wildlife-Viewing within U.S. Forest Service-Managed Units (American Sportfishing Association, 2007)

	Retail Sales (millions)	Total Ripple Effect (millions)	Salaries Wages & Business Profits (millions)	Jobs (Full & Part-time) (thousands)	Sales/ Fuel Tax Revenues (millions)	State Income Tax Revenues (millions)	Federal Income Tax Revenues (millions)
Hunting	$5,138.9	$14,052.7	$3,488.1	97.1	$198.7	$55.7	$621.2
Fishing	$2,755.2	$7,770.0	$2,016.6	57.7	$133.8	$35.2	$324.9
Wildlife Watching	$1,590.7	$3,966.5	$1,149.3	34.6	$85.8	$29.4	$134.6
Totals	$9,484.8	$25,789.2	$6,654.0	189.4	$418.4	$120.3	$1,080.6

3. Boating and Motorized Outdoor Recreation

Motorized outdoor sports include activities like off-road driving, snowmobiling, dirt biking and other sports engaged in on public and private lands, as well as boating on U.S. inland and coastal waters.

Recreational boating is a large sector of outdoor recreation in the United States and data is readily available on its overall economic impact. According to the National Marine Manufacturers Association (NMMA, 2010), in 2008, nearly 66 million people in the

United States went boating at least once, representing 28.3% of U.S. adults. In 2008 there were 5,284 recreational marine manufacturers which employed more than 135,900 people and generated $2.9 billion in revenue. There were also about 33,000 retail boating/service businesses, which employed another 217,718 people. In all, in 2009, recreational boating generated $32.5 billion in sales and services.

The economic impacts of other terrestrial forms of motorized outdoor sports, like snowmobiling and the use of off-highway vehicles have not been as well studied. In a handful of states, studies have looked at the economic impact of these sports, but there is no comprehensive overview of the collective impact of these activities on the national level. A Bureau of Land Management online PowerPoint® presentation (US BLM, 2006) states that "motorized outdoor recreation" contributes an additional $25 billion in total economic impact in 1998 but gives no source for this figure. This figure may relate to just BLM lands.

The national numbers are most likely much higher than the BLM estimates. In Arizona, for instance, an Arizona State University study (Silverman, 2003) based on a questionnaire survey found that off-highway vehicle recreation in 2002 accounted for nearly $4 billion in spending, which created a statewide economic impact of $5.23 billion, added $230 million to annual state tax revenues and supported 36,951 jobs in Arizona.

A similar study looking at the impact of off-highway vehicle recreation in four central Florida counties (Parent et al, 2007) found that combined resident and non-resident riders' expenditures for equipment and travel was $15.3 million in 2006. This amounted to $24.3 million in total output, indirect taxes of $2.40 million and provided 318 jobs in the region, a rural area of Florida where other forms of employment are scarce.

Based on studies like these, there is no doubt the outdoor motorized sporting community has a strong economic role in the United States, but further national level study is needed to measure this.

B. Nature Conservation

Natural resources conservation includes preserving natural ecosystems like wetlands, forests and meadows, conserving endangered and threatened species, protecting biodiversity, and all programs, projects and properties required to do so. Four main aspects of nature conservation have been addressed by economists:

1) The value of ecosystem services provided by natural areas,
2) The willingness-to-pay by residents and visitors to conserve various species,
3) The revenue accrued by visits to natural areas, and
4) Property values that are impacted by proximity to protected and natural areas.

All dollar figures reported here, unless otherwise noted, have been converted to 2011 dollars to account for inflation.

1. Ecosystem Services

Ecosystem services include all the functions performed by nature that provide benefits to humans. Basic services include climate regulation[1], waste treatment[2], water supply[3], carbon sequestration[4], nutrient cycling[5], habitat provision[6] and many others that all help modulate and regulate climate, weather and various resources needed for human comfort, security and well-being. Saltwater wetlands, freshwater wetlands, temperate and tropical forests, grasslands, lakes, etc. all provide different levels of a myriad of environmental services.

In recent years, the valuation of ecosystem services has blossomed into a booming academic field. Hundreds of papers on this topic appear in various technical and trade journals. But many of these are discussions of different ways to approach this task and do not provide quantified results. Just a few of them yield numbers that relate to more than a few specific sites but are typically focused on a limited set of dimensions. A variety of international online data bases attempt to catalogue these studies and more efforts are currently underway (McComb et al, 2006).

One benchmark study that initiated this burgeoning field of literature was produced by Costanza et al (1997). A group of renowned environmental economists gathered for a week with the express purpose of developing global numbers to represent the value of ecosystem services for all habitats on earth. Nearly 3,000 papers have cited the resulting

[1] Climate regulation includes temperature and precipitation regulation and other overall impacts on the climate, locally and globally
[2] Waste treatment water purification, pollution control, etc.
[3] Water supply includes flood control, storage and replenishing of water, etc.
[4] Carbon sequestration is the capture of carbon dioxide and the regulation of atmospheric gases
[5] Nutrient cycling includes the capture, storage and recycling of necessary nutrients
[6] Habitat provision includes providing refugia for resident and transient populations of animals, plants, etc.

study and the numbers, adjusted for current inflation rates, appear in many articles. No other attempt has yet been made to reproduce these findings. For now, these numbers still represent the state of the art, although they are nearly fifteen years old.

In the United States, one recent study estimates the value of ecosystem services provided by the USFWS National Wildlife Refuges in the contiguous United States (Ingraham and Foster, 2008). Using 1992 land cover data, these researchers determined the extent of various habitats in all the refuges, including 13.3 million acres composed of about 27% shrubland; 18% wetland; 17% open water; 13% planted/cultivated; 11% grassland; 10% forest; 4% barren; 1% developed; and less than 1% perennial ice/snow. Following a thorough analysis of the literature, they calculated an estimate, essentially an average, for all relevant North American economic valuation studies for the major habitats represented in the National Wildlife Refuge System. This effort focused on a handful of major ecosystem services most widely analyzed in the economic literature: carbon sequestration, disturbance prevention (e.g., flood control), freshwater regulation and supply, waste assimilation and nutrient regulation and habitat provision. The total value of ecosystem services provided by the acreage of major different habitats in these refuges totaled $32.3 billion/year, or $2,900 thousand/acre/year.

When these figures were extrapolated to the contiguous 48 U.S. states (using U.S. 2006 National Land Cover Survey Data) and for all of the United States, including Alaska and Hawaii (using 2001 NLCS Data) it is evident that the contribution made to the environment by natural lands is far from trifling. In fact, the total amount of ecosystem services provided by these categories of natural land amount to about $1.6 trillion, which is more than 10% of the GDP in 2009 when land in the contiguous United States is tallied. Although Ingraham and Foster (2008) specifically did not include National Wildlife Refuges in Alaska and Hawaii (and these may have unique differences), if their numbers are extrapolated to these areas, the total amount of ecosystem services provided per year in the entire United States is more than $2 trillion. Results from the Ingraham and Foster study, in 2011 dollars and extrapolated to the contiguous United States, are presented in Table B1. These numbers only reflect terrestrial environments and do not include the sizeable contributions from surrounding seas.

Table B1: Ecosystem Services provided by Natural Habitats in the Contiguous U.S. States, based on Ingraham and Foster (2008) and using U.S. National Land Cover Survey Data (2006)

Classification	Dollars/ Acre	Acres in National Wildlife Refuges (millions)	Value of Ecosystem Services from National Wildlife Refuges (millions)	Acres in the Lower 48 U.S. States (millions)	Total Value of these services (billions)
Forest	$1,014.27	1.12	$1,132	498.18	$505.3
Shrubland	$660.13	4.58	$3,020	426.50	$281.5
Grassland	$61.67	1.39	$85	288.93	$17.8
Wetlands	$10,608.43	2.60	$27,536	102.23	$1,084.5
Total		9.69	$31,775	1,315.84	$1,889.2

When different land cover classes were separated in the Ingraham and Foster study of ecosystem services of National Wildlife Refuges, wetlands were found to provide the most services, about $27.5 billion annually or $10,600/acre/year. Costanza et al (1997) found a similar value for wetlands ($8224 dollars/acre/year) when their original numbers were converted from hectares to acres and in 2011 dollars. Costanza et al also individually detailed the different ecosystem services that wetlands provide. The economic estimates for these services are presented in Table B2. The loss of wetlands over the past few decades has resulted in a concomitant loss of ecosystem services.

According to the U.S. Environmental Protection Agency's Report on the Environment 2008, since the 1950s about 9.9 million acres of wetlands have been lost in the United States. As seen in Table B2, this represents an economic loss of more than $81 billion in all wetlands-related ecosystem services. When a similar analysis is run using the total wetlands ecosystem services values calculated by Ingraham and Foster, the results are comparable, showing a total loss of about $105 billion. Although Ingraham and Foster did not break down wetlands services into subcategories, their figures for wetlands services also fell into the same range. Whichever number is most accurate, it is clear that the total loss of ecosystem services from the loss of wetlands between the 1950s and now is substantial.

Table B2: The value of ecosystem services provided by wetlands, based on analysis of Costanza et al (1997) and amount of loss of these services since the 1950s

Ecosystem Service	**Dollars/acre/year**	**Value of Services lost from wetlands since 1950s (millions)**
Gas Regulation	$82	$812.29
Disturbance Regulation	$2,800	$27,721.93
Water Regulation	$9	$91.61
Water Supply	$2,344	$23,208.49
Waste Treatment	$2,577	$25,511.02
Habitat/Refugia	$188	$1,856.68
Food Production	$158	$1,563.52
Raw Materials	$65	$647.40
TOTAL Services	$8,224	$81,412.94

A similar analysis could be done for other natural areas in the United States, the different types of forests, lakes, deserts, grasslands, etc. Lack of conservation of natural resources presents a degradation of the ecosystem services these lands provide and an ultimate economic loss to society.

2. Value of Rare and Threatened Species

Another much smaller body of economic literature addresses the value of various species in the United States to residents and visitors to areas where these species are found. A recent meta-analysis of these studies [Richardson and Loomis (2009)] found that on a household basis, people would pay an average anywhere from $8 (striped shiner), $19 (sea turtle), $36 (bottlenose dolphin), $56 (whooping crane) up to $241 (Washington State anadromous fishes) annually in 2006 dollars to preserve populations of various rare, endangered or useful species (Table B3). Further analysis demonstrated that the amount people were willing to pay varied depending on if they were residents or visitors to an area where the species exists, the rarity of the species, the charisma of the species and a variety of other factors. It is unlikely that most households in the U.S. including those far from the habitat of the targeted species would pay such sums, so an aggregate number extrapolated nationally is not valid, but it gives some idea of the existence value people place on the wildlife around them.

Table B3: Summary of economic value of threatened, endangered and rare species based on a meta-analysis of willingness-to-pay studies by Richardson and Loomis (2009)

	Low Value	**High Value**	**Average of all studies**
Studies reporting annual WTP			
Bald eagle	$24	$50	$44
Bighorn sheep			$19
Dolphin			$40
Gray whale	$27	$52	$39
Owl	$44	$146	$73
Salmon/Steelhead	$11	$156	$91
Sea lion			$80
Sea otter			$45
Sea turtle			$21
Seal			$39
Silvery Minnow			$43
Squawfish			$13
Striped Shiner			$9
Turkey	$12	$17	$15
Washington state anadromous fish populations	$165	$349	$270
Whooping crane	$49	$77	$63
Woodpecker	$15	$22	$18
Studies reporting lump sum WTP			
Arctic grayling	$22	$29	$26
Bald eagle	$275	$392	$333
Falcon			$36
Humpback whale			$269
Monk seal			$186
Wolf	$25	$182	$68

Eagle and Betters (1998) used a similar analysis of some of the earlier willingness-to-pay studies and broke down the results per individual animal of each species considered, extrapolated to the national level. Thus, for instance, when the willingness to pay for maintaining whooping cranes ($44) was divided by the number of cranes alive in the wild at that time (109) and extrapolated to the national level, each individual crane had a worth to citizens of $36 million dollars. The authors used such calculations to make a case that the fines levied for illegal taking of endangered species are far less than the value these species have to Americans and the fines should be based on the rarity and value of each individual species, not a much smaller fine, uniform across the board.

3. Visits to Natural Areas

Other sections of this report look at overall values for outdoor recreation like hunting, fishing, boating, nature-viewing, etc. There is also a body of literature that relates specifically to the economic impact of various parks and reserves. Although much of this economic impact is due to outdoor recreation, other visitors may come to these areas for sight-seeing, for family gatherings, for educational benefits and for many other values not captured by the category of outdoor recreation.

In June, 2011 the U.S. Department of Interior (DOI) produced a report on their economic contributions and, among other things, provided current information on park visitation and the economic benefits accrued from these activities. For all of their bureaus combined, 439 million visits were made to DOI lands, which supported 388,000 jobs and provided more than $47 billion in economic activity. National parks, monuments and recreation areas, National Wildlife Refuges and Bureau of Land Management lands involve the most recreational visitors. These lands are also the ones most involved in natural resources conservation, another way of showing the impact that preserving these lands has on the economy.

Table B4: Visitors to Department of the Interior Lands (DOI, 2011) and their economic impact in 2010

	Recreational Visits	**Value of Recreational Visits (millions)**	**Estimated Economic Impact (millions)**	**Estimated Employment Impact (# of jobs)**
Bureau of Land Management land	58,643,712	$2,967	$7,715	58,947
National Parks, Monuments, Recreation Areas (NPS)	285,279,021	$12,356	$31,574	246,956
National Wildlife Refuges (USFWS)	44,849,524	$1,554	$4,138	32,564

One detailed study of visitation to National Wildlife Refuges (Caudill and Henderson, 2005) looked further into the impacts on the local communities around these reserves in 2004. In 2004, there were 36.7 million visitors who generated $1.64 billion of economic activity in regional economies, similar to the figures reported in Table B4 for 2010. Caudill and Henderson went further into their analysis and showed that about two-thirds of the total expenditures were generated by non-consumptive activities and not fishing (27%) or hunting (5%), which illustrates the value these natural areas have for passive enjoyment of nature. The authors also conducted willingness-to-pay studies to determine the value of these refuges beyond what it actually cost them to visit. They found that

visitors showed a consumer surplus of more than $1.3 billion, with $816 million of this amount attributed to non-consumptive visitation.

The value of National Parks to local communities was reported by Stynes (2011) in a detailed analysis. In 2009, visitors to National Parks spent $12.56 billion in "gateway" areas adjacent to the parks and more than 56% of the total spending was by visitors who stayed outside the parks. Nationally this visitor activity accounted for 247,000 jobs, $9.66 billion in labor income and $16.46 billion in value added. The local impact across all parks amounted to direct and secondary effects of 149,500 jobs, $4.56 billion in labor income and $7.74 billion in value added.

Seventeen National Monuments in the western states that have been established since 1982 were also the subject of a study on the impact on local communities (Headwaters Economics, 2011). Although the results varied, all of the communities showed an increase in economic growth after the monuments were officially designated. Similar results were found by Lorah and Southwick (2003) and others regarding healthier economic growth rates in communities adjacent to federally protected lands compared to communities dependent on extraction industries.

The Army Corps of Engineers also maintains some land that is in a natural state. In 1996, recreational visitors spent, $8.3 billion on trips within 30 miles of these sites, contributing $4.4 billion in direct income and supporting 180,000 jobs all in the local economy (Stynes et al, 1996). When the analysis was expanded to the national level, the results were even larger. The effects of the visits on the national economy were $34.0 billion in sales, contributing $17.1 billion in direct income and supporting 420,000 jobs.

In addition to all these federal lands, there are countless state parks and county parks that all preserve natural habitats and many, if not most, also charge admission. A myriad of individual studies exist for many of these parks, and their cumulative effect on jobs and expenditures as well as their total economic impact due to nature conservation and recreation is no doubt another highly significant factor to consider. The results of some of these studies are considered under the outdoor recreation section of this report.

4. Property Values

Another way to look at the value of nature conservation is to look at property values near protected areas, open spaces and other natural amenities compared to property values without such proximity. Unfortunately, there are no studies that look at the overall value of properties near national parks, wildlife refuges or other open spaces, just a myriad of single-site studies.

One such study (Neumann et al, 2009), for instance, looks at the property values near a National Wildlife Refuge (NWR) in central Middlesex County, Massachusetts compared to values near other types of open space, including golf courses, recreation parks, cemeteries, conservation land, etc. The authors found that properties closer than 100

meters to the NWR had property prices $1,075 higher than those further away. They found similar premium prices for proximity to golf courses and sports/recreation parks but found no such premium effect for those properties close to cemeteries and conservation areas—other forms of open space. This study focuses on a NWR in a suburban area and the authors are confident that these results can be applied to property values around other suburban NWRs. However, there is no simple way to determine how many of the 550 plus NWRs are considered to be "suburban" and therefore it is not possible to estimate the overall value contributed by NWRs on a national scale.

Another study looked at 20 years of research into property values near different categories of parks, from urban to specialized recreational parks, and included natural parks (Crompton, 2005). Overall, this study found a 20% increase in property values where properties are next to a passive park and suggests that these numbers can be used more widely to estimate the economic contributions of parks.

Lutzenhiser and Netusil (2001) were able to study Portland, Oregon and they show tangible benefits to property values for parcels in proximity to parks that were urban (with most of the area landscaped), natural (which are maintained primarily for wildlife and passive recreation like hiking and bird-watching) or specialty (maintained for only one purpose, i.e. boat ramps). The rates are presented below in Table B5. It is evident that those properties near the natural parks had the most increased value from this proximity, in some cases realizing nearly a 20% boost in property value because of their proximity to a natural park.

Table B5: Property value increases, as percentage of the average home value, for parcels in proximity to different types of parks in Portland, Oregon. Based on Lutzenhiser and Netusil (2001)

	Urban park	**Natural Park**	**Specialty Park**
Distances in Feet			
Less than 200	2.91%	16.93%	11.17%
201–400	3.11%	15.43%	8.68%
401–600	1.80%	19.07%	15.53%
601–800	1.23%	17.02%	8.55%
801–1,000	1.42%	13.57%	7.51%
1,001–1,200	2.55%	12.28%	6.89%
1,201–1,500	0.52%	15.08%	5.80%

These figures cannot be expanded to other areas of the country, but the 20% extra value determined by both the meta-analysis of many studies (Neumann et al, 2009) and the nearly 20% increase for some properties near natural parks give an indication of the overall increase in property values that are possible when the worth of neighboring natural areas are considered.

C. Historic Preservation

Historic preservation generates economic benefits in a number of ways, including the ripple effect through the economy due to restoration work, effects on property values in historic areas and districts, visitor and tourist spending, and other surprising features such as income through the film industry and other media seeking historically preserved sections of large and small cities across the country.

A number of papers have looked at the economic impacts of historic preservation in various cities and for select historical sites like Civil War battlefields. A comprehensive, national report was issued in 2010 by Rutgers University on behalf of the National Trust Community Investment Corporation (a subsidiary of the National Trust for Historic Preservation). This document provides the primary estimates on the economic returns from preservation efforts.

The Advisory Council on Historic Preservation (http://www.achp.gov/economic-statewide.html) provides an exhaustive bibliography of numerous state-wide studies showing the economic effects of historic preservation activities, but no overall summary of these findings is available, and for the most part the studies focus on different dimensions of the issue using different tools making them difficult to compare.

Two recent in-depth papers looking at historical preservation in Connecticut (Place Economics, 2011) and Philadelphia (Econsult, 2010) have ample data that is thoroughly analyzed and provides strong insight into the economics involved, at least in these two different areas. The results of these two studies form the basis of this review, with some added older studies providing similar examples. All monetary estimates are reported in 2011 dollars.

1. Rehabilitation Work

The National Trust Community Investment Corporation (Listokin and Lahr, 2011), based on reported use by communities, developers and other of federal tax credit provisions, were able to estimate the economic activity and impacts resulting from historic rehabilitation efforts. Table C1 presents a summary of the comprehensive results. Nationally, the federal tax credits returned more than $22.3 billion in federal tax dollars since 1978 on $17.5 billion in tax credits – a return of 27.4% from every dollar invested. This activity had an annual average impact on U.S. economic output of $6.6 billion, supports 61,200 jobs and generated $935 million in tax revenues.

Table C1: Total Annual Economic Impact of Historic Preservation Efforts Nationally, per Rutgers University (2010)

	Total Jobs	**Total Income, or earnings**	**Total Output**	**Total Local, State, & Federal Tax Revenues**
National Impacts	61,200	$2,390,000,000	$6,649,000,000	$935,000,000

A detailed study of economics and historical preservation and rehabilitation activities in Philadelphia (Econsult, 2010) found that the preservation work itself produced large scale economic benefits to Philadelphia and the rest of the state. In Philadelphia, various tax credits spurred more than $4.5 billion of private investment on historic preservation work between 1998 and 2008. This activity had an annual average impact of $662 million in total expenditures, supported 2,840 jobs and earned $107 million in earnings (salaries, wages and business profits) for the city of Philadelphia (Table C2). The citywide impacts included federal tax credit projects, investment by private owners, NGOs (non-governmental organizations) and residential conversion of homes.

On the statewide level, the Philadelphia rehabilitation efforts resulted in average annual impacts of $1.1 billion in total expenditures that supported 9,560 jobs and $366 million in earnings within the state of Pennsylvania (Table C3). Tax revenues from this work included $6.6 million local taxes for the city and an additional $25.3 million in tax revenues for the state.

Table C2: Total Annual Economic Impact of Various Historic Preservation Efforts in Philadelphia from Econsult Corporation (2010)

City of Philadelphia	**Federal Tax Credit Projects**	**Investment by Private Owners**	**Investment by Gov. and NGOs**	**Residential Conversion of Historic Properties**	**Total Annual Impact All Project Types**
Total Output ($ millions)	$224	$257	$67	$115	$662
Total Employment	960	1,100	290	490	2,840
Total Earnings ($millions)	$36	$42	$11	$19	$107
Total Local Tax Revenues ($millions)	$2.20	$2.60	0.7	$1.20	$6.60

Table C3: Estimated Total Economic Impact of Historic Preservation Efforts on the Commonwealth of Pennsylvania from 1998 to 2008 in 2011 Dollars (Econsult, 2010)

	1998-2008 Total	**1998-2008 Annualized**
Direct Expenditures (millions)	$4,679	$467
Indirect and Induced Expenditures (millions)	$6,763	$676
Total Output (millions)	$11,443	$1,143
Total Employment	95,630	9,563
Total Earnings (millions)	$3,666	$366
Total State Tax Revenues (millions)	$252	$25.3

The state of Connecticut has been in the forefront of recognizing the value of tax credits for historic rehabilitation in spurring economic growth and has three on-going tax credit programs: the Historic Homes Tax Credit, the Historic Structures Rehabilitation Tax Credit and the Historic Preservation Tax Credit. The results of a recent study into the economic effects of these enhancement programs from 2000 to 2010 has been thoroughly analyzed (Place Economics, 2011) showing a considerable impact in various economic indicators listed below.

Table C4: Historic Preservation in Connecticut: 2000-2010 (Place Economics, 2011)

$46 Million	Private sector investment in historic buildings
$251 Million	Direct salary and wages in Connecticut from rehabilitating historic structures
$133 Million	Indirect salary and wages in Connecticut from rehabilitating historic structures
$15.1 Million	Personal Income Taxes from rehabilitating historic structures
$15.7 Million	Grants to local governments and non-profit organizations
$11.2 Million	Sales Taxes from historic preservation projects
$8.1 Million	Increased property taxes to local governments each year
$2.1 Million	Business Income Taxes from rehabilitating historic structures
4,144	Direct jobs in Connecticut from rehabilitating historic structures
2,293	Indirect jobs in Connecticut from rehabilitating historic structures

Similar situations arise in other states where rehabilitation of historic properties has been studied. For instance, in the state of Texas, in 1997 rehabilitation efforts created more than 4,200 jobs in Texas and overall historic preservation activities created more than 40,000 jobs in the state that year (Center for Urban Policy et al, 1999). In Nebraska an average of $46 million spent on statewide historic rehabilitation per year from 2001 to

2005 resulted in 1,004 jobs and an additional $31 million in income and $45 million in GDP at the national level (Lahr, M. and D. Listoken, 2007).

A few studies also look specifically at the amount of return from tax credits for historic redevelopment. In the State of Maryland, for instance it was found that tax incentives stimulated an $8.53 return from private sources on every state dollar invested (Cronyn, J. and E. Paull, 2009).

Another case study (Billington, 2004, 2005) looks at leveraging federal funds to gain more private sector investment in one of the 23 National Heritage Areas managed by the U.S. National Park Service. In the Blackstone Valley National Heritage Corridor in Massachusetts and Rhode Island from 1984 (when the National Heritage program began) to 2003, the National Park Service invested about $15 million, which generated nearly $8 million in additional private sector funding for particular projects (neither figure adjusted for inflation).

Overall, the U.S. National Park Service invested $107.2 million into the 23 National Heritage Areas from 1984 to 2003 generating $261.7 million in private sector investment (again neither figure adjusted for inflation)--a return of more than two dollars for every one dollar of National Park Service funding invested here.

On the national level, Listoken et al (1998) compares the economic return on different types of activities and found that when compared to book publishing, pharmaceutical production and electronic component production, for instance, the economic impact from residential historic rehabilitation ranks highest in major economic measures.

Table C5: Economic Impacts per Million Dollars of Initial Expenditure

Economic Effect (National)	**Residential Historic Rehabilitation**	**Book Publishing**	**Pharmaceutical Production**	**Electronic Component Production**
Employment (jobs)	36	35	28	30
Income	$1,240,000	$1,160,000	$1,045,000	$1,018,000
GDP	$1,672	$1,722	$1,546	$1,483
State taxes	$106,000	$103,000	$93,000	$87,000
Local taxes	$89,000	$86,000	$79,000	$74,000

Additionally, historic rehabilitation represents the majority of central city construction in Baltimore, St. Louis, San Francisco and Washington D.C., bringing new life and economic return to older areas. Increasingly former factories and other "brownfield" areas are also being converted to apartments and townhouses, while retaining their historic exteriors in many cities in the country, leading to economic development in these once-blighted areas, which are often situated in scenic areas like riverfronts.

2. Historic Tourism

In the United States, heritage tourism has been found to be a lucrative market attracting well-educated and well-heeled visitors that spend more than other tourists. A recent study commissioned for the U.S. Cultural & Heritage Tourism Marketing Council (Mandala, 2009) was able to provide numbers for these assertions. This study found that the 78% of national vacationers who participated in heritage and cultural activities accounted for 90% of the economic impact of domestic tourism. Heritage travelers traveled more frequently than others and spent an average of $1050 per trip, contributing more than $203 billion annually to the U.S. economy. A number of studies have looked at the economic impact of different historical sites and regions across the United States echoing similar findings about the relevant affluence of historic visitors and the far-reaching effects of their visits on local or statewide economies, too numerous to be fully examined here.

Philadelphia is a city renowned for its historic preservation activities, spurred by U.S. National Park Service facilities and exhibits and enhanced by private enterprises, and has been relatively well-studied in this regard. Laurie (2008) refers to an older paper by Rypkema and Wiehagen for the Preservation Alliance for Greater Philadelphia which found that heritage visitors spend 45% more than other visitors and spend an average of 4.7 nights, compared to 3.3 nights for all U.S. travelers. Unfortunately, this study is no longer available for direct reference. However, the Preservation Alliance for Greater Philadelphia has continued to fund work showing economic benefits from heritage tourism. In a recent report for the Alliance (Econsult, 2010), the researchers found that heritage tourism in Philadelphia and nearby areas contributes $3.5 billion in total output, supporting over 45,000 jobs and $1026 million in earnings in Pennsylvania each year.

The economic value of visits to Civil War battlefields has also been studied recently (Harbinger Consulting Group, 2011) (Table C6). These studies measure different parameters but the major findings are summarized below.

Table C6: Representative impacts to local communities from visitation to Civil War sites in the United States (Harbinger Consulting Group, 2011)

Area	**Number of Visitors**	**Income/Wages**	**Jobs Support**	**Value added (rents and taxes etc)**
MO/PA/SC/TN/VA NPS affiliated Civil War battlefields and historic sites (2008)	15 million	$147 million	7,700	$230 million
Journey through Hallowed Ground National Heritage Area (2007)	7 million	$92 million	5,100	N/A
20 Civil War battlefields with survey data (2003-2005)	N/A	N/A	N/A	32.7 million

Civil War attractions include more than just National Park Service managed sites. In Missouri, Pennsylvania, South Carolina, Tennessee and Virginia, all states with major Civil War activity, more than 20 million people visited various Civil War attractions in 2009, resulting in large scale economic benefits throughout the area.

Natural Heritage Areas that are managed by the National Park Service also draw visitors and their dollars to surrounding communities. In one study (Stynes and Sun, 2004), it was found that 25,000 visitors in 2003 to seven National Heritage areas spent on average $123 each, adding up to $3.1 million locally, which supported 51 jobs, $960,000 in earnings and $1.5 million in value added (indirect taxes, profits, rents, etc.).

3. Property Values

Overall, a number of studies demonstrate that the property value of homes in historic districts increase once historic status is granted to the community. In a thorough, recent study of historic properties in Philadelphia (Econsult, 2011) it was found that homes within a national historic district showed a premium price of 14.3 percent and those within a local historic district received a premium of 22.5 percent over the value of homes outside these districts. Those homes in local historic districts in Philadelphia appreciated one percent more per year than other homes.

The Econsult team analyzed data from other studies as a background for their work in Philadelphia. One study from the Office of the Budget in New York City found that from 1975 to 2002, historic properties increased an average of 10.2 percent per year, while other properties only grew 9.0 percent per year. Another study in Beaufort, South Carolina analyzed by the Econsult team showed that an average house in the historic district sold for 21% more than a similar house outside the district. In Texas, cities with active historic preservation programs showed an increase in property values of 20% (Center for Urban Policy et al, 1999). Other similar studies exist for a number of localized areas around the country.

4. Other Economic Benefits

Historic preservation activities reap other economic rewards in addition to increased property values, revenue from tourism and the direct result of construction and restoration activities. One sector that has been analyzed is the value of historical neighborhoods from the film-making industry.

The city of Philadelphia reaps rewards from its preservation of large blocks of historic buildings and various historic sights as a location for films, television shows and other media requiring historical backdrops. About $116 million was reaped in direct spending in Philadelphia accruing from the film-making industry in 2007, an amount that has

steadily increased from $31 million in 2000 (Econsult, 2010). Laurie (2008) reports that one particular movie filmed in Philadelphia, *Beloved*, for instance, brought $15 million direct economic impact to the city. These numbers are as given and not adjusted for inflation to 2011 dollars.

Even venues smaller than Philadelphia can gain economic benefits from the movie industry through their historic preservation activities. For instance, Asheville, North Carolina has drawn movie makers looking for historic locations. From 1980 to 1997 (Rykema, 1988) direct expenditures of over $4.6 billion have come to the town through the film industry, which chooses this venue in part for its historic buildings but also enhanced by its scenic location in the Appalachian Mountains.

There are many small studies of particular historical areas and their economic impact on property values, but, as with other aspects of this report, there are no generally accepted overall figures for these areas across the nation as a whole.

D. The Department of the Interior

In December, 2009, the Department of the Interior (DOI) published it's first-ever report, a preliminary one, on the "Economic Impact of the Department of Interior's Programs and Activities." In June, 2011 this report was released as a final report, "The Department of the Interior's Economic Contributions," with numbers updated through 2010. DOI is the U.S. agency most directly involved in natural resources conservation and their findings are relevant to this report. Monetary amounts are reported in 2011 dollars.

Key findings relevant to this review are:

- Overall, in 2010 DOI provided more than 2.2 million jobs for Americans, which generated $377 billion in economic activity.

- About 439 million visits were made to DOI land—national parks, monuments, recreation areas, fish and wildlife refuges, etc. These visits supported more than 388,000 jobs and contributed more than $49 billion in economic activity. This amounts to about 8% of the direct output of personal consumption tourism expenditures in the U.S. and about 1.3% of direct tourism related employment.

- Water, timber and forage activities on DOI land supported about 370,000 jobs and $50 billion in economic activity.

- About $2 billion was spent on construction and maintenance activities related to recreation and conservation, which supported about 41,000 jobs and contributed about $5.7 billion in economic activity.

- $222 million that was spent by DOI on land acquisition was estimated to contribute about $457 million in economic activity and support about 3,000 jobs.

- The U.S. Fish and Wildlife Service contributed about $4.2 billion in economic activity and supported over 32,000 jobs through their management of 553 National Wildlife Refuges and thousands of smaller natural areas in the United States.

The DOI report gives an overall synopsis of all DOI activities and includes details for topics beyond the realm of natural resources conservation. It does not look into other areas of economic relevance, including the value of ecosystem services, property values around natural lands and other aspects relevant to this study. It also appears to not consider the multiplier effects or economic activity occurring outside of DOI lands as a result of recreational activity on DOI lands, though such ex-situ impacts are considered for commercial activities such as energy extraction. Data from the DOI study are included in relevant sections of this report. Other sections of this paper attempt to give an

overview of the benefits to many other stakeholders in the United States, above and beyond the efforts of a single U.S. Agency.

E. Gap Analysis and Next Steps

As this study shows, there are a number of older and more recent papers regarding various aspects of the economic side of outdoor recreation, nature conservation and historic preservation, but few studies encompass the entire United States. Most studies either deal with single sites or categories of sites, or detailed discussions of different methodologies, but overarching studies are rare. In this section we identify some of these gaps and some ideas for further study that is needed before the entire impact of these fields can be determined.

1. Overall Gaps

One major gap in the literature for all three topics regards the impact on property values for parcels based on relative location to conservation areas, recreation areas and historic areas. Regional and national averages are needed in each sector to define the overall value of these areas to the economy. Similar methodology could encompass the entire spectrum of these properties to make comparisons easy.

Another overarching gap in economic studies at the national level is the impact of state and local parks. These parks fill a variety of needs including nature conservation, historic preservation and outdoor recreation, and a single study of state parks could detail the economic effects of all of these statewide, regionally and nationally.

Additional efforts can be made to identify the return on future recreation, conservation and historic preservation investments. Initial data needed for such an evaluation tool or method were seen in the results of this review. A formalized effort can be made to provide ratios or other measures that would help identify the potential jobs, tax revenues and other economic returns from possible public dollar investments.

2. Outdoor Recreation

Thanks to the Outdoor Foundation, there is a complete breakdown of the statewide, regional and national economic impacts from a number of traditional outdoor recreations, including bicycling, camping, fishing, hunting, paddling, snow sports, trail use and wildlife viewing.

Unfortunately there are other outdoor sports that are not included in this report. One large gap is in motorized outdoor activities like the use of off-road vehicles,

snowmobiling, dirt bikes, etc. A similar study is needed to quantify the economic impacts from these activities at the national level. Similarly, although on a smaller scale, nontraditional activities like hang-gliding, parasailing and other activities need coverage as well.

The overall impact of outdoor recreation can also be measured by the increased revenue from visitors in communities surrounding recreational areas, by the impact on property values of homes near recreation areas and other means. Only a handful of studies, however, detail these economic effects from recreation.

3. Nature Conservation

Determining the economic effects of nature conservation has some similarities with the study of the economic effects of outdoor recreation and in some cases the same studies can do double-duty, especially when the effects of visitors to refuges and parks are concerned. These visitors come to these areas in large part to enjoy their outdoor recreational pursuits. The land reserved for these activities also plays a large role in the conservation of natural resources in the United States.

But, as with the analyses of outdoor recreation, most of the studies of visitors and residents and the impact on their homes and communities come from single sites or a handful of sites with particular characteristics. More studies at the national level are needed to better elucidate the overall economic impact from conserving natural lands.

Updated and more-thorough estimates on current values for ecosystems from various types of habitats and combined values are needed. Current values are old, and limited. The science is available to assign such values, but funding has not been available.

Another area that could use more analysis is the study of forests in the United States—the types of forests, the extent of these forests, and the ecosystem services that forests provide on a national level. Similarly, the amount of land converted from natural lands to agriculture and municipalities (which add little to the world's ecosystem services) could be analyzed to show the loss of these services over time and the amount that it costs to make up the difference.

4. Historic Preservation

The historic preservation impacts are well represented by Listokin and Lahr (2011). Additional work may be needed to better identify local efforts. The biggest need relates to historic tourism. A scattering of such studies related Civil War battlefields and others are available, but few look at the impact on the regional or national levels.

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