U.S. Fish & Wildlife Service

BANKING ON NATURE

The Economic Benefits to Local Communities of National Wildlife Refuge Visitation

Erin Carver
and
James Caudill, Ph.D.

Division of Economics
U.S. Fish and Wildlife Service
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Photo courtesy of Nebraska Tourism

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Executive Summary

Banking on Nature 2011: The Economic Benefits of National Wildlife Refuge Visitation to Local Communities

An enormous molten ball shoulders its way up over the edge of the sea, illuminating a golden pathway from the horizon to a lonely beach. The only witnesses are a young couple with an infant who have come to gaze in awe at a piece of the world that still looks much as it did 10,000 years ago. In a small pond behind the sand dunes, a great blue heron patiently stalks a small green frog. A mile inland, two waterfowlers tense in their thatched blind as a small band of surf scoters appear in the distance. And at the opposite end of the sprawling salt marsh, a group of students and teachers gather for a class on wetlands ecology.

National wildlife refuges enrich people in a great variety of ways. Some benefits are relatively easy to quantify─to attach a value to─and some are not. How much does that young couple value their beachfront sunrise? Or the duck hunters their excitement? Can a dollar figure─a price tag, if you will─be attached to people's dawning understanding of the marvelous workings of the natural world? What's it worth to maintain and preserve the habitat vital to the survival of the endangered jaguarundi, or any of the other endangered or threatened creatures nurtured by refuges? In today's increasingly complex society, it is important to be able to discover and clearly express the economic values of things, even such things as human experiences and "existence values" that benefit society as a whole.

This report focuses on final demand, employment, income and tax revenue effects recreational visitors to refuges have on the economies of local regions. In addition to the economic effects of refuge hunting and fishing programs in local communities, it measures the economic impact of "ecotourism," the relatively recent phenomenon of large numbers of people traveling substantial distances to take part in non-consumptive uses of the natural environment.

Ecotourism is one method to derive economic benefits from the conservation of wildlife and habitat. Many refuges were established to protect waterfowl-hunting opportunities, but as public interests have expanded beyond consuming wildlife to emphasize watching and photographing wildlife, the role of refuges has also evolved. The economic effects of ecotourism are determined to assist refuge planning and to facilitate the interaction of refuges and local communities.

This report has four main sections. An Introduction details the study's overall rationale, outlines its economic concepts, and describes the methods and data sources used. The second section presents 80 sample refuge descriptions, highlighting the recreational activities enjoyed at each refuge, analyzing the regional economic factors involved, and putting the results of this analysis into perspective. A National View section discusses the overall results for the sample refuges and extrapolates them to a nationwide estimate. Finally, Appendices provide background detail on the economic models used for the refuge estimates and the nationwide aggregation.

One way to understand the economics of national wildlife refuges is to ask the questions: "If a given refuge did not exist, what would the region's economy be like? What would *life* there be like?" The answers involve how people come to acquire things they need or want. For the purposes of this study, those needs/wants are recreational opportunities. There are two elements in the value of any commodity: what you pay for it and the additional benefit you derive from it over and above what you pay for it. Surveys show people are almost always willing to pay more for recreation than they actually spend. Economists call this additional value ***consumer surplus*** or ***net economic value.***

Refuge visitors pay for recreation through entrance fees, lodging near the refuge, and purchases from local businesses for items to pursue their recreational experience. This spending generates economic activity throughout the local economy. Some of that money "leaks" out of the local area (thus called "leakage"), and some is recycled through the local economy (the "multiplier effect"). Spending by non-residents must be separated from spending by local refuge visitors. In this study, total visitor spending is evaluated to show its significance to the local economy.

There are two major sources for the information presented in this report: the Fish and Wildlife Service's National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (NSFHWR) (2012), and the Division of Refuge's Refuge Annual Performance Plan (RAPP) (2011 data). Combining data from these sources creates a profile of refuge visitors' spending in local communities.

Daily visitor expenditures for both residents and non-residents were developed in four categories (food, lodging, transportation, and other expenses) for six activities (freshwater fishing, saltwater fishing, migratory bird hunting, small game hunting, big game hunting, and non-consumptive activities). Visitor days were factored in, and the total expenditures by category of spending for each activity were determined. These expenditures were allocated to industries, and IMPLAN calculated the final effects of these expenditures on the local economies.

This report spotlights each of the sample refuges, giving a brief overview of each refuges' main mission, wildlife, uses, and activity levels. The economy of the local surrounding area is characterized by population growth, employment, and per-capita income. The Regional Economic Analysis section presents findings of 1) Visitor Recreation-Related Expenditures, 2) Economic Effects Associated with Refuge Visitation, and 3) Summary of Economic Effects of Refuge Visitation.

One goal of this research is to generate estimates of the national impact of refuges on their regional economies. The National View section concludes by examining how the findings for the 92 sample refuges apply to the eight U.S. Fish and Wildlife Service geographical regions. The economic analysis of sample refuges facilitates a look at the big picture: an estimate of the national impact of wildlife refuges on their regional economies. Many variables affect a refuge's impact on its local economy. Some relate to the refuge and its public-use program, others to the size of the region's economy. This report's National View section reviews the detailed refuge case studies to highlight the differences among the sample refuges.

So, in the final analysis, how important is wildlife refuge-based recreation in the mix of federal outdoor opportunities? The following are some of this study's findings:

- Recreational visits to national wildlife refuges generate substantial economic activity. In FY 2011, 46.5 million people visited refuges. Their spending generated $2.4 billion of sales in regional economies. As this spending flowed through the economy, over 35,000 people were employed and $792.7 million in employment income was generated.
- About 72 percent of total expenditures are generated by non-consumptive activities on refuges. Fishing accounted for 21 percent and hunting 7 percent. Local residents accounted for 23 percent of expenditures while visitors coming from outside the local area accounted for 77 percent.
- Refuge recreational spending generated about $342.9 million in tax revenue at the local, county, state and Federal level.

Spending and employment by the refuges themselves, payments in lieu of taxes, commercial activities on refuges, and many other economic effects of refuges on local economies were not considered in this analysis.

Introduction

National wildlife refuges and management districts provide many services to people. A complete economic analysis of the refuge system would include not only the value of all the forms of recreation enjoyed but also the payrolls of refuge employees and the values of maintaining endangered species, preserving wetlands, educating future generations, and adding stability to our ecosystem. All of these services are of value to society, whether or not they result in some form of market transaction. To understand the economics of refuges, we need to ask not only "What would a region's economy be like if the refuge or management district did not exist?" but also "What would *life* be like if the refuge or management district did not exist?"

The last question refers to many aspects of wildlife refuges and management districts. As land is preserved in its natural state, a refuge provides services to the ecosystem of which it is a part. Wetlands mitigate flooding, improve water quality, and provide nursery habitat. Trees provide nesting and roosting sites for birds. Many refuges maintain habitat critical for the survival of endangered species. An economic value may be placed on these ecosystem services by considering the cost of providing substitutes for them, such as building diversion dams, artificial settling ponds, and nest sites. However, such an approach can provide only a partial value assessment because it does not account for the value people place on the ecosystem in its natural state. Endangered species are especially valued because of the possibility of their permanent loss. Some people gain value simply from knowing that wild places and unique species still exist. These existence values are difficult to measure empirically.

This report focuses on only one of the values generated by national wildlife refuges: how recreational visitors impact local income and employment. Travel to participate in non-consumptive uses of the natural environment has been called "ecotourism." It has been promoted as a way to derive economic benefits from the preservation of wildlife and habitat. Many refuges were established to protect waterfowl-hunting opportunities. Ecotourism broadens the mission of refuges.

Because natural sites are drawing increasingly more recreationists, there has been a growing interest in quantifying their impact. Such information can help in refuge planning and decision-making, and facilitate the interaction between refuges and local communities. However, refuge benefits other than recreation also exist (such as habitat preservation) and are more relevant to the National Wildlife Refuge System's mission. It would be a mistake, for example, to increase recreational opportunities at a refuge at the expense of resource preservation goals just because the added benefits could be measured by the methods used here. This analysis should be seen as only one part of the benefits that the National Wildlife Refuge System provides.

This part of the larger study analyzes the visitation records of 92 sample refuges around the country to estimate the economic role that refuge visitors play in regional economies. The sample refuges are also used to estimate the impact of refuge visitors on regional economies nationwide. Readers interested in a particular refuge not among the samples should be able to find one of these 92 case studies that is comparable to their favorite.

The next section of this Introduction explains some of the economic theory behind benefit estimation and regional impact analysis. The concepts of consumer surplus, household production, leakage, and multipliers are addressed in plain English. Also, a Glossary is included at the end of the Introduction.

The following section of the Introduction explains the details of how data were collected for this study. It covers selection of sample refuges, gathering of visitation information, data cleaning, and expenditure estimation.

The last section explains how the data are combined to generate estimates of economic activity. The assumptions and limitations of the results are emphasized.

Following the Introduction are 92 Sample Refuge and Management District Descriptions, highlighting the activities enjoyed at each one, analyzing the regional economic factors involved, and putting the results of this analysis into perspective. The report's final section, titled National View, describes how the results for a subset of the sample refuges may be used to estimate nationwide effects from refuge visitation and discusses the nationwide estimates. Technical appendices are available that provide background detail on the economic models used for the refuge estimates and the nationwide aggregation.

Recreational Economics

Recreation as a Good

Economics is about the distribution of resources. How do people come to acquire the things they need or want? Be it World Cup soccer tickets or a new species for their life lists of birds, anything people desire can be characterized economically with a dollar value. By knowing the economic cost and value of things, we can compare individuals' choices in one area with their choices in another. Knowing the cost of a home-cooked meal (cost of ingredients, preparation time, etc.) may help explain how to price restaurant meals. Knowing how much people spend on home-cooked meals also tells us about choices in the community. What will people do if food prices rise? If restaurants must pay the minimum wage, what will happen to meal prices, and how high can prices increase before people will choose to eat at home instead? It might be interesting to know the amount of economic activity in a community generated by home cooking. The same can be said about other things such as wildlife refuge recreation.

There are two components to the value of any commodity—what you pay for the commodity and the additional benefit you derive over and above what you paid. If there were no additional benefit, you would most likely not buy it since you could spend your money on an alternative good that would give some additional benefit. Surveys of the general population bear this out: Almost always, respondents are willing to pay more than they are currently paying for recreational opportunities. Economists call the additional benefit *consumer surplus* (or *net economic value*) and illustrate it with an individual's demand curve, as shown in Figure 1. The curve shows the price a person would pay for an additional unit of a given good. The person would be willing to pay price R for the first unit of the commodity. Once he has one unit, he would probably be willing to pay somewhat less for the second unit, even less for the third, etc. If he were able to actually buy the good at price P, the person would save the amount $\overline{RP}$ — the difference between what he'd have been *willing to* pay and what he *actually* paid for the first unit. $\overline{RP}$ is his consumer surplus for the first unit. Figure 1 shows that at price P, the person would buy 4 units of this good, and would have to pay 4 times P dollars. P times 4 is the area of rectangle A. The commodity's benefit that the person *does not pay for* is represented by stepped triangle C. Triangle C is the total consumer surplus for this good.

The ultimate good consumed is produced by individuals combining their time with purchased inputs to produce something else. A home-cooked meal, for example, requires food bought at the grocery store, gas for the stove, kitchen space, and time. The economic cost of the meal includes all of these inputs to its production. This is called the household production approach. To find the total cost of a meal, an economist must add up the price times the quantity of each input. For inputs that are not traded in markets, such as the time needed to prepare the meal, prices are not available. Prices paid for similar inputs, like a hired maid, may be substituted, or the price for the next best use of the unpriced input (the opportunity cost), like the wage the homemaker could have earned outside the home, can be used to approximate the unknown price.

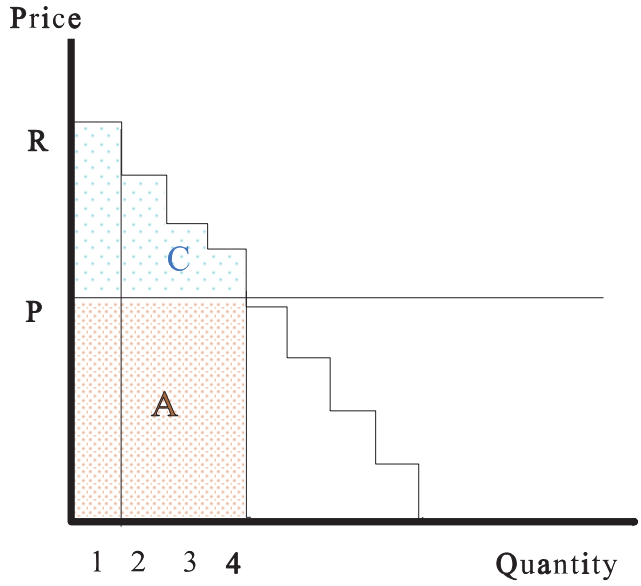
Recreation is a special kind of good. Recreationists at a refuge pay for their recreation not only in entrance fees but in the costs of traveling and staying near the refuge and taking time away from other activities. In Figure 1, all of the recreationist's costs to obtain recreation compose rectangle A. His recreational enjoyment that is over and above what he pays is triangle C, his consumer surplus.

Time is an unusual good. Spending it, outside of paid work, does not result in a flow of money from one person to another. No one pays you to watch television, for example. Similarly, refuge visitors' opportunity cost of time, although it is an important component in the cost of recreation, has little to do with the impact of recreation on the local economy. For this reason, the costs of time will not be estimated in this analysis.

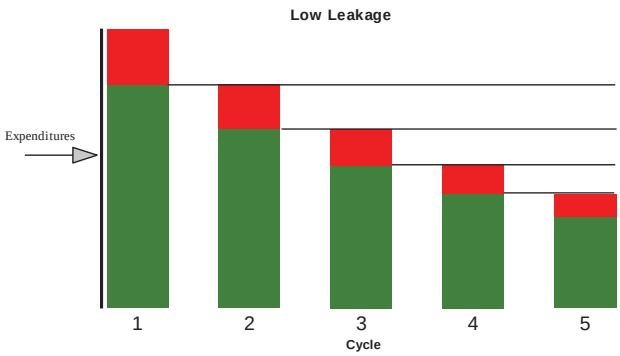
Visitors' spending generates economic activity throughout the local economy. This is only a small part of the benefits visitors receive from traveling to a given area, but it is relatively easy to quantify and important to the regional economy. This analysis will also estimate the consumer surplus derived from refuge recreation to find the total benefits derived from visits to the refuge.

Expenditures and the Regional Economy

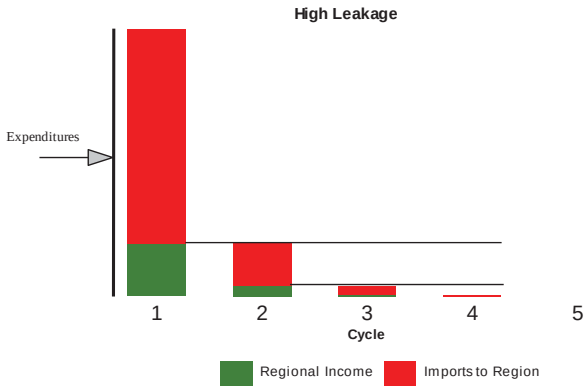
It is hard to do anything without spending money and thereby affecting economic activity. Whether it is gas to drive somewhere, feathers with which to tie flies, shotgun ammunition, or movie tickets, something is purchased to pursue the recreational experience. For the regional economy, it matters where the spending comes from. If the expenditure is from outside the region, it generates increased economic activity. If it is from within the region and would have occurred in the region anyway, it does not increase economic activity but is important for local businesses. To illustrate this idea, imagine a town consisting of one store and one citizen, an employee of the store. All of the store's expenses involve buying stock from an out-of-town wholesaler and paying the lone employee. When the employee is paid he buys his groceries at the store. Part of the purchase price goes to buy more stock, and the rest goes to the employee's next paycheck. For the employee ever to get back more than he spent someone from out of town must buy something at the store. The real workings of a modern, interconnected regional economy are far more complex, but the concept still holds that the regional economy can't grow



without importing some income from outside the region.



Thus it is important to separate spending by people from outside the refuge's economic region from spending by those who live locally. Local residents would probably have spent their recreation money in the local economy with or without the refuge. If they couldn't go birding, they might go bowling. In contrast, non-residents may have been attracted to the area by the refuge. They would have gone elsewhere except for its presence, *and* their spending is a stimulus to the economy. Non-resident spending generates new income and new jobs. It has an economic *impact* on the region. We evaluate it to show the gain to the region from having the refuge. We evaluate total spending, by both residents and non-residents, to show the *significance* of the refuge to the local economy. Significance shows how large a part of the local economy is connected to refuge activities but should not be interpreted as income that would be lost if the refuge were not there.



Leakage and Multipliers

The one-store town also illustrates the idea of "multipliers" and "leakage" from a regional economy. Each time the employee is paid and spends his income, new income is generated. Whatever the amount of the first purchase, the subsequent purchases add to the employee's income again. To the employee, it seem like his income is several times his income from the first purchase. This recycling through the local economy is called "the multiplier effect." The multiplier is the sum of the employee's income stream divided by his income from the original purchase. In Figure 2, the multiplier is then the total area of the green "Regional Income" rectangles in cycle 2 and later, divided by the area of the Regional Income rectangle in cycle 1. It shows how much local income each dollar of new spending generates as it circulates through the economy.

Leakage is the local spending that leaves, or leaks out of, the region. In the example, the stock bought from an out-of-town wholesaler is a leakage from the region's economy. Less leakage implies that more spending stays in the local economy. If there were no leakage at all, the economy would be self-perpetuating and could stay in a steady-state forever. Let's say the cost of restocking the store in the example was only 1 percent of sales. From $100 in sales, the employee would receive $99. He could spend his income and receive about $98 in wages from his second round of purchases. The original $100 purchase would recycle many times before it all left the economy. Alternatively, say the leakage is large and restocking costs 80 percent of sales. The employee would receive only $20 from the first-round purchase and only $4 in the second round. The multiplier would be very small. Figure 2 illustrates high and low leakage processes.

Leakage and the size of the multiplier depend on the degree to which the local economy provides for its own needs. Different industries have different needs, and so they import varying amounts of inputs from other regions. Thus it is important to identify the commodities that new spending will buy and know

where they are manufactured. Most small or rural regions import many products and so have a great deal of leakage and small multipliers.

Economists use statistics on employment, production, and earnings in the region, as well as information about flows of goods between industries nationwide, to develop estimates of the degree of integration of a regional economy. County-level data is used in this report. Information on larger regions can be assembled by aggregating data from several counties.

Data and Assumptions

Data Sources

Data for this study are compiled from the 2011 FWS National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (NSFHWR) and the FWS Refuge Annual Performance Plan FY2011 (RAPP). By combining information from these two sources, a profile of refuge visitors' spending in local communities may be developed. The data are further enhanced with information from refuge staff, regional tourism agencies, and other recreation providers. Refuge officials estimated the average lengths of stay from the activities available and the typical behavior pattern of visitors. This information is used to tally the number of hours visitors spend on a given refuge (usually expressed in recreation visitor days or RVDs) and on the activities in which they participate.

Every 5 years the Fish and Wildlife Service conducts the NSFHWR, which gathers nationwide information about recreationists, their activities, and their expenses. This Survey is the data source for daily visitor expenditures, which are generated for four categories: food, lodging, transportation, and other expenses (including guide fees, land-use fees, equipment rental, etc.). An input-output computer model called IMPLAN was used to generate the effect of visitors' spending on the sample 92 refuges' local economies. (For purposes of this study, a region is defined as the area within 50 miles of a refuge.)

The National Wildlife Refuge System maintains extensive data on public visitation. Nearly all the visitation data used in this study is derived from the RAPP information, which is reported by personnel at each refuge and varies with each refuge's unique situation. The methods used to collect data vary with each refuge's unique situation, location, and activities offered. For example, many refuges have tightly controlled hunts. At Las Vegas NWR, for example, goose hunters must register when they arrive and check out when they leave their assigned pit blind. Some refuges collect fees at main entrances. There is only one road into Chincoteague NWR, for example, so virtually everyone who enters can be counted and included in the RAPP data. Refuges with multiple access points or highways through refuge lands cannot count each visitor, so other methods must be adopted to estimate the number of visitors. Three common methods are car counts, foot counts, and parking-lot audits.

Car counts involve counting automobiles that pass some point on refuge roadways. A pneumatic tube attached to a counting device is placed across the road. Sophisticated counters record the time each vehicle crosses, and information is saved in a computer file to be downloaded later. This system facilitates analysis of the time of day of refuge use. Other counters simply record the number of axles crossing the tube and must be read periodically. It is easy to derive the number of vehicles crossing the tube. Observations at each refuge allow estimates to be made of the number of people entering. If a car counter is installed on an auto tour route, clear estimates can be made of the number of people using the route. If the car counter is placed at a foot-trail parking lot, the estimate may represent trail users. If several uses are available at the site, some observation of how many people do each activity may allow the refuge staff to estimate visitation for each use. Foot counters follow the same idea as car counters.

Usually they record the number of times a light beam is blocked. These devices are often used at visitor centers and may be used at trail heads.

Many refuges are accessible from public highways. Often visitors simply pull off the roadway to enter the refuge. Refuge personnel know the favorite pull-off points in their area and the activities people may pursue from that location. In hunting season, for example, hunters park along the side of Route 49 at Horicon NWR. Counting these cars and knowing that hunters usually visit in pairs or threes allows the public-use officers to estimate the number of hunters on the refuge. Anglers also have favorite parking spots around the refuge and usually fish alone or in pairs.

In FY 2006, the Service issued a Visitor Estimation Handbook to offer guidance and tips to refuges for counting visitors. The handbook was developed with the input of numerous refuges and examines a variety of techniques, such as estimating visitation using entrance fees, patrols, traffic counters.hunting registration, trails and parking areas. The handbook is used by refuges to support data entered into the RAPP and contains a number of technical appendices examining the methods in greater detail.

Sample Selection

The Division of Economics does not have the resources to thoroughly study all 560 refuges. Refuges and Management Districts included in the study were selected by Regional Office refuge supervisors.

RAPP Data Adjustments

Because RAPP visitor counts are based on several different counting methods, one visitor may be counted several times. If he drives an auto tour route, he may be counted by a car counter. If he stops to walk a trail, a trail counter may count him again. If he goes into the visitor center, a third counter may count him yet again. It is useful for management to understand how many people are using each refuge service, but for economic purposes we would do not want to overestimate a visitor's impact to the local economy. Thus, each visitor should be counted only once for his or her primary activity.

People pursue many different activities while traveling. Their visits to a national wildlife refuge may be part of a longer trip or just a stop on their way to somewhere else. Urban refuges, such as Don Edwards San Francisco Bay NWR, and refuges along major tourist routes, such as the National Elk Refuge, are particularly likely to have many visitors spending short periods of time on the refuge. Counting these brief visits as full recreation days would vastly overestimate the visitor spending attributable to the refuge. In this study, a full recreational day is considered as eight hours[1]. Thus, a visitor who spends 4 hours at a refuge has spent half of an RVD, and half of their expenditures for the day will be attributed to the refuge. The average length of time visitors participate in each activity is used to determine the number of RVDs for that activity. If a typical non-consumptive wildlife use day is 4 hours at a particular refuge, the number of RVDs for the refuge would be the number of non-consumptive use visits multiplied by 4/8. Refuge public-use officers estimate the average lengths of stay for each activity available on the refuge and the typical behavior pattern of visitors.

Expenditure and Consumer Surplus Data

[1]The U.S. Forest Service considers a recreation day as 12 hours long. However, unlike National Forest activities, almost all refuge uses are daylight activities.

Daily expenditure information for this study was extracted from the NSFHWR trip expenditure database (U.S. Department of the Interior et al. 2011). Each respondent who said she or he had participated in an activity was asked about the trips she had taken to pursue the activity in the reporting period. A migratory bird hunter, for example, would be asked in what states he had hunted. For each state a series of questions would reveal how many days he had hunted chiefly for migratory birds and how much he had spent or his share of spending during those days in that state. Respondents were asked to determine expenditures in nine categories which were then aggregated to four categories for analysis. To convert this individual state total to expenditures per day per trip, the total was divided by the number of days the respondent said he had pursued chiefly that activity.

Four Categories

Food:

- Food, drink, and refreshments

Lodging:

- At motels, cabins, lodges, or campgrounds

Transportation:

- Public transportation, including airplanes, buses, and car rentals
- Round-trip cost of transportation by private vehicle

Other:

- Guide fees
- Pack trip or package fees
- Public land-use or access fees
- Private land-use or access fees, not including leases
- Equipment rental

Respondents were classified as non-residents if their state of residence differed from the state where the activity occurred. Average daily expenditures were calculated for each Fish and Wildlife Service region. Smaller geographic breakdowns left too few respondents in some categories for reliable averages. These expenditure estimates are shown in Appendix 2.

Lodging expenditures appear very low in this data, ranging from $0.06 per day to $35 per day. Often, lodging expenditures are only a few dollars per day. In the NSFHWR, a trip does not necessarily begin at the respondent's residence. If someone were visiting relatives, for example, and spent a day of that visit hunting at a refuge, only the expenditures related to the time spent hunting is included. The trip would be a one day trip from the relatives' home and would have no lodging costs associated with it, even though the hunter had made an extensive trip away from his home. Hunting would be the primary purpose of the side trip but not of the entire trip away from home. Many people also camp or own recreational vehicles or own hunting cabins and so have minimal lodging costs that may be spread among several individuals.

Estimating the benefits people derive from recreation over and above what they spend—called consumer surplus or net economic value, area C in Figure 1 — is very difficult. Consumer surplus estimates were derived from a valuation question in the NSFHWR. Bass anglers, for example, were asked this question: "Fishing expenses change over time. For example, gas prices rose dramatically during the 1970s, fell somewhat during the early 1980s, and rose again in the late 1980s. Would you have taken any trips to fish primarily for bass during 1991 if your total bass fishing costs were *X* dollars more than the amount you just reported?" *X* was a different random amount for different respondents. The responses were analyzed statistically to estimate values. Though controversial, such methods are often used to derive individuals' willingness to pay for some good that, as explained above, is the heart of consumers' surplus. The aggregate consumer surplus estimates for this study were derived by multiplying the number of

RVDs for each activity by the net economic value per day found by the NSFHWR for that activity (Kaval and Loomis, 2003).

Economic Modeling

Input-Output

Input-output modeling is a statistically and arithmetically demanding task that was not routinely undertaken before the wide availability of computers. In addition to balancing and inverting matrices of numbers, the basic statistics for each area of analysis must be discovered and made consistent. Regional impact analysis has been greatly facilitated by the development of integrated modeling software that contains both consistent databases and appropriate generalized algorithms for computing multipliers and impacts. One of these software tools is IMPLAN (Minnesota IMPLAN Group, Inc., 2008). IMPLAN was developed for the U.S. Forest Service by the University of Minnesota to aid in the forest planning process. It uses regional information to modify a standard input-output framework of the U. S., developed by the Department of Commerce, Bureau of Economic Analysis, to describe local conditions. This study uses IMPLAN to generate the local economic effects from visitors' spending.

A region (and its economy) is defined as the area within 50 miles of a refuge. IMPLAN is based on county data, so the region is stretched or shrunk to fit the available data. It is important that the region include most of the day-to-day economic activities of nearby residents and likely shopping places of refuge visitors. With the counties to be included defined, IMPLAN can calculate the multipliers for each industry.

From the NSFHWR data, daily expenditures were developed in four object categories for six activities for residents and non-residents in each Fish and Wildlife Service region. That provides 12 separate budgets for each region. Multiplying each budget by the number of visitor days for that activity from the adjusted RAPP data yields the total expenditures by category of spending for each activity. These are totaled and the expenditures are allocated to industries. Food, for example, is allocated 35 percent to restaurants and 65 percent to grocery stores for residents, and 65 percent to restaurants and 35 percent to groceries for non-residents. Transportation is allocated to gas and oil, car repairs, and airline tickets. Total expenditure for each commodity is the input to the IMPLAN model. IMPLAN then works out the amount of leakage and the implied multipliers, direct expenditures, earnings, employment, and output. IMPLAN calculates the direct, indirect, and induced effects of the new expenditure. Direct effects are a measure of leakage ─ the net amount of the expenditure that stays in the region after the first round of spending. Indirect effects estimate the impact of the expenditures as they cycle through the local economy. Induced effects are a result of changes in employment, population, and income from the new spending. These effects can be summed to show the total effect. In each refuge summary in this study, we report the total effects on final demand, jobs, and job income in thousands of 2011 dollars.

"Final demand" is simply the total spending by the final consumers of all goods. The amount reported is the change in spending by all final consumers in the area attributable to refuge visitation. It should be noted that final demand is the amount of money which actually stays in the area after all leakages are accounted for.

IMPLAN's definition of "jobs" is very broad. For each industry, there is some proportion of output that goes to employee earnings (i.e., job income). In turn, there is some amount of earnings that represents one job. Dividing earnings by the job-cost constant yields an estimate of the number of jobs stimulated by visitors' spending. In the restaurant industry, for example, 75 percent of sales may go to employee

earnings and $15,000 may be equivalent to one job. So $20,000 in sales implies $15,000 in job income, and one job. IMPLAN counts full-time, part-time, temporary, and seasonal jobs equally. Therefore, job income is a better indicator of the employment effects of new spending than the jobs figure IMPLAN generates.

Generating National Estimates

Economic Significance

One goal of this research is to generate estimates of the national impact of refuges on their regional economies. Ideally, an IMPLAN model and the necessary visitation information would be developed for each refuge and the results summed for a national estimate. Such a process would be prohibitively expensive. As an alternative, the results from 92 case studies can be treated as data points. National estimates were derived using a combination of average ratios from the sample refuges in 2011 and from the sample refuges in 2006. Ratios were derived for (1) final demand per recreation visit, (2) employment income per recreation visit, and (3) jobs per recreation visit. These ratios were averaged over 2006 and 2011 respectively (adjusting for inflation). Averaging over 2006 and 2011 provided more observations (data points) to improve the accuracy of the national estimates. These ratios were then applied to estimate the economic impact of national wildlife refuges nationwide. This methodology is not the same as that used in reports prior to 2006.

Adjustments were made to the data to ensure consistency. The sample refuges' recreational visitors ranged from 3,260 to 4.4 million. Refuges in the U.S. Territories were deleted from the calculations. These areas were considered to have very different local economies which this overall model did not capture well. The model applied the average length of stay for the sample refuges to all refuges.

This technique produces estimates of final demand, employment income and jobs created by all visitor spending at each refuge. From comparison of these predictions with the case study results, it was clear that the estimates could be wide of the mark. However, the predicted values were both too high and too low so it appeared that the deviations would balance each other when applied to aggregates of refuges. For this reason, the results for refuges outside of the study sample are not reported. Only regional and national aggregates are reported.

The national estimates and refuge case studies provide a rough scale of the economic significance of refuge recreation in local communities. These results are broadly descriptive. They are not intended to provide policy direction or performance measures. Refuge management balances multiple goals. This report highlights only one component.

Net Economic Value

Net Economic Value (consumer surplus) was estimated for the sample refuges by multiplying recreational visitor days by the net economic value for that activity in that state or region.

Summary

The national estimates and refuge case studies provide a rough scale of the economic significance of refuge recreation to local communities. Whenever other studies were available, we compared those results with our results. In general, our results agree with previous estimates fairly well. These results are broadly descriptive. They are not intended to provide policy direction or performance measures. Refuge management is an imperfect balancing of multiple goals. This report highlights only one component.

Glossary

Activity: What visitors do at a refuge. In this study, visitor activities are grouped into hunting, fishing, and non-consumptive uses.

Consumer Surplus: The difference between the total value people receive from the consumption of a particular good and the total amount they pay for the good.

Economic Value (See Consumer Surplus)

Employment Income (see Job Income)

Expenditures: The spending by recreational visitors when visiting refuges. Expenditure categories include food, lodging, transportation, and other. Expenditure information is based on the 2011 National Survey of Fishing, Hunting and Wildlife Associated Recreation (NSFHWR).

Final Consumers: The people who finally use the product. Contrast final consumers with intermediate consumers who buy goods in order to sell them again.

Final Demand: The total spending by final consumers on all goods. The amount reported in this study is the change in spending by final consumers in the region attributable to refuge visitation. Final demand includes spending by people who earn income from refuge visitors' activities as well as spending by refuge visitors themselves.

FWS: U.S. Fish and Wildlife Service

FY: Fiscal Year. The fiscal year is from October 1 to September 30.

Impact: The new economic activity generated in a region as a refuge attracts non-residents to the area. This figure represents economic activity that would be lost if the refuge were not there.

IMPLAN: An economic modeling software package that applies input-output analysis techniques to regional economies.

Job Income: Income to households from labor including wages and salaries. Job income excludes returns to property and proprietorship income.

Leakage: Money lost from a regional economy by payments to suppliers outside the region.

MBR: Migratory Bird Refuge

Multiplier: Multipliers show the regional economic effects resulting from changes in final demand for a commodity or group of commodities.

Net Economic Value (see Consumer Surplus)

Non-Consumptive Use: Recreational activities that enjoy wildlife without consuming it, such as birding, photography, picnicking, etc. Non-consumptive use contrasts with consumptive uses such as hunting, trapping, and fishing.

NSFHWR: National Survey of Fishing, Hunting, and Wildlife-Associated Recreation

NWR: National Wildlife Refuge

NWFR: National Wildlife and Fish Refuge

Recreational Visitor Day: A unit of measure equal to 1 person spending 1 full day (in this study, 8 hours) recreating at a particular site. RVDs allow comparisons between visitors who stay for only short periods of time and those who stay longer.

Resident/Non-Resident: People living more than 50 miles from the refuges were considered non-residents for this study.

RAPP: Refuge Annual Performance Plan

Significance: The total economic activity in a region that is related to a refuge. Significance shows a refuge's role in the regional economy. The portion of this activity attributable to residents most likely would have occurred in the region anyway and so does not represent an incremental contribution to the regional economy. Contrast **significance** with **impact.**

Tax Revenue: Local, county and state taxes: sales tax, property tax, and income tax. Federal taxes: Social Security taxes, excise tax, income tax, corporate profits tax. Note: some taxes may not be applicable in any given region or area.

Visitors: A visitor is someone who comes to the refuge and participates in one or more of the activities available at the refuge.

Visits (visitation): A visit is not the same as a visitor. One visitor could be responsible for several visits on a refuge. For example, if a family of four went fishing in the morning and hiked a short nature trail in the afternoon, they would have contributed 8 activity visits to the refuge; yet, they are only four visitors.

WMD: Wetland Management District

Region 1

Region 1 for the U.S. Fish & Wildlife Service includes Hawaii, Idaho, Oregon, and Washington. Sample refuges selected within this region include:

Camas NWR (Washington)
Columbia NWR (Washington)
Conboy NWR (Washington)
Dungeness NWR (Washington)
Hanford Reach National Monument (Washington)
Hart Mountain NWR (Oregon)
Kootenai NWR (Idaho)
Little Pend Oreille NWR (Washington)
Malheur NWR (Oregon)
McNary NWR (Washington)
Nisqually NWR (Washington)
Ridgefield NWR (Washington)
Sheldon NWR (Oregon, Nevada)
Steigerwald Lake (Washington)
Tualatin River (Oregon)
Turnbull NWR (Washington)
Willapa NWR (Washington)

Camas National Wildlife Refuge

Description

Camas National Wildlife Refuge (Refuge) is located northwest of the town of Hamer, in Jefferson County, Idaho. The Refuge is situated in the Upper Snake River Plain and sits at an elevation of approximately 4,800 feet. The Refuge is at the northern edge of the Snake River Plains, a vast region of flat to gently rolling sagebrush hills which covers the southern third of Idaho. The area is surrounded on three sides by mountain ranges, the Tetons and Centennials to the north and east and the Beaverhead, Lemhi and Lost River ranges to the west and northwest.

The Refuge contains 10,578 acres with about 60 percent being various wetland types, ranging from sub-irrigated meadows to open water lakes. The Refuge is a wet meadow complex that is heavily dependent upon the perched ground water aquifer. Camas National Wildlife Refuge still provides quality habitat for more than 300 species of birds and various mammals, reptiles, amphibians, common to western sagebrush-steppe, meadow and riparian environments.

Visitation to Camas NWR appears to be on the increase and last year was approximated at 7,000 visitors. Two years ago, a group of volunteers began leading environmental education tours of the Refuge and were able to bring 250 students to explore and learn on a National Wildlife Refuge in the first year of the program. Photography continues to be one of the biggest uses of the Refuge. Many photographers from the Idaho Falls area make regular trips to the Refuge for year-round chances at photographing wildlife in a natural setting.

Area Economy

Camas NWR is located in southeastern Idaho.
Table 1-1 shows the area economy. The area population increased by 28 percent from 2001 to 2011, compared with a 20 percent increase for Idaho and a 9 percent increase for the U.S. as a whole. Area employment increased by 21 percent from 2001 to 2011, with Idaho showing a 12 percent increase and the U.S. a 6 percent increase. Area per capita income increased by 6 percent over the 2001-2011 period, while Idaho and the U.S. increased by 1 and 5 percent respectively.

Table 1-1. Camas NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Bonneville ID	105.8	26%	59.9	21%	$34,989	7%
Jefferson ID	26.3	36%	10.1	26%	$27,612	7%
Area Total	**132.1**	**28%**	**70.1**	**21%**	**$33,520**	**6%**
Idaho	1,585.0	20%	878.8	12%	$32,881	1%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 1-2 shows the recreation visits for Camas NWR. The Refuge had 6,763 visits in 2011. Nearly all of the visits were for non-consumptive recreation with residents accounting for 80 percent of all visits.

Table 1-2. Camas NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	900	100	1,000
Auto Tour	1,875	625	2,500
Boat Trail/Launch	0	0	0
Bicycle	150	0	150
Interpretation	190	10	200
Photography	2,000	500	2,500
Other Recreation	300	100	400
Hunting:			
Big Game	0	0	0
Small Game	6	2	8
Migratory Birds	5	0	5
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	**5,426**	**1,337**	**6,763**

Regional Economic Analysis

The economic areas for the Refuge are the counties of Bonneville and Jefferson in Idaho. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2011 are shown in Table 1-3. Total expenditures were $198,900 with non-residents accounting for $117,000 or 59 percent of total expenditures. Expenditures on non-consumptive activities accounted for almost all of the expenditures.

Table 1-4 summarizes the local economic effects associated with recreation visits. Final demand totaled $249,900 with associated employment of 2 jobs, $68,400 in employment income and $31,600 in total tax revenue.

Table 1-3. Camas NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:	$81.7	$116.9	$198.6
Hunting:	$0.2	$0.1	$0.3
Fishing:	—	—	—
Total Expenditures	**$81.9**	**$117.0**	**$198.9**

Table 1-4. Camas NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$103.0	$147.0	$249.9
Jobs	1	1	2
Job Income	$29.2	$39.2	$68.4
Total Tax Revenue	$13.8	$17.8	$31.6

Table 1-5 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 1-5. Camas NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Camas NWR	NA	$198.9	$197.8	$396.7

Columbia National Wildlife Refuge

Description

Located in the spectacular Columbia Basin in eastern Washington, Columbia National Wildlife Refuge is a scenic mixture of rugged cliffs, canyons, lakes, and arid sagebrush grasslands that attract migrating and wintering waterfowl, sandhill cranes, neotropical migrants, and nesting birds.

The refuge's setting is the geological area known as the Channeled Scablands - an area formed when great glacial floods gouged through basalt layers, leaving distinctive canyons or "channels," rocky buttes, and cliffs. This area, known as the Drumheller Channels, was designated a National Natural Landmark in 1986.

The public use program supports wildlife-oriented activities such as hiking, wildlife viewing/photography, hunting, fishing, boating, and environmental education. The Washington Department of Fish and Wildlife manages the refuge's fisheries under an approved management plan. In addition, the refuge co-hosts the annual spring Othello Sandhill Crane Festival, together with the community of Othello and other cooperators.

Area Economy

Columbia NWR is located in southeastern Washington. Table 1-6 shows the area economy. The area population increased by 27 percent from 2001 to 2011, compared with a 14 percent increase for Washington and a 9 percent increase for the U.S. as a whole. Area employment increased by 20 percent from 2001 to 2011, with Washington showing a 9 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 10 percent over the 2001-2011 period, while Washington and the U.S. both increased by 5 percent.

Table 1-6. Columbia NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Adams WA	19.0	17%	8.9	0%	$31,704	11%
Benton WA	180.7	24%	100.2	26%	$39,700	8%
Franklin WA	83.5	65%	35.2	34%	$29,711	9%
Grant WA	91.3	20%	42.3	10%	$30,999	11%
Okanogan WA	41.4	6%	23.7	10%	$35,409	26%
Area Total	**415.8**	**27%**	**210.3**	**20%**	**$34,992**	**10%**
Washington	6,830.0	14%	3,828.6	9%	$43,878	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 1-2 shows the recreation visits for Columbia NWR. The Refuge had 51,873 visits in 2011. Non-consumptive use accounted for 77 percent of all visits, fishing for 19 percent and hunting for 4 percent. Residents accounted for 39 percent of all visits to the Refuge.

Table 1-7. Columbia NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	1,500	1,500	3,000
Auto Tour	10,500	24,500	35,000
Boat Trail/Launch	600	400	1,000
Bicycle	4	4	7
Interpretation	163	163	326
Photography	150	150	300
Other Recreation	70	30	100
Hunting:			
Big Game	154	66	220
Small Game	350	150	500
Migratory Birds	994	426	1,420
Fishing:			
Freshwater	6,000	4,000	10,000
Saltwater	0	0	0
Total Visitation	**20,485**	**31,389**	**51,873**

Regional Economic Analysis

The economic area for the Refuge is Adams, Benton, Franklin, Grant, and Okanogan Counties in Washington. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 1-8. Total expenditures were $1.6 million with non-residents accounting for $1.3 million or 85 percent of total expenditures. Expenditures on non-consumptive activities accounted for 77 percent of all expenditures, followed by fishing with 16 percent.

Table 1-9 summarizes the local economic effects associated with recreation visits. Final demand totaled $2.0 million with associated employment of 16 jobs, $585,200 in employment income and $243,700 in total tax revenue.

Table 1-8. Columbia NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$97.4	$1,111.7	$1,209.1
Hunting	$49.7	$57.6	$107.3
Fishing	$96.1	$158.8	$254.9
Total Expenditures	**$243.1**	**$1,328.1**	**$1,571.2**

Table 1-9. Columbia NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$310.6	$1,726.0	$2,036.6
Jobs	3	13	16
Job Income	$90.7	$494.5	$585.2
Total Tax Revenue	$40.8	$202.9	$243.7

Table 1-10 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 1-10. Columbia NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Columbia NWR	NA	$1,571.2	$919.6	$2,490.8

Conboy Lake National Wildlife Refuge

Description

Conboy Lake National Wildlife Refuge's lush seasonal marshes and vibrant forested uplands gleam at the base of the splendid, snow-capped Mount Adams. Camas and buttercup blossoms sway across a wet meadow canvas with vibrant colors during spring. The trumpeting of sandhill cranes echoes throughout the Refuge as they descend upon their home. This living system continues to satisfy a longing for splendor and serenity as it did for indigenous peoples, explorers, loggers, and ranchers who were first drawn to the valley's plentiful resources.

A blend of pine, oak and aspen forests, wetlands, grassy prairies and streams supports a diverse and plentiful wildlife community. The rich habitat diversity sustains thriving populations of rare plants, migrating and breeding waterfowl and songbirds. The rare Oregon spotted frog breeds in wetlands throughout the refuge. Elk are plentiful and frequently seen along refuge roads. And Conboy Lake supports the only breeding population of greater sandhill cranes in Washington, nearly 27 pairs.

Conboy Lake National Wildlife Refuge is being 'discovered' by those seeking diverse scenery, idyllic recreational opportunities and a link to the history and living natural heritage of the Northwest. Conboy Lake provides inspiring wildlife dependent recreation opportunities for visitors, including wildlife observation, photography, environmental education, hunting, and fishing. Visitors develop a greater understanding and appreciation for the mission of the National Wildlife Refuge System and refuge management programs and for the importance of protecting lands for wildlife conservation.

Area Economy

Conboy Lake NWR is located in southwestern Washington. Table 1-11 shows the area economy. The area population increased by 15 percent from 2001 to 2011, compared with a 12 and 14 percent increases respectively for Oregon and Washington and a 9 percent increase for the U.S. as a whole. Area employment increased by 7 percent from 2001 to 2011, with Oregon and Washington showing a 6 and 9 percent increase respectively and the U.S. a 6 percent increase. Area per capita income decreased by 3 percent over the 2001-2011 period, while Oregon and Washington, and the U.S. increased by 1, 5 and 5 percent respectively.

Table 1-11. Conboy Lake NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Hood River OR	22.5	10%	15.9	20%	$35,441	17%
Multnomah OR	748.0	12%	577.2	5%	$41,658	-4%
Clark WA	433.4	21%	183.7	15%	$37,695	-3%
Klickitat WA	20.7	8%	10.7	19%	$38,529	28%
Area Total	**1,224.6**	**15%**	**787.5**	**7%**	**$40,088**	**-3%**
Oregon	3,871.9	12%	2,221.8	6%	$37,527	1%
Washington	6,830.0	14%	3,828.6	9%	$43,878	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 1-2 shows the recreation visits for Conboy Lake NWR. The Refuge had 5,605 visits in 2011. Non-consumptive recreation accounted for 5,500 visits. Nonresidents comprised 69 percent of Refuge visits.

Table 1-12. Conboy Lake NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	750	1,750	2,500
Auto Tour	600	1,400	2,000
Boat Trail/Launch	0	0	0
Bicycle	0	0	0
Interpretation	0	0	0
Photography	300	700	1,000
Other Recreation	0	0	0
Hunting:			
Big Game	5	5	10
Small Game	0	0	0
Migratory Birds	38	38	75
Fishing:			
Freshwater	18	2	20
Saltwater	0	0	0
Total Visitation	**1,711**	**3,895**	**5,605**

Regional Economic Analysis

The economic area for the Refuge is Hood River and Multnomah Counties in Oregon and Clark and Klickitat Counties in Washington. It is assumed that visitor expenditures occur primarily within these two counties. Visitor recreation expenditures for 2011 are shown in Table 1-13. Total expenditures were $274,500 with non-residents accounting for $255,000 or 93 percent of total expenditures. Expenditures on non-consumptive activities accounted for 98 percent of all expenditures.

Table 1-14 summarizes the local economic effects associated with recreation visits. Final demand totaled $465,800 with associated employment of 4 jobs, $57,800 in employment income and $57,900 in total tax revenue.

Table 1-13. Conboy Lake NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$17.7	$251.1	$268.8
Hunting	$1.5	$3.8	$5.3
Fishing	$0.3	$0.1	$0.4
Total Expenditures	**$19.5**	**$255.0**	**$274.5**

Table 1-14. Conboy Lake NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$32.2	$433.6	$465.8
Jobs	1	3	4
Job Income	$13.1	$44.7	$57.8
Total Tax Revenue	$4.2	$53.7	$57.9

Table 1-15 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 1-15. Conboy Lake NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Conboy Lake NWR	NA	$274.5	$119.6	$394.1

Dungeness National Wildlife Refuge

Description

At Dungeness National Wildlife Refuge, one of the world's longest natural sand spits softens the rough sea waves to form a quiet bay and harbor rich in marine life. These calm waters and tideflats provide wildlife protection from winds and pounding surf and a place to rest and feed. Eelgrass beds supply food for large flocks of brant and create a nursery for young salmon and steelhead. Refuge tideflats teem with migrating shorebirds in spring and fall while an impressive diversity of waterfowl congregate in the tranquil waters throughout the winter. Recognizing the area's importance to wildlife, President Woodrow Wilson declared Dungeness Spit and its surrounding waters a national wildlife refuge in 1915.

The refuge provides habitat for a wide diversity of wildlife including 244 species of birds, 28 species of mammals, 8 species of reptiles and amphibians, and 26 species of fish. Up to 5,000 black brant stage in the area during April. Shorebirds and water birds feed and rest along the water's edge; and about 600 harbor seals haul out to rest and have their pups on the end of Dungeness and Graveyard Spits.

Area Economy

Dungeness NWR is located in Clallam County on the northern coast of the Olympic Peninsula in Washington. Table 1-16 shows the county economy. The county population increased by 11 percent from 2001 to 2011, compared with a 14 percent increase for Washington and a 9 percent increase for the U.S. as a whole. County employment increased by 9 percent from 2001 to 2011, with Washington showing a 9 percent increase and the U.S. a 6 percent increase. Per capita income in Clallam County increased by 6 percent over the 2001-2011 period, while Washington and the U.S. both increased by 5 percent.

Table 1-16. Dungeness NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Clallam, WA	71.8	11%	35.0	9%	$36,138	6%
Washington	6,830.0	14%	3,828.6	9%	$43,878	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 1-17 shows the recreation visits for Dungeness NWR. The Refuge had 111,628 visits in 2011. Almost all of the visits were for non-consumptive recreation with residents accounting for 65 percent of all visits.

Table 1-17. Dungeness NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	41,029	22,093	63,122
Auto Tour	0	0	0
Boat Trail/Launch	153	153	306
Bicycle	0	0	0
Interpretation	30,875	16,625	47,500
Photography	125	125	250
Other Recreation	113	38	150
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	0	0	0
Saltwater	240	60	300
Total Visitation	**72,535**	**39,093**	**111,628**

Regional Economic Analysis

The economic area for the Refuge is Clallam County in Washington. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2011 are shown in Table 1-18. Total expenditures were over $1.9 million with non-residents accounting for $1.5 million or 77 percent of total expenditures. Expenditures on non-consumptive activities accounted for almost all visitor expenditures.

Table 1-19 summarizes the local economic effects associated with recreation visits. Final demand totaled $2.8 million with associated employment of 25 jobs, $860,600 in employment income and $323,700 in total tax revenue.

Table 1-18. Dungeness NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$461.8	$1,515.3	$1,977.1
Hunting	$0.0	$0.0	$0.0
Fishing	$3.9	$2.3	$6.2
Total Expenditures	**$465.7**	**$1,517.6**	**$1,983.3**

Table 1-19. Dungeness NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$674.2	$2,127.8	$2,802.0
Jobs	6	19	25
Job Income	$198.7	$661.9	$860.6
Total Tax Revenue	$80.7	$243.0	$323.7

Table 1-20 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2006. The $7.02 means that for every $1 of budget expenditures, $7.02 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 1-20. Dungeness NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Dungeness NWR	$2,880.7	$14,984.2	$5,242.1	$7.02

Hanford Reach National Monument

Description

The Hanford Reach National Monument is approximately 196,000 acres of biologically diverse landscape, embracing a remarkable natural and historic legacy. The Hanford Reach, the last free-flowing non-tidal stretch of the Columbia River, is the ribbon that weaves shrub-steppe and riverine communities together, defining an irreplaceable landscape—a place to discover the richness of life, to reflect upon history, and to experience nature in solitude.

The Monument's diversity of plants and wildlife are critical to the biological integrity of the Columbia Basin. The unique combination of an expansive and increasingly rare shrub-steppe ecosystem, the free-flowing river, and the last major salmon spawning grounds in the Columbia River create a diverse and precious mosaic of habitats. The Monument is a refuge for a multitude of species, some new to science.

The Monument is a natural gathering place to learn, to experience and celebrate cultures, where stories are protected and passed on. Its history of immigrant settlement and the dawning of the atomic era is acknowledged, as well as its continuing physical and spiritual sustenance for Native Americans.

The Monument is a testimonial to the past and the sacrifices of our ancestors. The Monument is also a vision into the future where visitors, neighbors and partners are valued and respected; where natural and historic resources are protected; and where all may come to experience the Monument and its magnificent resources.

The Monument located in south central Washington has portions in Adams, Benton, Franklin and Grant counties. The Tri-Cities area of Washington with a population of over 250,000 provides the primary source of visitors, but visitors also come from the large metropolitan areas of Washington and Oregon for the unique habitats and the river.

Area Economy

Hanford Reach National Monument is located in southeastern Washington. Table 1-21 shows the area economy. The area population increased by 30 percent from 2001 to 2011, compared with a 14 percent increase for Washington and a 9 percent increase for the U.S. as a whole. Area employment increased by 22 percent from 2001 to 2011, with Washington showing a 9 percent increase and the U.S. a 6 percent increase. Area per capita income increased by 8 percent over the 2001-2011 period, while Washington and the U.S. both increased by 5 percent.

Table 1-21. Hanford Reach National Monument: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Adams WA	19.0	17%	8.9	0%	$31,704	10.89%
Benton WA	180.7	24%	100.2	26%	$39,700	8.30%
Franklin WA	83.5	65%	35.2	34%	$29,711	8.83%
Grant WA	91.3	20%	42.3	10%	$30,999	11.32%
Area Total	**374.4**	**30%**	**186.6**	**22%**	**$34,946**	**8%**
Washington	6,830.0	14%	3,828.6	9%	$43,878	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 1-22 shows the recreation visits for Hanford Reach National Monument. The Refuge had 33,925 recreational visits in 2011. Fishing visits comprised 59 percent of all visits. The majority of visitors were residents (63 percent).

Table 1-22. Hanford Reach National Monument: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	3,500	1,500	5,000
Auto Tour	0	0	0
Boat Trail/Launch	1,800	1,200	3,000
Bicycle	0	0	0
Interpretation	0	0	0
Photography	70	30	100
Other Recreation	3,500	1,500	5,000
Hunting:			
Big Game	60	15	75
Small Game	240	60	300
Migratory Birds	360	90	450
Fishing:			
Freshwater	12,000	8,000	20,000
Saltwater	0	0	0
Total Visitation	**21,530**	**12,395**	**33,925**

Regional Economic Analysis

The economic area for the Refuge is Adams, Benton, Franklin, and Grant Counties in Washington . It is assumed that visitor expenditures occur primarily within these areas. Visitor recreation expenditures for 2011 are shown in Table 1-23. Total expenditures were $1.6 million with non-residents accounting for $1.1 million or 67 percent of total expenditures. Expenditures on fishing activities accounted for 63 percent of all expenditures

Table 1-24 summarizes the local economic effects associated with recreation visits. Final demand totaled $2.0 million with associated employment of 17 jobs, $593,300 in employment income and $258,400 in total tax revenue.

Table 1-23. Hanford Reach National Monument: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$136.3	$421.1	$557.4
Hunting	$17.0	$12.4	$29.4
Fishing	$384.3	$635.2	$1,019.5
Total Expenditures	**$537.6**	**$1,068.7**	**$1,606.3**

Table 1-24. Hanford Reach National Monument: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$683.1	$1,331.5	$2,014.6
Jobs	6	10	17
Job Income	$203.2	$390.1	$593.3
Total Tax Revenue	$92.6	$165.8	$258.4

Table 1-25 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 1-25. Hanford Reach National Monument: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Hanford Reach National Monument	NA	$1,606.3	$1,542.3	$3,148.6

Hart Mountain National Antelope Refuge

Description

Hart Mountain National Antelope Refuge (NAR) located in southeast Lake County, Oregon was established in 1936 as a range for remnant herds of American pronghorn. Since that time management of the Refuge has broadened to include conservation of all wildlife species characteristic of this high desert habitat and restoration of native ecosystems for the public's enjoyment, education, and appreciation.

The west side of the Refuge lies along a massive fault block ridge that ascends abruptly nearly three-quarters of a mile above the Warner Valley floor in a series of rugged cliffs, steep slopes, and knife-like ridges.

Visitors experience spectacular views of the beautiful Warner Valley wetlands while ascending the west side entrance road to the Refuge headquarters. The west face of the mountain is cut by Hart, Potter, DeGarmo, and other canyons, the most rugged of which extend from the valley floor to the top of the main ridge.

The east side of the Refuge is less precipitous, descending in a series of rolling hills and low ridges of sagebrush grasslands typical of southeastern Oregon and the northen Great Basin.

The rugged diversity of the terrain creates a rich mix of habitat types, home to more than 300 species of wildlife. Featured species include American pronghorn , California bighorn sheep, mule deer, sage grouse, and redband trout. The 278,000-acre Refuge is one of the most expansive wildlife habitats in the arid west free of domestic livestock.

Area Economy

Hart Mountain NAR is located in south-central Oregon. Table 1-26 shows the area economy. The area population increased by 30 percent from 2001 to 2011, compared with a 12 percent increase for Oregon and a 9 percent increase for the U.S. as a whole. Area employment increased by 17 percent from 2001 to 2011, with Oregon showing a 6 percent increase and the U.S. a 6 percent increase. Area per capita income increased by 2 percent over the 2001-2011 period, while Oregon and the U.S. increased by 1 and 5 percent respectively.

Table 1-26. Hart Mountain NAR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Deschutes OR	160.3	33%	92.4	19%	$37,084	1%
Harney OR	7.4	-2%	4.2	3%	$28,862	3%
Lake OR	7.9	5%	4.2	-4%	$32,193	6%
Area Total	**175.6**	**30%**	**100.8**	**17%**	**$36,519**	**2%**
Oregon	3,871.9	12%	2,221.8	6%	$37,527	1%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 1-27 shows the recreation visits for Hart Mountain NAR. The Refuge had 14,962 recreational visits in 2011. Non-consumptive recreation totaled 76 percent of all recreation visits. The majority of visitors were residents (74 percent).

Table 1-27. Hart Mountain NAR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	299	128	427
Auto Tour	3,150	1,350	4,500
Boat Trail/Launch	0	0	0
Bicycle	0	0	0
Interpretation	490	210	700
Photography	77	33	110
Other Recreation	3,990	1,710	5,700
Hunting:			
Big Game	2,155	239	2,394
Small Game	451	24	475
Migratory Birds	0	0	0
Fishing:			
Freshwater	525	131	656
Saltwater	0	0	0
Total Visitation	**11,137**	**3,825**	**14,962**

Regional Economic Analysis

The economic area for the Refuge includes the Deschutes, Harney, and Lake Counties in Oregon. It is assumed that visitor expenditures occur primarily within these areas. Visitor recreation expenditures for 2011 are shown in Table 1-28. Total expenditures were nearly $795,600 with non-residents accounting for $514,200 or 65 percent of total expenditures. Expenditures on non-consumptive activities accounted for 79 percent of all expenditures

Table 1-29 summarizes the local economic effects associated with recreation visits. Final demand totaled $942,300 million with associated employment of 10 jobs, $325,400 in employment income and $152,200 in total tax revenue.

Table 1-28. Hart Mountain NAR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$175.3	$456.0	$631.3
Hunting	$93.6	$50.3	$143.9
Fishing	$12.6	$7.8	$20.4
Total Expenditures	**$281.4**	**$514.2**	**$795.6**

Table 1-29. Hart Mountain NAR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$428.1	$514.2	$942.3
Jobs	4	6	10
Job Income	$124.7	$200.8	$325.4
Total Tax Revenue	$60.2	$92.0	$152.2

Table 1-30 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 1-30. Hart Mountain NAR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Hart Mountain NAR	NA	$795.6	$676.1	$1,471.7

Kootenai National Wildlife Refuge

Description

Kootenai National Wildlife Refuge is located in Idaho's Panhandle approximately 20 miles south of the Canadian border and 5 miles west of Bonners Ferry, Idaho. This 2,774-acre refuge was established in 1965, primarily to provide important habitat and a resting area for migrating waterfowl. The Refuge is comprised of a wide variety of habitat types. Wetlands, meadows, riparian forests and cultivated agricultural fields (for producing wildlife food crops) are interspersed in the valley bottom adjacent to the west banks of the Kootenai River. Wetlands include open-water ponds, seasonal cattail-bulrush marshes, tree-lined ponds and rushing creeks. The western portion of the refuge ascends the coniferous-forest clad foothills of the scenic Selkirk Mountains.

Over 300 different species of wildlife occur on Kootenai National Wildlife Refuge, indicating the richness and diversity this area holds. The refuge not only serves as valuable habitat for resident and migratory wildlife, but also provides a nice stopping point for visitors to get out and enjoy some of the vast natural beauty Boundary County has to offer. The refuge receives more than 50,000 visitors annually due in part to the growing popularity of the scenic 280-mile drive – the International Selkirk Loop.

Area Economy

Kootenai NWR is located in northern Idaho near the Canadian border. Table 1-31 shows the area economy. The area population increased by 10 percent from 2001 to 2011, compared with a 20 percent increase for Idaho and a 9 percent increase for the U.S. as a whole. Area employment increased by 10 percent from 2001 to 2011, with Idaho showing a 12 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 8 percent over the 2001-2011 period, while Idaho and the U.S. increased by 1 and 5 percent respectively.

Table 1-31. Kootenai NWR:
Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Boundary ID	10.8	10%	5.6	10%	$14,135	8%
Idaho	1,585.0	20%	878.8	12%	$32,881	1%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 1-2 shows the recreation visits for Kootenai NWR. The Refuge had 94,952 visits in 2011. Non-consumptive recreation accounted for 94,372 visits, hunting 550 visits, and fishing 30 visits. Residents comprised 79 percent of all Refuge visits.

Table 1-32. Kootenai NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	38,000	2,000	40,000
Auto Tour	8,299	5,533	13,832
Boat Trail/Launch	0	0	0
Bicycle	7,735	1,365	9,100
Interpretation	352	88	440
Photography	3,000	3,000	6,000
Other Recreation	17,500	7,500	25,000
Hunting:			
Big Game	225	75	300
Small Game	100	0	100
Migratory Birds	98	53	150
Fishing:			
Freshwater	9	21	30
Saltwater	0	0	0
Total Visitation	**75,318**	**19,634**	**94,952**

Regional Economic Analysis

The economic area for the Refuge is Boundary County, Idaho. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2011 are shown in Table 1-33. Total expenditures were $1.5 million with non-residents accounting for $926,200 or 63 percent of total expenditures. Expenditures on non-consumptive activities accounted for 98 percent of all expenditures.

Table 1-34 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.3 million with associated employment of 15 jobs, $386,200 in employment income and $163,700 in total tax revenue.

Table 1-33. Kootenai NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$528.0	$911.8	$1,439.8
Hunting	$9.5	$14.2	$23.7
Fishing	$0.0	$0.2	$0.2
Total Expenditures	**$537.5**	**$926.2**	**$1,463.7**

Table 1-34. Kootenai NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$512.7	$813.3	$1,325.9
Jobs	6	9	15
Job Income	$149.2	$237.0	$386.2
Total Tax Revenue	$65.4	$98.2	$163.7

Table 1-35 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 1-35. Kootenai NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Kootenai NWR	NA	$1,463.7	$1,344.1	$2,807.8

Little Pend Oreille National Wildlife Refuge

Description

Located on the west slope of the Selkirk Mountain Range in northeastern Washington, Little Pend Oreille National Wildlife Refuge is the only mountainous, mixed-conifer forest refuge outside of Alaska. The refuge's 42,594 acres protect a wide range of forest types from low elevation ponderosa pine to high elevation subalpine fir.

These forests provide important habitats for hundreds of species of birds, mammals, reptiles, and amphibians, including neotropical migratory songbirds, forest carnivores and ungulates, and the threatened Canada lynx. Refuge lands provide protection for wide-ranging species that require large tracts of forest habitat including critical winter range for white-tailed deer.

Refuge lakes and marshes provide stopover points for migratory waterfowl and shorebirds. Three other units of Little Pend Oreille Refuge, including Cusick Flats (255 acres), Springdale (54 acres) and Kaniksu (716 acres), are managed from this station. About 50,000+ visitors enjoy the refuge each year. Hunting, fishing, wildlife viewing, hiking, camping, and horseback riding are the most popular recreational activities.

Area Economy

Little Pend Oreille NWR is located in northeastern Washington. Table 1-36 shows the area economy. The area population increased by 12 percent from 2001 to 2011, compared with a 14 percent increase for Washington and a 9 percent increase for the U.S. as a whole. Area employment increased by 7 percent from 2001 to 2011, with Washington showing a 9 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 5 percent over the 2001-2011 period, while Washington and the U.S. both increased by 5 percent.

Table 1-36. Little Pend Oreille NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Spokane, WA	473.8	12%	264.7	7%	$35,940	5%
Stevens, WA	43.5	8%	15.4	-1%	$28,559	7%
Area Total	**517.3**	**12%**	**280.1**	**7%**	**$35,319**	**5%**
Washington	6,830.0	14%	3,828.6	9%	$43,878	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 1-37 shows the recreation visits for Little Pend Oreille NWR. The Refuge had 64,130 visits in 2011. Non-consumptive recreation accounted for 45,120 visits, hunting 14,010 visits, and fishing 5,000 visits. Residents comprised 64 percent of all Refuge visits.

Table 1-37. Little Pend Oreille NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	420	180	600
Auto Tour	14,400	9,600	24,000
Boat Trail/Launch	0	0	0
Bicycle	240	60	300
Interpretation	96	24	120
Photography	60	40	100
Other Recreation	14,000	6,000	20,000
Hunting:			
Big Game	7,200	4,800	12,000
Small Game	1,500	500	2,000
Migratory Birds	10	0	10
Fishing:			
Freshwater	3,000	2,000	5,000
Saltwater	0	0	0
Total Visitation	**40,926**	**23,204**	**64,130**

Regional Economic Analysis

The economic area for the Refuge is Spokane and Stevens Counties in Washington. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 1-38. Total expenditures were $2.2 million with non-residents accounting for $1.7 million or 75 percent of total expenditures. Expenditures on non-consumptive activities accounted for 52 percent of all expenditures, followed by hunting and fishing at 44 and 4 percent respectively.

Table 1-39 summarizes the local economic effects associated with recreation visits. Final demand totaled $3.9 million with associated employment of 30 jobs, $1.2 million in employment income and $468,000 in total tax revenue.

Table 1-38. Little Pend Oreille NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$278.9	$855.7	$1,134.7
Hunting	$224.9	$741.2	$966.1
Fishing	$36.0	$59.5	$95.6
Total Expenditures	**$539.8**	**$1,656.5**	**$2,196.4**

Table 1-39. Little Pend Oreille NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$974.8	$2,907.9	$3,882.7
Jobs	8	22	30
Job Income	$291.7	$870.1	$1,161.8
Total Tax Revenue	$120.2	$347.8	$468.0

Table 1-40 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 1-40. Little Pend Oreille NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Little Pend Oreille NWR	NA	$2,196.4	$1,466.3	$3,662.7

Malheur National Wildlife Refuge

Description

Malheur National Wildlife Refuge, established in 1908, is located in southeastern Oregon on the northern edge of the Great Basin. It is adjacent to the newly established Steens Mountain Wilderness, with the Wild and Scenic Donner and Blitzen (thunder and lightning) River flowing into the refuge at its southern boundary.

Malheur Refuge consists of more than 185,000 acres of prime wildlife habitat, including 120,000 acres of a wetland wonder in a sea of sagebrush. Malheur is a mecca for birdwatchers and wildlife enthusiasts. More than 320 species of birds, 58 species of mammals, 10 species of native fish, and a number of reptiles can be found on the refuge.

Spring is the most spectacular season at Malheur. More than 130 species of birds nest on the refuge, while other waterfowl using the Pacific Flyway stop at the refuge to refuel for their journey northward. In February, northern pintail and tundra swan begin to arrive, followed by large flocks of lesser and greater sandhill crane, and flocks of snow goose and Ross' goose.

With more than 320 species of birds and 58 species of mammals, the refuge offers prime wildlife viewing, hunting, and fishing.

Area Economy

Malheur NWR is located in Haney County in southeastern Oregon. Table 1-41 shows the area economy. The county population decreased by 2 percent from 2001 to 2011, compared with a 12 percent increase for Oregon and a 9 percent increase for the U.S. as a whole. County employment increased by 3 percent from 2001 to 2011, with Oregon showing a 6 percent increase and the U.S. a 6 percent increase. Per capita income in Haney County increased by 3 percent over the 2001-2011 period, while Oregon and the U.S. increased by 1 and 5 percent respectively.

Table 1-41. Malheur NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Harney OR	7.4	-2%	4.2	3%	$28,862	3%
Oregon	3,871.9	12%	2,221.8	6%	$37,527	1%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 1-42 shows the recreation visits for Malheur NWR. The Refuge had 119,075 visits in 2011. The majority of visits were for non-consumptive activities (111,300 visits).

Table 1-42. Malheur NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	1,120	26,880	28,000
Auto Tour	2,440	58,560	61,000
Boat Trail/Launch	80	1,920	2,000
Bicycle	120	2,880	3,000
Interpretation	272	6,528	6,800
Photography	400	9,600	10,000
Other Recreation	0	500	500
Hunting:			
Big Game	20	20	40
Small Game	425	425	850
Migratory Birds	77	9	85
Fishing:			
Freshwater	3,400	3,400	6,800
Saltwater	0	0	0
Total Visitation	**8,354**	**110,722**	**119,075**

Regional Economic Analysis

The economic area for the Refuge is Harney County, Oregon. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2011 are shown in Table 1-43. Total expenditures were about $15.0 million with non-residents accounting for $14.8 million or 99 percent of total expenditures. Expenditures on non-consumptive activities accounted for 97 percent of all visitor expenditures.

Table 1-44 summarizes the local economic effects associated with recreation visits. Final demand totaled $13.4 million with associated employment of 140 jobs, $1.2 million in employment income and $1.7 million in total tax revenue.

Table 1-43. Malheur NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$99.1	$14,504.2	$14,603.2
Hunting	$10.3	$39.1	$49.4
Fishing	$95.3	$236.2	$331.5
Total Expenditures	**$204.7**	**$14,779.5**	**$14,984.2**

Table 1-44. Malheur NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$185.9	$13,213.6	$13,399.5
Jobs	3	137	140
Job Income	$291.7	$870.1	$1,161.8
Total Tax Revenue	$25.9	$1,658.3	$1,684.2

Table 1-45 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $7.02 means that for every $1 of budget expenditures, $7.02 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 1-45. Malheur NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Malheur NWR	$2,880.7	$14,984.2	$5,242.1	$7.02

McNary National Wildlife Refuge

Description

Stretching along the river bend where the waters of the Snake and Walla Walla Rivers join the Columbia River, the McNary National Wildlife Refuge links a network of diverse habitats stretching dozens of miles. The Refuge's shrub-steppe, basalt cliff, riparian, river islands and aquatic habitats are managed to fulfill the needs of native fish, wildlife, and plants. By actively restoring habitat, controlling exotic species, and enhancing existing habitats and resources, the Refuge serves as an anchor for biodiversity and a model for habitat restoration and land management.

Just as the Columbia River is an important corridor for the transportation of people and goods, it is also an important natural corridor for migratory birds and fish, including endangered salmon and steelhead stocks. Food, rest and sanctuary are provided for large concentrations of migratory and wintering waterfowl and shorebirds using the Refuge each year.

Wildlife abundance and a close proximity to one of the fastest growing communities in Washington State (the Tri-Cities) attract thousands of visitors to the Refuge every year. Many of these visitors are waterfowl hunters and anglers or wildlife watchers. During the spring season, thousands of elementary students participate in environmental education programs on the Refuge.

Area Economy

McNary NWR is located in southeastern Washington on the Columbia River. Table 1-46 shows the area economy. The area population increased by 25 percent from 2001 to 2011, compared with a 12 and 14 percent increase for Oregon and Washington, and a 9 percent increase for the U.S. as a whole. Area employment increased by 13 percent from 2001 to 2011, with Oregon and Washington showing a 6 and 9 percent increase respectively, and the U.S. a 6 percent increase. Per capita income in the area increased by 7 percent over the 2001-2011 period, while Oregon and Washington, and the U.S. increased by 1, 5 and 5 percent respectively.

Table 1-46. McNary NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Umatilla OR	76.7	9%	38.8	2%	$30,701	4%
Franklin WA	83.5	65%	35.2	34%	$29,711	9%
Walla Walla WA	59.6	8%	33.9	7%	$35,276	11%
Area Total	**219.8**	**25%**	**107.9**	**13%**	**$31,566**	**7%**
Oregon	3,871.9	12%	2,221.8	6%	$37,527	1%
Washington	6,830.0	14%	3,828.6	9%	$43,878	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 1-47 shows the recreation visits for McNary NWR. The Refuge had 42,095 visits in 2011. Non-consumptive recreation accounted for 10,495 visits, or 25 percent of all visits. Fishing accounted for 15,600 visits or 37 percent of all visits and hunting accounted for 16,000 visits or 38 percent of Refuge visits. Residents accounted for 83 percent of all Refuge visits.

Table 1-47. McNary NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	1,400	600	2,000
Auto Tour	0	0	0
Boat Trail/Launch	1,800	200	2,000
Bicycle	0	0	0
Interpretation	446	50	495
Photography	600	400	1,000
Other Recreation	3,500	1,500	5,000
Hunting:			
Big Game	90	10	100
Small Game	1,260	140	1,400
Migratory Birds	11,280	2,820	14,100
Fishing:			
Freshwater	14,400	1,600	16,000
Saltwater	0	0	0
Total Visitation	**34,776**	**7,320**	**42,095**

Regional Economic Analysis

The economic area for the Refuge consists of Franklin and Walla Walla counties in Washington and Umatilla county in Oregon. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2011 are shown in Table 1-48. Total expenditures were $1.3 million with residents accounting for $817,200 or 61 percent of total expenditures. Non-resident expenditures were $526,900 or 39 percent of visitation expenditures. Expenditures on hunting activities accounted for 49 percent of all expenditures, followed by fishing and non-consumptive activities at 27 and 24 percent respectively.

Table 1-48. McNary NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$104.5	$208.4	$312.9
Hunting	$424.4	$239.1	$663.5
Fishing	$288.3	$79.4	$367.6
Total Expenditures	**$817.2**	**$526.9**	**$1,344.1**

Table 1-49 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.6 million with associated employment of 14 jobs, $442,300 in employment income and $203,300 in total tax revenue.

Table 1-49. McNary NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$963.8	$597.6	$1,561.4
Jobs	9	5	14
Job Income	$279.9	$162.4	$442.3
Total Tax Revenue	$131.4	$71.9	$203.3

Table 1-50 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 1-50. McNary NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
McNary NWR	NA	$1,344.1	$1,456.4	$2,800.5

Nisqually National Wildlife Refuge

Description

Nisqually National Wildlife Refuge is located where the freshwater of the Nisqually River meets the saltwater of south Puget Sound, creating the Nisqually River Delta. The delta is a biologically-rich and diverse area that supports a variety of habitats including the estuary, freshwater wetlands and riparian woodlands. It is considered the last unspoiled major estuary in Puget Sound. The Nisqually Delta has been designated as a National Natural Landmark because of its national significance as one of the best examples of this kind of coastal salt marsh system remaining in the North Pacific.

Nisqually Refuge is famous for the more than 291 migratory bird species that use the refuge for migration, wintering, or breeding. The refuge provides rearing and migration habitat for steelhead trout and several salmon species including the Federally listed Chinnok salmon. The Black River Unit, southwest of Olympia, provides high quality habitat for Coho salmon, cutthroat trout, migratory birds, and a diversity of other species. The Black River is one of the largest undisturbed freshwater wetland systems remaining in western Washington. Situated between Olympia and Seattle and within 100 miles of more than 4 million people, Nisqually Refuge is visited each year by more than 100,000 people who come to enjoy and learn about these sensitive natural resources. The refuge provides environmental education programs for over 6,000 school children every year.

Area Economy

Nisqually NWR is located on the southern area of the Puget Sound near Olympia, Washington. Table 1-51 shows the area economy. The area population increased by 15 percent from 2001 to 2011, compared with a 14 percent increase for Washington and a 9 percent increase for the U.S. as a whole. Area employment increased by 15 percent from 2001 to 2011, with Washington showing a 9 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 8 percent over the 2001-2011 period, while Washington and the U.S. both increased by 5 percent.

Table 1-51. Nisqually NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Pierce WA	807.9	13%	378.8	14%	$40,992	9%
Thurston WA	256.6	21%	129.3	16%	$41,251	4%
Area Total	**1,064.5**	**15%**	**508.0**	**15%**	**$41,054**	**8%**
Washington	6,830.0	14%	3,828.6	9%	$43,878	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 1-52 shows the recreation visits for Nisqually NWR. The Refuge had 203,815 visits in 2011. Almost all of the visits were for non-consumptive recreation, with residents accounting for 70 percent of visitation.

Table 1-52. Nisqually NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	122,920	52,680	175,600
Auto Tour	0	0	0
Boat Trail/Launch	3,500	1,500	5,000
Bicycle	0	0	0
Interpretation	1,204	516	1,720
Photography	12,292	5,268	17,560
Other Recreation	350	150	500
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	165	70	235
Fishing:			
Freshwater	0	0	0
Saltwater	2,240	960	3,200
Total Visitation	**142,671**	**61,144**	**203,815**

Regional Economic Analysis

The economic area for the Refuge consists of Pierce and Thurston Counties in Washington. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2011 are shown in Table 1-53. Total expenditures were $3.5 million with residents accounting for $1.0 million. Expenditures on non-consumptive activities accounted for 94 percent of all expenditures, with fishing accounting for 5 percent.

Table 1-53. Nisqually NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$908.2	$2,363.0	$3,271.2
Hunting	$5.0	$4.8	$9.8
Fishing	$92.0	$91.9	$183.8
Total Expenditures	**$1,005.1**	**$2,459.7**	**$3,464.9**

Table 1-54 summarizes the local economic effects associated with recreation visits. Final demand totaled $5.5 million with associated employment of 41 jobs, $587,500 in employment income and $702,800 in total tax revenue.

Table 1-54. Nisqually NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$1,581.7	$3,968.7	$5,549.6
Jobs	13	28	41
Job Income	$364.4	$217.5	$587.5
Total Tax Revenue	$201.1	$501.9	$702.8

Table 1-55 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 1-55. Nisqually NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Nisqually NWR	NA	$3,464.9	$2,655.7	$6,120.6

Ridgefield National Wildlife Refuge

Description

The Ridgefield National Wildlife Refuge (Refuge) was established in 1965, for the conservation of dusky Canada geese and other waterfowl. The Refuge currently manages 5,218 acres of marshes, grasslands and woodlands within the natural Columbia River flood plain. It is accessed from Ridgefield, Washington, three miles off Interstate 5 and within a 30 minute drive of six Washington and Oregon counties with a total population in excess of 2.1 million.

With its strategic position on the Columbia River, the area that would eventually become Ridgefield National Wildlife Refuge occupied an important fishing and trade route location that attracted early peoples. The region would later attract early British and American explorers, including the Lewis and Clark Expedition. The Refuge holds one of the few archeological sites on the Lower Columbia River that has withstood the ravages of flooding, looting, and development. The Refuge's rich history and cultural heritage is presented within the historical-representative Cathlapotle Plankhouse located on the Carty Unit and attracts thousands of visitors annually. The combination of the native ecosystem and cultural history within close proximity to a large urban audience affords a rare opportunity to provide quality wildlife and cultural oriented recreation, environmental education, and interpretation opportunities.

The Refuge enjoys significant support from the local community including city and county governments, businesses, non-profit groups, and the agricultural community, and attracts large numbers of regional visitors. Annual visitation averages 150,000 and approximately 3,600 students have visited the Cathlapotle Plankhouse since it opened in 2004. Overall annual visitation of the Refuge is rapidly growing.

Area Economy

Ridgefield NWR is located on the Columbia River in southwestern Washington. Table 1-56 shows the counties making up the area economy. The area population increased by 15 percent from 2001 to 2011, compared with a 12 and 14 percent increase for the states of Oregon and Washington, and a 9 percent increase for the U.S. as a whole. Area employment increased by 8 percent from 2001 to 2011, with Oregon and Washington showing a 6 and 9 percent increase respectively, and the U.S. a 6 percent increase. Per capita income in the area decreased by 2 percent over the 2001-2011 period, while Oregon increased by 1 percent and both Washington and the U.S. increased by 5 percent.

Table 1-56. Ridgefield NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Clackamas OR	380.2	11%	218.1	11%	$45,915	-1%
Multnomah OR	748.0	12%	577.2	5%	$41,658	-4%
Washington OR	540.4	17%	296.9	10%	$42,639	1%
Clark WA	433.4	21%	183.7	15%	$37,695	-3%
Area Total	**2,102.1**	**15%**	**1,275.9**	**8%**	**$41,863**	**-2%**
Oregon	3,871.9	12%	2,221.8	6%	$37,527	1%
Washington	6,830.0	14%	3,828.6	9%	$43,878	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 1-57 shows the recreation visits for Ridgefield NWR. The Refuge had 164,525 visits in 2011. The vast majority of visits were for non-consumptive activities. Residents accounted for 80 percent of all Refuge visitation.

Table 1-57. Ridgefield NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	41,322	10,331	51,653
Auto Tour	58,521	14,630	73,151
Boat Trail/Launch	0	0	0
Bicycle	0	0	0
Interpretation	6,169	2,056	8,225
Photography	23,600	5,900	29,500
Other Recreation	0	0	0
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	1,442	254	1,696
Fishing:			
Freshwater	300	0	300
Saltwater	0	0	0
Total Visitation	**131,354**	**33,171**	**164,525**

Regional Economic Analysis

The economic area for the Refuge is Clark County in Washington and Multnomah, Clackamas and Washington Counties in Oregon. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2011 are shown in Table 1-58. Total expenditures were $3.0 million with non-residents accounting for $1.8 million or 60 percent of total expenditures. Expenditures on non-consumptive activities accounted for 98 percent of all expenditures.

Table 1-59 summarizes the local economic effects associated with recreation visits. Final demand totaled $5.6 million with associated employment of 39 jobs, $1.7 in employment income and 758,700 in total tax revenue.

Table 1-58. Ridgefield NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$1,157.7	$1,787.1	$2,944.8
Hunting	$43.8	$17.4	$61.1
Fishing	$2.4	$0.0	$2.4
Total Expenditures	**$1,203.9**	**$1,804.4**	**$3,008.3**

Table 1-59. Ridgefield NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$2,221.4	$3,408.3	$5,629.7
Jobs	16	23	39
Job Income	$669.3	$1,012.9	$1,682.2
Total Tax Revenue	$307.4	$451.2	$758.7

Table 1-60 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2006. The $6.02 means that for every $1 of budget expenditures, $6.02 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 1-60. Ridgefield NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Ridgefield NWR	$981.2	$3,008.3	$2,901.9	$6.02

Sheldon National Wildlife Refuge

Description

Located in a remote area of northwestern Nevada, the Sheldon National Wildlife Refuge (Sheldon NWR) encompasses 575,000 acres of sagebrush-steppe habitat within the Great Basin. Originally established in 1931 for the conservation and protection of the once-imperiled American pronghorn, Sheldon NWR (along with its refuge complex companion Hart Mountain National Antelope Refuge) now conserves habitat for a number of additional native, rare, and imperiled species of fish, wildlife, and plants that depend upon the sagebrush-steppe ecosystem.

Blanketing high basalt tablelands and mountains, which average 6,000 feet in elevation, the vast expanses of sagebrush habitats are dotted with springs, pockets of aspen, and isolated stands of mountain mahogany. Only at its edges does the refuge vary noticeably, with the pale rhyolite of Virgin Valley on the eastern edge, which holds highly prized black opal, and the high escarpment on the western edge where western juniper dominates.

With the exception of a two-lane paved highway, a few scattered buildings, abandoned water troughs, and some primitive dirt roads, Sheldon Refuge appears today much as it has for the past 12,000 years or more that people have lived in this region. This long history of habitation is apparent throughout the refuge from the prehistoric stone tools, petroglyphs, and ancient campsites that remain. Today people continue to hunt, hike, and camp within Sheldon Refuge, but for recreation rather than subsistence.

Area Economy

Sheldon NWR is located in northwestern Nevada. Table 1-61 shows the area economy. The area population increased by 20 percent from 2001 to 2011, compared with a 30 and 12 percent increase for Nevada and Oregon, and a 9 percent increase for the U.S. as a whole. Area employment increased by 4 percent from 2001 to 2011, with Nevada and Oregon showing a 18 and 6 percent increase and the U.S. a 6 percent increase. Area per capita income decreased by 10 percent over the 2001-2011 period, while Nevada decreased by 6 percent and Oregon and the U.S. increased by 1 and 5 percent respectively.

Table 1-61. Sheldon NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Lake NV	16.7	10%	10.4	25%	$43,022	36%
Washoe NV	425.7	21%	244.8	4%	$41,790	-12%
Humboldt OR	7.9	5%	4.2	-4%	$32,193	6%
Area Total	**450.4**	**20%**	**259.5**	**4%**	**$41,667**	**-10%**
Nevada	2,723.3	30%	1,498.2	18%	$36,964	-6%
Oregon	3,871.9	12%	2,221.8	6%	$37,527	1%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 1-62 shows the recreation visits for Sheldon NWR**.** The Refuge had 35,929 visits in 2011. Non-consumptive recreation accounted for 34,500 visits, hunting for 1,299 visits, and fishing for 130 visits. Residents comprised 71 percent of all Refuge visits.

Table 1-62. Sheldon NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	3,500	1,500	5,000
Auto Tour	8,400	3,600	12,000
Boat Trail/Launch	0	0	0
Bicycle	0	0	0
Interpretation	140	60	200
Photography	210	90	300
Other Recreation	11,900	5,100	17,000
Hunting:			
Big Game	926	103	1,029
Small Game	238	13	250
Migratory Birds	19	1	20
Fishing:			
Freshwater	104	26	130
Saltwater	0	0	0
Total Visitation	**25,436**	**10,492**	**35,929**

Regional Economic Analysis

The economic area for the Refuge is Lake and Washoe Counties in Nevada and Humboldt County, Oregon . It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 1-63. Total expenditures were $905,000 with non-residents accounting for $628,400 or 69 percent of total expenditures. Expenditures on non-consumptive activities accounted for 93 percent of all expenditures, followed by hunting and fishing at 7 and less than 1 percent respectively.

Table 1-64 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.3 million with associated employment of 10 jobs, $395,500 in employment income and $167,000 in total tax revenue.

Table 1-63. Sheldon NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$232.5	$604.9	$837.4
Hunting	$41.6	$21.9	$63.6
Fishing	$2.5	$1.5	$4.0
Total Expenditures	**$276.6**	**$628.4**	**$905.0**

Table 1-64. Sheldon NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$402.6	$886.9	$1,289.5
Jobs	3	6	10
Job Income	$128.7	$266.8	$395.5
Total Tax Revenue	$55.7	$111.3	$167.0

Table 1-65 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 1-65. Sheldon NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Sheldon NWR	NA	$905.0	$726.6	$1,631.6

Steigerwald Lake National Wildlife Refuge

Description

Located on the Columbia River, 10 miles east of Vancouver, Washington, the 1,049-acre Steigerwald Lake National Wildlife Refuge consists of historic riverine flood plain habitat, semi-permanent wetlands, cottonwood-dominated riparian corridors, pastures, and remnant stands of Oregon white oak.

The refuge lies partly within the Columbia River Gorge National Scenic Area, and has been designated as the location for a "Gateway to the Gorge" visitor center. This facility has not secured funding and is not on a U.S. Fish and Wildlife Service construction priority list.

Area Economy

Steigerwald Lake NWR is located in southwest Washington. Table 1-66 shows the area economy. The area population increased by 15 percent from 2001 to 2011, compared with a 12 and 14 percent increase for Oregon and Washington, and a 9 percent increase for the U.S. as a whole. Area employment increased by 8 percent from 2001 to 2011, with Oregon and Washington showing a 6 and 9 percent increase respectively, and the U.S. a 6 percent increase. Area per capita income decreased by 2 percent over the 2001-2011 period, while Oregon and Washington, and the U.S. increased by 1, 5 and 5 percent respectively.

Table 1-66. Steigerwald Lake NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Clackamas OR	380.2	11%	218.1	11%	$45,915	-1%
Multnomah OR	748.0	12%	577.2	5%	$41,658	-4%
Washington OR	540.4	17%	296.9	10%	$42,639	1%
Clark WA	433.4	21%	183.7	15%	$37,695	-3%
Area Total	**2,102.1**	**15%**	**1,275.9**	**8%**	**$41,863**	**-2%**
Oregon	3,871.9	12%	2,221.8	6%	$37,527	1%
Washington	6,830.0	14%	3,828.6	9%	$43,878	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 1-67 shows the recreation visits for Steigerwald Lake NWR**.** The Refuge had 44,531 visits in 2011. All visits were for non-consumptive activities. Visitors enjoy hiking, programs on bats and birds, and night hikes.

Table 1-67. Steigerwald Lake NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	31,520	7,880	39,400
Auto Tour	0	0	0
Boat Trail/Launch	0	0	0
Bicycle	665	35	700
Interpretation	913	228	1,141
Photography	1,312	328	1,640
Other Recreation	1,320	330	1,650
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	**35,730**	**8,801**	**44,531**

Regional Economic Analysis

The economic area for the Refuge is the Portland Metropolitan Area including Clark County, Washington and Multnomah, Washington, and Clackamas Counties in Oregon. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 1-68. Total expenditures were $721,900 with non-residents accounting for $434,200 or 60 percent of total expenditures.

Table 1-69 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.4 million with associated employment of 10 jobs, $406,700 in employment income and $183,200 in total tax revenue.

Table 1-68. Steigerwald Lake NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$287.7	$434.2	$721.9
Hunting	$0.0	$0.0	$0.0
Fishing	$0.0	$0.0	$0.0
Total Expenditures	**$287.7**	**$434.2**	**$721.9**

Table 1-69. Steigerwald Lake NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$540.4	$820.2	$1,360.5
Jobs	4	6	10
Job Income	$163.0	$243.8	$406.7
Total Tax Revenue	$74.6	$108.6	$183.2

Table 1-70 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 1-70. Steigerwald Lake NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Steigerwald Lake NWR	NA	$721.9	$702.4	$1,424.3

Tualatin River National Wildlife Refuge

Description

Just a few short miles from the center of Oregon's largest city, the honking of geese replaces the honking of cars. This special place is a refuge, a haven for wildlife and people. Born of a community's dream, and made possible by their support, a wildlife refuge now thrives in the backyard of a growing metropolis.

Located on the outskirts of Portland, Tualatin River National Wildlife Refuge is one of only a handful of urban national wildlife refuges in the country. Situated within the floodplain of the Tualatin River, the Refuge comprises less than 1 percent of the 712 square mile watershed. Yet, due to its richness and diversity of habitats, the Refuge supports some of the most abundant and varied wildlife in the watershed.

The Refuge is now home to nearly 200 species of birds, over 50 species of mammals, 25 species of reptiles and amphibians, and a wide variety of insects, fish and plants. The Refuge has also become a place where people can experience and learn about wildlife and the places they call home.

Area Economy

Tualatin River NWR is located in northwestern Oregon. Table 1-71 shows the area economy. The area population increased by 13 percent from 2001 to 2011, compared with a 12 percent increase for Oregon, and a 9 percent increase for the U.S. as a whole. Area employment increased by 8 percent from 2001 to 2011, with Oregon showing a 6 percent increase respectively, and the U.S. a 6 percent increase. Area per capita income decreased by 1 percent over the 2001-2011 period, while Oregon and the U.S. increased by 1 and 5 percent respectively.

Table 1-71. Tualatin River NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Clackamas, OR	380.2	11%	218.1	11%	$45,915	-1%
Marion, OR	318.9	11%	169.2	7%	$33,841	5%
Multnomah, OR	748.0	12%	577.2	5%	$41,658	-4%
Washington, OR	540.4	17%	296.9	10%	$42,639	1%
Yamhill, OR	100.0	16%	44.9	15%	$33,980	5%
Area Total	**2,087.5**	**13%**	**1,306.4**	**8%**	**$41,125**	**-1%**
Oregon	3,871.9	12%	2,221.8	6%	$37,527	1%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 1-72 shows the recreation visits for Tualatin River NWR**.** The Refuge had 103,780 visits in 2011. All visits were for non-consumptive activities. Residents comprised 84 percent of all Refuge visits.

Table 1-72. Tualatin River NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	59,040	14,760	73,800
Auto Tour	0	0	0
Boat Trail/Launch	0	0	0
Bicycle	0	0	0
Interpretation	26,666	1,403	28,069
Photography	1,815	96	1,911
Other Recreation	0	0	0
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	**87,521**	**16,259**	**103,780**

Regional Economic Analysis

The economic area for the Refuge is the Portland Metropolitan Area including Clackamas, Marion, Multnomah, Washington, and Yamhill Counties in Oregon. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown inTable 1-73. Total expenditures were $1.2 million with non-residents accounting for $632,300 or 53 percent of total expenditures.

Table 1-74 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.6 million with associated employment of 17 jobs, $703,300 in employment income and $314,600 in total tax revenue.

Table 1-73. Tualatin River NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$564.8	$632.3	$1,197.1
Hunting	$0.0	$0.0	$0.0
Fishing	$0.0	$0.0	$0.0
Total Expenditures	**$564.8**	**$632.3**	**$1,197.1**

Table 1-74. Tualatin River NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$738.8	$888.3	$1,627.1
Jobs	8	9	17
Job Income	$332.8	$370.5	$703.3
Total Tax Revenue	$150.8	$163.8	$314.6

Table 1-75 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $3.87 means that for every $1 of budget expenditures, $3.87 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 1-75. Tualatin River NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Tualatin River NWR	$651.4	$1,197.1	$1,325.1	$3.87

Turnbull National Wildlife Refuge

Description

Turnbull National Wildlife Refuge is located in an area of northeastern Washington on the eastern edge of the Columbia River Basin, known as the Channeled Scablands. This rugged terrain supports a unique pattern of wetlands, rock, ponderosa pine and aspen forests, grassland, and shrub-steppe habitat. Located within the Pacific Flyway, the 18,685 acre refuge includes deep permanent sloughs, semi-permanent potholes, and seasonal wetlands. This mosaic provides important habitat for migrating and breeding waterfowl and other water birds.

The upland habitat, primarily ponderosa pine/grassland mixed with exposed basalt cliffs and areas of meadow and shrub-steppe, supports a large variety of wildlife. More than 200 different kinds of birds and 45 mammal species occur in this area.

Mammals include moose, elk, mule and white-tailed deer, coyote, badger, porcupine, muskrat, river otter, beaver, and 11 species of bats. The refuge provides habitat for two federally listed plants -water howellia and Spalding's catchfly. Each year the refuge receives more than 50,000 visitors and over 8,000 children participate in refuge environmental education programs. Volunteers work more than 18,000 hours annually to support various refuge programs.

Area Economy

Turnbull NWR is located in Spokane County in eastern Washington. Table 1-76 shows the area economy. The county population increased by 12 percent from 2001 to 2011, compared with a 14 percent increase for Washington and a 9 percent increase for the U.S. as a whole. County employment increased by 7 percent from 2001 to 2011, with Washington showing a 9 percent increase and the U.S. a 6 percent increase. Per capita income in Spokane County increased by 5 percent over the 2001-2011 period, while Washington and the U.S. both increased by 5 percent.

Table 1-76. Turnbull NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Spokane WA	473.8	12%	264.7	7%	$35,940	5%
Washington	6,830.0	14%	3,828.6	9%	$43,878	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 1-77 shows the recreation visits for Turnbull NWR. The Refuge had 54,196 visits in 2011. Non-consumptive recreation accounted for 53,747 visits and hunting accounted for 449 visits. Residents comprised 79 percent of all Refuge visits. "Other Recreation" includes cross country skiing, snowshoeing, and jogging.

Table 1-77. Turnbull NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	6,863	2,288	9,150
Auto Tour	28,159	7,040	35,199
Boat Trail/Launch	0	0	0
Bicycle	1,045	55	1,100
Interpretation	3,470	868	4,338
Photography	2,885	721	3,606
Other Recreation	350	4	354
Hunting:			
Big Game	235	156	391
Small Game	0	0	0
Migratory Birds	57	1	58
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	**43,064**	**11,132**	**54,196**

Regional Economic Analysis

The economic area for the Refuge is Spokane County in Washington. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 1-78. Total expenditures were $624,200 with non-residents accounting for $391,800 or 63 percent of total expenditures. Expenditures on non-consumptive activities accounted for 93 percent of Refuge visitation expenditures.

Table 1-79 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.0 million with associated employment of 12 jobs, $321,500 in employment income and $127,700 in total tax revenue.

Table 1-78. Turnbull NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$220.3	$360.3	$580.6
Hunting	$12.1	$31.5	$43.6
Fishing	$0.0	$0.0	$0.0
Total Expenditures	**$232.4**	**$391.8**	**$624.2**

Table 1-79. Turnbull NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$403.9	$671.2	$1,075.1
Jobs	4	8	12
Job Income	$122.5	$199.0	$321.5
Total Tax Revenue	$49.6	$78.2	$127.7

Table 1-80 shows total economic effects (total recreation expenditures plus net economic value) budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 1-80. Turnbull NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Turnbull NWR	NA	$624.2	$571.6	$1,195.8

Willapa National Wildlife Refuge

Description

Willapa National Wildlife Refuge is located on Willapa Bay, one of the most pristine estuaries in the United States. Willapa Bay is the second largest estuary on the Pacific coast and includes over 260 square miles of water surface. Many salmon species are found in the waters of Willapa Bay, including chum, chinook, and coho.

The refuge preserves several unique ecosystems, including diverse salt marshes, muddy tideflats, rain-drenched old growth forests, and dynamic coastal dunes and beaches. Freshwater marshes and grasslands are found along the southern shore of the bay.

The bay's shallow water and mud flats support vast beds of eelgrass and shellfish, providing spawning habitat for fish. During spring migration, more than 100,000 shorebirds are present. Isolated sandbars provide pupping grounds for harbor seals and rest sites for migratory birds.

Seabirds, such as brown pelicans, stream into the bay from the ocean in summer and fall. Other coastal habitats include sand dunes, sand beaches, and mud flats to grasslands, saltwater and freshwater marshes, and coniferous forest, including an old-growth stand of western red cedar-western hemlock forest. Important species include the threatened marbled murrelet, bald eagles, great blue herons, and Brant. Grasslands and neighboring forests are home to bear, elk, bobcat, woodpeckers, flying squirrels, spotted owls, silver-haired bats, and Pacific tree frogs.

Area Economy

Willapa NWR is located in southwest Washington. Table 1-81 shows the area economy. The area population increased by 3 percent from 2001 to 2011, compared with 12 and 14 percent increases for Oregon and Washington respectively and a 9 percent increase for the U.S. as a whole. Area employment increased by 7 percent from 2001 to 2011, with Oregon and Washington showing 6 and 9 percent increases respectively and the U.S. a 6 percent increase. Per capita income in the area increased by 9 percent over the 2001-2011 period, while Oregon and Washington showed increases of 1 and 5 percent respectively and the U.S. increasing by 5 percent.

Table 1-81. Willapa NWR:
Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Clatsop, OR	37.2	5%	23.6	9%	$35,021	7%
Pacific, WA	20.9	1%	9.3	1%	$32,648	13%
Area Total	**58.1**	**3%**	**32.9**	**7%**	**$34,166**	**9%**
Oregon	3,871.9	12%	2,221.8	6%	$37,527	1%
Washington	6,830.0	14%	3,828.6	9%	$43,878	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 1-82 shows the recreation visits for Willapa NWR. The Refuge had 114,680 visits in 2011. Non-consumptive recreation accounted for 113,850 visits, and hunting accounted for 680 visits. Residents comprised 37 percent of all Refuge visits.

Table 1-82. Willapa NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	36,974	68,666	105,640
Auto Tour	0	0	0
Boat Trail/Launch	303	248	550
Bicycle	48	3	50
Interpretation	180	120	300
Photography	3,366	2,244	5,610
Other Recreation	510	1,190	1,700
Hunting:			
Big Game	144	176	320
Small Game	6	5	10
Migratory Birds	263	88	350
Fishing:			
Freshwater	0	0	0
Saltwater	128	23	150
Total Visitation	**41,920**	**72,761**	**114,680**

Regional Economic Analysis

The economic area for the Refuge is Pacific County, Washington and Clatsop County, Oregon. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 1-83. Total expenditures were $1.8 million with non-residents accounting for $1.7 million or 91 percent of total expenditures. Expenditures on non-consumptive activities accounted for 97 percent of Refuge visitation expenditures.

Table 1-84 summarizes the local economic effects associated with recreation visits. Final demand totaled $2.6 million with associated employment of 21 jobs, $719,800 in employment income and $311,300 in total tax revenue.

Table 1-83. Willapa NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$154.9	$1,612.4	$1,767.3
Hunting	$12.2	$40.4	$52.5
Fishing	$4.2	$1.7	$5.9
Total Expenditures	**$171.2**	**$1,654.5**	**$1,825.7**

Table 1-84. Willapa NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$241.1	$2,322.1	$2,563.3
Jobs	2	18	21
Job Income	$68.4	$651.3	$719.8
Total Tax Revenue	$31.3	$279.7	$311.3

Table 1-85 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $1.40 means that for every $1 of budget expenditures, $1.40 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 1-85. Willapa NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Willapa NWR	$1,928.10	$1,825.7	$865.1	$1.40

Region 2

Region 2 for the U.S. Fish & Wildlife Service includes Arizona, New Mexico, Oklahoma, and Texas. Sample refuges selected within this region include:

Anahuac NWR (Texas)
Buenos Aires NWR (Arizona)
Deep Fork NWR (Oklahoma)
Hagerman NWR (Texas)
Laguna Atascosa NWR (Texas)
Las Vegas NWR (New Mexico)
Little River NWR (Oklahoma)
McFaddin NWR (Texas)
Muleshoe NWR (Texas)
Salt Plains NWR (Oklahoma)
Trinity River NWR (Texas)
Wichita Mountains NWR (Oklahoma)

Anahuac National Wildlife Refuge

Description

Located along the Upper Texas Coast, Anahuac National Wildlife Refuge is a 34,000 acre haven for a diversity of wildlife. Anahuac Refuge is located along East Galveston Bay and supports a diversity of wildlife and a variety of habitats including freshwater, brackish, and saltwater wetlands, coastal prairies and woodlots.

Anahuac Refuge is famous for the more than 300 migratory bird species that use the refuge for migration, wintering, or breeding. Anahuac Refuge is one of the only places on Earth to see all six species of North American rail, as well as a place that provides grounds for thousands of wintering waterfowl. Huge flocks of snow geese, sometimes in excess of 80,000, feed in rice fields and moist soil units within the Refuge.

Multiple management tools are used at Anahuac Refuge. They include grazing, farming, prescribed burning, exotic plant control, shoreline stabilization, and water level manipulation.

Situated between Houston and Beaumont, Texas and within 50 miles of more than 2 million people, Anahuac Refuge is visited each year by more than 90,000 people who come to enjoy and learn about these sensitive natural resources. The refuge provides environmental education programs for almost 2,000 school children every year, and educational events for the public to enjoy.

Area Economy

Anahuac NWR is located in eastern Texas on the Gulf of Mexico. Table 2-1 shows the area economy. The area population increased by 19 percent from 2001 to 2011, compared with a 20 percent increase for Texas and a 9 percent increase for the U.S. as a whole. Area employment increased by 18 percent from 2001 to 2011, with Texas showing a 20 percent increase and the U.S. a 6 percent increase. Area per capita income increased by 6 percent over the 2001-2011 period, while Texas and the U.S. increased by 8 and 5 percent respectively.

Table 2-1. Anahuac NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Chambers TX	35.6	33%	13.5	41%	$48,969	37%
Harris TX	4,180.9	20%	2,725.9	18%	$48,935	5%
Jefferson TX	252.8	1%	155.9	9%	$38,712	19%
Area Total	**4,469.2**	**19%**	**2,895.3**	**18%**	**$48,357**	**6%**
Texas	25,674.7	20%	14,611.5	20%	$40,147	8%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 2-2 shows the recreation visits for Anahuac NWR. The Refuge had 91,593 visits in 2011. Non-consumptive recreation accounted for 40,140 visits, hunting 4,499 visits, and fishing 46,954 visits. Residents comprised 87 percent of all Refuge visits.

Table 2-2. Anahuac NWR: 2011 Recreation Visits

Activity		Residents	Non-Residents	Total
Non-Consumptive:				
	Pedestrian	18,966	8,128	27,094
	Auto Tour	5,419	2,322	7,741
	Boat Trail/Launch	2,709	1,161	3,870
	Bicycle	0	0	0
	Interpretation	140	60	200
	Photography	515	221	735
	Other Recreation	350	150	500
Hunting:				
	Big Game	0	0	0
	Small Game	0	0	0
	Migratory Birds	4,499	0	4,499
Fishing:				
	Freshwater	0	0	0
	Saltwater	46,954	0	46,954
Total Visitation		**79,551**	**12,042**	**91,593**

Regional Economic Analysis

The economic area for the Refuge is Chambers, Harris, and Jefferson Counties in Texas. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 2-3. Total expenditures were $1.8 million with residents accounting for $1.5 million or 87 percent of total expenditures. Expenditures on fishing activities accounted for 68 percent of all expenditures, followed by non-consumptive and hunting at 24 and 8 percent respectively.

Table 2-4 summarizes the local economic effects associated with recreation visits. Final demand totaled $3.1 million with associated employment of 23 jobs, $965,700 in employment income and $404,900 in total tax revenue.

Table 2-3. Anahuac NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$185.9	$231.6	$417.5
Hunting	$145.2	$0.0	$145.2
Fishing	$1,200.0	$0.0	$1,200.0
Total Expenditures	**$1,531.1**	**$231.6**	**$1,762.7**

Table 2-4. Anahuac NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$2,746.5	$417.9	$3,164.3
Jobs	20	2	23
Job Income	$839.2	$126.5	$965.7
Total Tax Revenue	$354.5	$50.4	$404.9

Table 2-5 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $4.50 means that for every $1 of budget expenditures, $4.50 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 2-5. Anahuac NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Anahuac NWR	$783.8	$1,762.7	$1,764.6	$4.50

Buenos Aires National Wildlife Refuge

Description

Located on the U.S./Mexico border in southern Arizona, Buenos Aires National Wildlife Refuge contains 118,000 acres in a mix of habitat types, featuring a diverse array of wildlife. Elevations range from 3200 feet in the grasslands to 4,800 feet in Brown Canyon in the Baboquivari Mountains. Most of the refuge is semidesert grassland, which supports reintroduction of pronghorns and the endangered masked bobwhite quail. The masked bobwhite was driven to extinction in the U. S., but their rediscovery in Mexico led to captive breeding and release at Buenos Aires NWR. Through prescribed fire and other techniques, habitat restoration efforts focus on controlling mesquite invasion and promoting growth of native grasses and forbs.

The mix of grassland, riparian, and mountain stream habitats attracts many subtropical bird species. Nearly 340 species of birds have been recorded, drawing birders from all over the United States. Riparian areas on the east flank of the refuge attract subtropical specialties such as gray hawks and black-bellied whistling ducks. Grassland birds include red-tailed hawks, harriers, several kinds of flycatchers, loggerhead shrikes and many grassland sparrows.

Grassland mammals include mule deer, pronghorns, javelina, coyotes, and jackrabbits. Two kinds of nectar-feeding bats find their northernmost range extension here. The grasslands and the rugged mountains nearby have yielded reports and photographs of the occasional jaguar wandering north from Mexico. The variety of wildlife and rarities such as the jaguar attest to the importance of protecting this area for natural values.

The refuge attracts about 32,000 visitors (visitor use-days) per year. The visitor center offers literature, exhibits, and a video about the refuge. From this spot visitors can take the Pronghorn Drive auto tour loop, which meanders 10 miles through rolling grassland. More than 250 miles of dirt roads beckon the visitor to walk, drive, hunt, bicycle, or horseback ride.

Area Economy

Table 2-6 shows the area economy for Buenos Aires NWR. The area population increased by 15 percent from 2001 to 2011, compared with a 23 percent increase for Arizona and a 9 percent increase for the U.S. as a whole. Area employment increased by 9 percent from 2001 to 2011, with Arizona showing a 14 percent increase and the U.S. a 6 percent increase. Area per capita income increased by 8 percent over the 2001-2011 period, while Arizona and the U.S. increased by 2 and 5 percent respectively.

Table 2-6. Buenos Aires NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Prima AZ	989.6	15%	479.3	9%	$34,961	8%
Santa Cruz AZ	47.7	21%	18.3	16%	$25,037	8%
Area Total	**1,037.2**	**15%**	**497.6**	**9%**	**$34,505**	**8%**
Arizona	6,482.5	23%	3,227.5	14%	$35,062	2%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 2-7 shows the recreation visits for Buenos Aires NWR. The Refuge had 21,908 visits in 2011. Non-consumptive recreation accounted for 18,808 visits, and hunting accounted for 3,100 visits. Non-residents comprised 76 percent of all Refuge visits.

Table 2-7. Buenos Aires NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	4,500	4,500	9,000
Auto Tour	123	2,328	2,450
Boat Trail/Launch	0	0	0
Bicycle	5	86	90
Interpretation	83	1,585	1,668
Photography	20	180	200
Other Recreation	270	5,130	5,400
Hunting:			
Big Game	270	2,430	2,700
Small Game	5	41	45
Migratory Birds	18	338	355
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	**5,292**	**16,616**	**21,908**

Regional Economic Analysis

The economic area for the Refuge is Pima and Santa Cruz Counties in Arizona. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 2-8. Total expenditures were $1.0 million with non-residents accounting for $966,300 or 93 percent of total expenditures. Expenditures on non-consumptive activities accounted for 56 percent of all expenditures, followed by hunting at 44 percent.

Table 2-9 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.5 million with associated employment of 11 jobs, $424,600 in employment income and $185,100 in total tax revenue.

Table 2-8. Buenos Aires NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$62.2	$523.7	$585.9
Hunting	$11.3	$442.6	$454.0
Fishing	$0.0	$0.0	$0.0
Total Expenditures	**$73.5**	**$966.3**	**$1,039.8**

Table 2-9. Buenos Aires NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$105.1	$1,382.7	$1,487.8
Jobs	1	10	11
Job Income	$30.1	$394.5	$424.6
Total Tax Revenue	$13.8	$171.3	$185.1

Table 2-10 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $0.62 means that for every $1 of budget expenditures, $0.62 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 2-10. Buenos Aires NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Buenos Aires NWR	$2,725.7	$1,039.8	$657.9	$0.62

Deep Fork National Wildlife Refuge

Description

The east-central Oklahoma landscape provides the backdrop of a diminishing ecosystem. Lush hardwood forests surrounding oxbow lakes while a meandering river winds through bottomland forests and upland prairies and cast iron forests stand sentinel to the times. Deep Fork National Wildlife Refuge was established in 1993 to protect these important wetlands and bottomland hardwood forests along the Deep Fork River. With its proximity to the Deep Fork River, the Refuge is subject to flooding at least once a year. This flooding results in excellent conditions for waterfowl, including mallard, blue-winged teal, shoveler, pintail and wood ducks. Each time the Deep Fork river swells over its banks, the waters deposit rich alluvial soils through the adjacent hardwood forests. The 9,600-acre refuge is one of more than 550 refuges throughout the United States managed by the U.S. Fish and Wildlife Service.

Wildlife abounds at Deep Fork National Wildlife Refuge. No known Federally listed species reside on the Refuge at this time. Species of State Concern whose ranges include or approach Okmulgee County and which could occur on the Refuge include the prairie mole cricket, goldeye (fish), northern scarlet snake, Louisiana milk snake, Swainson's hawk, prairie falcon, barn owl, loggerhead shrike, Bell's vireo, Bachman's sparrow, mountain lion, river otter, long-tailed weasel, woodchuck, rice rat, meadow jumping mouse, and eastern harvest mouse.

A total of 149 species of birds are known or thought to use the bottomland forests and associated habitats. The numerous sloughs and steams support large numbers of great blue heron, little blue herons, and great and snowy egrets. The Refuge is a very important migration stop for many species of neo-tropical birds and provides suitable nesting habitat for many others. Migratory eagles arriver in Oklahoma in November and depart by the end of February. The wetlands nourished by the Deep Fork River provide important wintering habitat for numerous waterfowl species. Fifty-one species of mammals have been recorded in the Deep Fork River basin. The Deep Fork River provides feeding and spawning habitat for many sport fish native to east central Oklahoma. Fifty-nine fish species have been identified from the river, streams, and reservoirs of the Deep Fork River basin and many are likely to be found in Refuge waters. Approximately 54 species of reptiles and 22 species of amphibians have been reported from Okmulgee County.

Situated 35 miles south of Tulsa, on a major north south route between Kansas and Texas, Deep Fork NWR receives approximately 32,000 visitors annually. The refuge provides environmental education programs for 2500 students annually.

Area Economy

Deep Fork NWR is located in eastern Oklahoma. Table 2-11 shows the area economy. The area population increased by 9 percent from 2001 to 2011, compared with a 9 percent increase for Oklahoma and a 9 percent increase for the U.S. as a whole. Area employment increased by 5 percent from 2001 to 2011, with Oklahoma showing an 8 percent increase and the U.S. a 6 percent increase. Area per capita income increased by 8 percent over the 2001-2011 period, while Oklahoma and the U.S. increased by 8 and 5 percent respectively.

Table 2-11. Deep Fork NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Oklahoma OK	732.4	10%	548.9	7%	$42,480	10%
Okmulgee OK	39.9	1%	15.3	4%	$29,574	21%
Tulsa OK	610.6	8%	433.9	2%	$46,804	6%
Area Total	**1,382.9**	**9%**	**998.1**	**5%**	**$44,016**	**8%**
Oklahoma	3,791.5	9%	2,167.8	8%	$37,679	8%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 2-12 shows the recreation visits for Deep Fork NWR. The Refuge had 45,645 visits in 2011. Non-consumptive recreation accounted for 28,927 visits. Residents accounted for 37 percent of all Refuge visits.

Table 2-12. Deep Fork NWR: 2011 Recreation Visits

Activity		Residents	Non-Residents	Total
Non-Consumptive:				
	Pedestrian	3,000	1,000	4,000
	Auto Tour	0	0	0
	Boat Trail/Launch	99	31	130
	Bicycle	0	0	0
	Interpretation	9,079	27,236	36,315
	Photography	260	140	400
	Other Recreation	225	75	300
Hunting:				
	Big Game	750	250	1,000
	Small Game	2,000	0	2,000
	Migratory Birds	285	15	300
Fishing:				
	Freshwater	1,020	180	1,200
	Saltwater	0	0	0
Total Visitation		**16,718**	**28,927**	**45,645**

Regional Economic Analysis

The economic area for the Refuge is Oklahoma, Okmulgee, and Tulsa Counties in Oklahoma. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 2-13. Total expenditures were $751,800 with non-residents accounting for $580,200 or 77 percent of total expenditures. Expenditures on non-consumptive activities accounted for 82 percent of all expenditures, hunting and fishing followed at 14 percent and 4 percent, respectively.

Table 2-14 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.3 million with associated employment of 9 jobs, $402,600 in employment income and $159,200 in total tax revenue.

Table 2-13. Deep Fork NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$91.6	$524.5	$616.1
Hunting	$59.2	$43.5	$102.7
Fishing	$20.9	$12.1	$33.0
Total Expenditures	**$171.6**	**$580.2**	**$751.8**

Table 2-14. Deep Fork NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$296.9	$1,013.3	$1,310.2
Jobs	2	7	9
Job Income	$92.2	$310.4	$402.6
Total Tax Revenue	$38.5	$120.7	$159.2

Table 2-15 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $2.56 means that for every $1 of budget expenditures, $2.56 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 2-15. Deep Fork NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Deep Fork NWR	$577.6	$751.8	$724.2	$2.56

Hagerman National Wildlife Refuge

Description

Hagerman National Wildlife Refuge is located on the Big Mineral Arm of Lake Texoma near Sherman, Texas. The Refuge provides excellent habitat for many species of native wildlife including 338 species of birds, 36 species of mammals, 60 species of reptiles and amphibians, and 61 species of fish. Both upland and wetland habitats at the Refuge are actively managed for wildlife. Farming provides 400 acres of wheat for wintering geese. Earthen dikes create shallow marshes for waterfowl, wading birds, and shorebirds. Native prairies are being restored to help protect the soil and provide food and cover for grassland birds and insects. Refuge hardwood forests are very important to songbirds for summer breeding grounds and resting during migration.

Situated about one hour north of the Dallas-Ft.Worth Metroplex, Hagerman Refuge is within 100 miles of more than 6 million people. Each year, more than 135,000 people come to enjoy wildlife observation and photography, fishing, hiking, hunting, and nature exploration. Five hiking trails and a wildlife drive are offered to facilitate these activities. Three Day Use Areas provide picnic tables, restroom facilities, and bank fishing. A new Visitor Center completed in September 2011 provides refuge information and exhibits that highlight area wildlife and habitats, migratory birds, and the former town of Hagerman. A multi-purpose room in the new facility will host environmental education and interpretive nature programs for more than 5,000 people annually.

Area Economy

Hagerman NWR is located in northeastern Texas. Table 2-16 shows the area economy. The area population increased by 41 percent from 2001 to 2011, compared with 9 and 20 percent increases respectively for Oklahoma and Texas, and a 9 percent increase for the U.S. as a whole. Area employment increased by 56 percent from 2001 to 2011, with Oklahoma and Texas showing 8 and 20 percent increase respectively, and the U.S. a 6 percent increase. Area per capita income increased by 1 percent over the 2001-2011 period, while Oklahoma, Texas and the U.S. increased by 13, 8 and 5 percent respectively.

Table 2-16. Hagerman NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Bryan OK	43.1	18%	21.3	11%	$28,891	8%
Collin TX	812.2	52%	463.3	73%	$52,419	-5%
Cooke TX	38.4	4%	28.4	27%	$45,765	38%
Grayson TX	121.4	8%	58.2	4%	$33,404	12%
Area Total	**1,015.1**	**41%**	**571.3**	**56%**	**$48,894**	**1%**
Oklahoma	3,791.5	9%	2,167.8	8%	$37,679	13%
Texas	25,674.7	20%	14,611.5	20%	$40,147	8%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 2-17 shows the recreation visits for Hagerman NWR. The Refuge had 152,550 visits in 2011. Non-consumptive recreation accounted for 132,100 visits. Residents accounted for 54 percent of all Refuge visits.

Table 2-17. Hagerman NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	2,050	2,050	4,100
Auto Tour	42,750	42,750	85,500
Boat Trail/Launch	263	88	350
Bicycle	325	325	650
Interpretation	1,200	800	2,000
Photography	19,250	19,250	38,500
Other Recreation	600	400	1,000
Hunting:			
Big Game	90	135	225
Small Game	85	15	100
Migratory Birds	106	19	125
Fishing:			
Freshwater	16,000	4,000	20,000
Saltwater	0	0	0
Total Visitation	**82,719**	**69,831**	**152,550**

Regional Economic Analysis

The economic area for the Refuge is Bryan County, Oklahoma and Collin, Cooke, and Grayson Counties in Texas. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 2-18. Total expenditures were $3.0 million with non-residents accounting for $2.1 million or 68 percent of total expenditures. Expenditures on non-consumptive activities accounted for 79 percent of all expenditures, hunting accounted for 20 percent, and fishing accounted for 1 percent.

Table 2-19 summarizes the local economic effects associated with recreation visits. Final demand totaled $4.0 million with associated employment of 34 jobs, $1.2 million in employment income and $475,900 in total tax revenue.

Table 2-18. Hagerman NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$616.8	$1,772.8	$2,389.6
Hunting	$7.6	$25.4	$33.0
Fishing	$328.1	$269.1	$597.2
Total Expenditures	**$952.5**	**$2,067.3**	**$3,019.8**

Table 2-19. Hagerman NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$1,253.2	$2,783.7	$4,036.9
Jobs	12	22	34
Job Income	$357.2	$795.7	$1,152.9
Total Tax Revenue	$159.4	$316.5	$475.9

Table 2-20 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $4.81 means that for every $1 of budget expenditures, $4.81 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 2-20. Hagerman NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Hagerman NWR	$1,322.3	$3,019.8	$3,338.1	$4.81

Laguna Atascosa National Wildlife Refuge

Description

Laguna Atascosa National Wildlife Refuge (NWR) is located deep within south Texas next to the Gulf of Mexico. Rare wildlife finds a haven within Laguna Atascosa NWR, the largest federally protected habitat remaining in the Lower Rio Grande Valley. A vibrant mix of habitats, from subtropical forests to deserts, prairies and coastline, support a mix of wildlife found nowhere else in the world.

Laguna Atascosa NWR is home to the majority of the remaining ocelots in the United States and serves as the national center for ocelot conservation and recovery. The ocelot is one of the nine federally listed endangered or threatened species on the refuge, along with another rare cat, the jaguarundi, and five species of sea turtles.

Laguna Atascosa NWR has an impressive 415 species of birds that inhabit the refuge for migration, wintering, or breeding, more bird species than any other National Wildlife Refuge. Several tropical species reach their northernmost range South Texas, and is where the Central and Mississippi Flyways converge. The American Bird Conservancy designates the refuge as a “globally important bird area” for its amazing variety of migratory, winter and resident birds and habitats. Millions of migratory shorebirds, raptors, songbirds and waterfowl touch down each year on their journeys between winter homes in Mexico, Central and South America and nesting habitats as far north as the tundra above the Arctic Circle.

Laguna Atascosa NWR is situated between Harlingen and South Padre Island, a highly visited vacation spot for Mexican Nationals, retirees, and college students. Laguna Atascosa is visited each year by more than 150,000 people that come to learn about and enjoy the variety of natural resources that South Texas has to offer. Laguna Atascosa provides environmental education programs for 1,600 school students, conducts numerous interpretation programs to approximately 9,000 participants, and attends various off-site, outreach events reaching close to 6,000 people each year. Laguna Atascosa and Friends of Laguna Atascosa host the Ocelot Conservation Festival every spring to educate local communities about the conservation of the ocelot and its habitat.

Area Economy

Laguna Atascosa NWR is located in on the southern tip of Texas. Table 2-21 shows the area economy. The area population increased by 30 percent from 2001 to 2011, compared with a 20 percent increase for Texas and a 9 percent increase for the U.S. as a whole. Area employment increased by 36 percent from 2001 to 2011, with Texas showing a 20 percent increase and the U.S. a 6 percent increase. Area per capita income increased by 15 percent over the 2001-2011 period, while Texas and the U.S. increased by 8 and 5 percent respectively.

Table 2-21. Laguna Atascosa NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Cameron TX	414.1	21%	174.2	22%	$23,236	15%
Hildalgo TX	797.8	35%	318.3	45%	$21,620	15%
Willacy TX	22.1	10%	6.6	29%	$26,462	37%
Area Total	**1,234.0**	**30%**	**499.1**	**36%**	**$22,249**	**15%**
Texas	25,674.7	20%	14,611.5	20%	$40,147	8%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 2-22 shows the recreation visits for Laguna Atascosa NWR. The Refuge had 440,042 visits in 2011. Non-consumptive recreation accounted for 273,707 visits. Residents accounted for 56 percent of all Refuge visits.

Table 2-22. Laguna Atascosa NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	37,784	25,189	62,973
Auto Tour	30,227	70,529	100,756
Boat Trail/Launch	28,834	3,204	32,038
Bicycle	11,021	4,723	15,744
Interpretation	2,741	10,964	13,705
Photography	14,169	33,062	47,231
Other Recreation	756	504	1,260
Hunting:			
Big Game	4,914	1,229	6,143
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	89,708	38,446	128,154
Saltwater	25,630	6,408	32,038
Total Visitation	**245,785**	**194,258**	**440,042**

Regional Economic Analysis

The economic area for the Refuge is Cameron, Hildalgo, and Willacy Counties in Texas. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 2-23. Total expenditures were $14.5 million with non-residents accounting for $8.7 million or 62 percent of total expenditures. Expenditures on fishing activities accounted for 56 percent of all expenditures, non-consumptive activities accounted for 42 percent.

Table 2-24 summarizes the local economic effects associated with recreation visits. Final demand totaled $23.4 million with associated employment of 205 jobs, $6.5 million in employment income and $2.6 million in total tax revenue.

Table 2-23. Laguna Atascosa NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$1,401.4	$4,623.8	$6,025.1
Hunting	$196.8	$207.8	$404.6
Fishing	$4,199.5	$3,864.8	$8,064.3
Total Expenditures	**$5,797.7**	**$8,696.4**	**$14,494.1**

Table 2-24. Laguna Atascosa NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$9,311.2	$14,101.3	$23,412.5
Jobs	89	116	205
Job Income	$2,599.4	$3,949.9	$6,549.3
Total Tax Revenue	$1,052.4	$1,511.8	$2,564.2

Table 2-25 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $37.17 means that for every $1 of budget expenditures, $37.17 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 2-25. Laguna Atascosa NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Laguna Atascosa NWR	$801.4	$14,494.1	$15,289.8	$37.17

Las Vegas National Wildlife Refuge

Description

Las Vegas National Wildlife Refuge was established in 1965 to provide wintering and migration habitat for ducks and geese of the Central flyway, as well as other migratory bird species. This 8,672 acre refuge is open seven days a week to the public for wildlife observation and photography. While driving the 8 mile auto tour you may see many types of wildlife depending on the season. In the fall and winter months when you look across the short grass prairie you may see Sandhill Cranes and thousands of geese and ducks and geese feeding in the fields or see the majestic Bald Eagle roosting on a cottonwood snag at the Crane Lake Observation Deck. In the spring and summer months you may see a variety of raptors, elk, or hear the howl of a coyote. The Crane Lake Observation Deck is a great place to view elk in the early morning or early evening hours. Whatever the season you can always enjoy the Gallinas Nature Trail which begins near a crumbling old rock homestead, drops down into a canyon and winds its way through Ponderosa pine and Juniper trees.

The refuge offers environmental education and interpretation programs to school groups and sponsors public events such as Fall Flight Festival Wildlife Drive, Concert for the Birds, and a variety of special presentations, in conjunction with the Friends of Las Vegas National Wildlife Refuge. Stop by the Refuge Headquarters for more information, Monday – Friday 8:00 am to 4:00 pm. The Melton Pond overlook, located at the headquarters, is open during daylight hours. Visit the Friends of Las Vegas National Wildlife Refuge website at http://flvnwr.org/ for an update of events or to become a member and invest time in a variety of projects designed to support and enhance your national treasure.

Area Economy

Las Vegas NWR is located in northeastern New Mexico. Table 2-26 shows the area economy. The area population increased by 9 percent from 2001 to 2011, compared with a 14 percent increase for New Mexico and a 9 percent increase for the U.S. as a whole. Area employment increased by 8 percent from 2001 to 2011, with New Mexico showing a 10 percent increase and the U.S. a 6 percent increase. Area per capita income increased by 8 percent over the 2001-2011 period, while New Mexico and the U.S. increased by 9 and 5 percent respectively.

Table 2-26. Las Vegas NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
San Miguel NM	29.3	-2%	12.4	0%	$31,366	28%
Sante Fe NM	145.6	11%	86.7	9%	$43,325	4%
Area Total	**174.9**	**9%**	**99.2**	**8%**	**$41,322**	**8%**
New Mexico	2,082.2	14%	1,065.9	10%	$34,133	9%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 2-27 shows the recreation visits for Las Vegas NWR. The Refuge had 16,837 visits in 2011. Non-consumptive recreation accounted for 16,761 visits. Residents accounted for 43 percent of all Refuge visits.

Table 2-27. Las Vegas NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	1,639	1,639	3,278
Auto Tour	4,034	7,491	11,525
Boat Trail/Launch	0	0	0
Bicycle	0	0	0
Interpretation	593	105	698
Photography	0	0	0
Other Recreation	756	504	1,260
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	57	19	76
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	**7,079**	**9,758**	**16,837**

Regional Economic Analysis

The economic area for the Refuge is San Miguel and Santa Fe Counties in New Mexico. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 2-28. Total expenditures were $111,900 with non-residents accounting for $88,900 or 79 percent of total expenditures. Expenditures on non-consumptive activities accounted for 97 percent of all expenditures, hunting accounted for 3 percent.

Table 2-29 summarizes the local economic effects associated with recreation visits. Final demand totaled $160,500 with associated employment of 1 job, $47,800 in employment income and $20,100 in total tax revenue.

Table 2-28. Las Vegas NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$21.7	$87.3	$108.9
Hunting	$1.4	$1.6	$2.9
Fishing	$0.0	$0.0	$0.0
Total Expenditures	**$23.0**	**$88.9**	**$111.9**

Table 2-29. Las Vegas NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$33.1	$127.4	$160.5
Jobs	0	1	1
Job Income	$9.7	$38.1	$47.8
Total Tax Revenue	$4.4	$15.8	$20.1

Table 2-30 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $0.28 means that for every $1 of budget expenditures, $0.28 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 2-30. Las Vegas NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Las Vegas NWR	$796.1	$111.9	$107.8	$0.28

Little River National Wildlife Refuge

Description

Little River National Wildlife Refuge was established on February 10, 1987 to preserve wetlands and the bottomland hardwood forest ecosystem for waterfowl and other migratory birds. The 15,000 acre refuge is located in the floodplain of the Little River, and serves to protect one of the last remaining remnants of the once extensive bottomland hardwood forest ecosystem of the Little River floodplain.

The refuge supports a diversity of wildlife including both migratory and resident species. Over 191 bird species spend all or part of the year on the refuge. Numerous waterfowl species utilize the wetland habitats during the fall, winter, and spring. Mallards and wood ducks are found in large numbers with many other species of ducks found in smaller numbers. Neotropical migrant songbirds are the most colorful and abundant species present on the refuge from spring to fall. Numerous species of warblers, tanagers, flycatchers, and vireos utilize the bottomland forest habitat as a place to nest and forage. In addition to birds, the refuge host 109 species of fish, 79 species of amphibians and reptiles, and 48 species of mammals.

The wetlands come alive in the spring and resonate with the calls of green tree frogs, spring peepers, upland chorus frogs, and bird-voiced tree frogs. Reptiles, such as the timber rattlesnake, cottonmouth, green anole, and snapping turtle are common on the refuge. The wetland swamps located throughout the refuge are also home to the American alligator.

The refuge protects the largest remaining tract of bottomland hardwood forest in the Little River floodplain, and significantly contributes to the diversity of plant and animal species in southeastern Oklahoma.

Area Economy

Little River NWR is located in southeastern Oklahoma. Table 2-31 shows the area economy. The area population decreased by 2 percent from 2001 to 2011, compared with a 9 percent increase for Oklahoma and a 9 percent increase for the U.S. as a whole. Area employment decreased by 8 percent from 2001 to 2011, with Oklahoma showing an 8 percent increase and the U.S. a 6 percent increase. Area per capita income increased by 7 percent over the 2001-2011 period, while Oklahoma and the U.S. increased by 13 and 5 percent respectively.

Table 2-31. Little River NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
McCurtain OK	33.2	-2%	16.3	-8%	$28,209	7%
Oklahoma	3,791.5	9%	2,167.8	8%	$37,679	13%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 2-32 shows the recreation visits for Little River NWR. The Refuge had 15,150 visits in 2011. Non-consumptive recreation accounted for 7,360 visits. Residents accounted for 71 percent of all Refuge visits.

Table 2-32. Little River NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	705	470	1,175
Auto Tour	100	100	200
Boat Trail/Launch	228	152	380
Bicycle	0	0	0
Interpretation	3,850	1,650	5,500
Photography	53	53	105
Other Recreation	0	0	0
Hunting:			
Big Game	510	340	850
Small Game	1,050	450	1,500
Migratory Birds	308	132	440
Fishing:			
Freshwater	4,000	1,000	5,000
Saltwater	0	0	0
Total Visitation	**10,804**	**4,347**	**15,150**

Regional Economic Analysis

The economic area for the Refuge is McCurtain County, Oklahoma. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2011 are shown in

Table 2-33. Total expenditures were $366,100 with non-residents accounting for $207,900 or 57 percent of total expenditures. Expenditures on fishing activities accounted for 40 percent of all expenditures, fishing accounted for 34 percent, and non-consumptive activities accounted for 26 percent.

Table 2-34 summarizes the local economic effects associated with recreation visits. Final demand totaled $430,800 with associated employment of 4 jobs, $134,600 in employment income and $57,100 in total tax revenue.

Table 2-33. Little River NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$37.2	$56.9	$94.1
Hunting	$39.0	$83.7	$122.7
Fishing	$82.0	$67.3	$149.3
Total Expenditures	**$158.3**	**$207.9**	**$366.1**

Table 2-34. Little River NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$188.7	$242.1	$430.8
Jobs	2	2	4
Job Income	$55.6	$79.0	$134.6
Total Tax Revenue	$24.4	$32.7	$57.1

Table 2-35 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $2.31 means that for every $1 of budget expenditures, $2.31 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 2-35. Little River NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Little River NWR	$347.1	$366.1	$436.2	$2.31

McFaddin National Wildlife Refuge

Description

McFaddin National Wildlife Refuge supplies important feeding and resting habitat for migrating and wintering populations of waterfowl. Established in 1980, the 58,000 acre McFaddin NWR consists of the largest remaining freshwater marsh on the Texas Coast and thousands of acres of intermediate to brackish marsh.

Bayous weave through a seemingly endless expanse of cordgrass, reptilian eyes at the water's surface witness the ever-changing variety of waterfowl, and the call of the clapper rail reverberates through the marsh. For hundreds of years, many of the sights and sounds within this dynamic eco-system have gone untouched.

Area Economy

McFaddin NWR is located in Texas in the gulf coast region near the Louisiana border. Table 2-36 shows the area economy. The area population increased by 10 percent from 2001 to 2011, compared with a 20 percent increase for Texas and a 9 percent increase for the U.S. as a whole. Area employment increased by 14 percent from 2001 to 2011, with Texas showing a 20 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 17 percent over the 2001-2011 period, while Texas,and the U.S. increased by 8 and 5 percent respectively.

Table 2-36. McFaddin NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Chambers TX	35.6	33%	13.5	41%	$48,969	37%
Galveston TX	295.7	16%	139.0	19%	$43,444	12%
Jefferson TX	252.8	1%	155.9	9%	$38,712	19%
Area Total	**584.1**	**10%**	**308.4**	**14%**	**$41,732**	**17%**
Texas	25,674.7	20%	14,611.5	20%	$40,147	8%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 2-37 shows the recreation visits for McFaddin NWR. The Refuge had 26,801 visits in 2011. The majority of visits were attributed to saltwater fishing activities. Residents accounted for 91 percent of all Refuge visits.

Table 2-37. McFaddin NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	0	0	0
Auto Tour	30	70	100
Boat Trail/Launch	0	0	0
Bicycle	0	0	0
Interpretation	0	0	0
Photography	1	5	5
Other Recreation	0	0	0
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	4,335	228	4,563
Fishing:			
Freshwater	0	0	0
Saltwater	19,920	2,213	22,133
Total Visitation	**24,285**	**2,516**	**26,801**

Regional Economic Analysis

The economic area for the Refuge is Chambers, Galveston, and Jefferson Counties in Texas. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 2-38. Total expenditures were $1.3 million with non-residents accounting for $130,200 or 10 percent of total expenditures. Expenditures on fishing activities accounted for 89 percent of all expenditures, and hunting activities accounted for 11 percent.

Table 2-39 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.7 million with associated employment of 16 jobs, $529,300 in employment income and $225,000 in total tax revenue.

Table 2-38. McFaddin NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$0.1	$0.7	$0.8
Hunting	$122.4	$21.8	$144.2
Fishing	$1,018.2	$107.7	$1,125.9
Total Expenditures	**$1,140.7**	**$130.2**	**$1,271.0**

Table 2-39. McFaddin NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$1,500.0	$242.1	$1,742.1
Jobs	14	2	16
Job Income	$450.4	$79.0	$529.3
Total Tax Revenue	$201.7	$23.3	$225.0

Table 2-40 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $4.54 means that for every $1 of budget expenditures, $4.54 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 2-40. McFaddin NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
McFaddin NWR	$535.2	$1,271.0	$1,159.8	$4.54

Muleshoe National Wildlife Refuge

Description

Muleshoe National Wildlife Refuge was the first National Wildlife Refuge established in Texas in 1935. The refuge is located on the southern high plains of West Texas which and is the only refuge within this area. The refuge consists on some of the only remaining native short grass prairie that has never been broken by the plow. The refuge also has three large saline lakes and three playa lakes. The refuge still resembles what the area would have looked like 200 years ago when Native American tribes and bison roamed the open prairie. Much of the surrounding landscape is now cultivated in cotton, wheat, or milo leaving the refuge an island of grass and water in sea of agriculture. This remote refuge is most famous for it high numbers of wintering waterfowl and sandhill cranes. The refuge hosts on average 80,000 to 100,000 sandhill cranes annually which attracts most of the visitors. Spring time visitors may also be treated with the sighting of the every increasingly rare lesser prairie chicken as well as a host of other spring migrants that use the refuge during migration. Summer visitors enjoy listening to native grassland birds such as the scaled quail, bobwhite quail, Cassin's sparrow, lark bunting, and Swainson's hawk to mention a few. Native wildlife such as large mule deer bucks, black-tailed prairie dogs towns, burrowing owls, bobcats, black-tailed jackrabbits, Texas horned lizards, and the occasional pronghorn antelope bring photographers, hikers, and visitors out during all months of the year. Many visitors also come to enjoy to the solitude of the prairie and imagine back to when the buffalo roamed area only 100 or so years ago with evidence of their past presence often found in the saline lakes when they are dry. Visitors can even see pre-historic fossil of the extinct North American horse which roamed the refuge 8000-10,000 years ago. Small interpretive displays are kept within the small office/visitors center depicting the times of the Buffalo Soldiers and more recent Worker Progress Administration (WPA) projects of the "Great Depression" when the refuge was established. This area also has native wildlife mounts for the public to view just in case they missed them on their.

The refuge also holds Environmental Education programs for local school districts. These programs focus on educating children and adults on the native wildlife and shortgrass prairie/playa lake ecosystem in which they live. The refuge also has a active prescribed grazing and fire program that are used to inform the public and local landowners on the benefit of these two tools in maintaining a healthy ecosystem. Currently, the refuge hosts approximately 18,000 to 25,000 visitors annually who come to see the last of the shortgrass prairie on the southern high plains of West Texas.

Area Economy

Muleshoe NWR is located in northwestern Texas. Table 2-41 shows the area economy. The area population increased by 14 percent from 2001 to 2011, compared with 14 and 20 percent increase for New Mexico and Texas respectively, and a 9 percent increase for the U.S. as a whole. Area employment increased by 12 percent from 2001 to 2011, with New Mexico and Texas showing 10 and 20 percent increase respectively, and the U.S. a 6 percent increase. Area per capita income increased by 15 percent over the 2001-2011 period, while New Mexico, Texas and the U.S. increased by 9, 8 and 5 percent respectively.

Table 2-41. Muleshoe NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Curry NM	49.6	10%	25.7	17%	$39,844	36%
Bailey TX	7.2	9%	4.0	8%	$35,115	7%
Lubbock TX	283.9	15%	168.9	12%	$34,644	12%
Area Total	**340.8**	**14%**	**198.6**	**12%**	**$35,412**	**15%**
New Mexico	2,082.2	14%	1,065.9	10%	$34,133	9%
Texas	25,674.7	20%	14,611.5	20%	$40,147	8%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 2-42 shows the recreation visits for Muleshoe NWR. The Refuge had 25,360 visits in 2011. All visits were for non-consumptive activities. Non-residents accounted for 85 percent of all Refuge visits.

Table 2-42. Muleshoe NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	864	4,896	5,760
Auto Tour	2,850	16,150	19,000
Boat Trail/Launch	0	0	0
Bicycle	6	24	30
Interpretation	4	7	10
Photography	6	54	60
Other Recreation	100	400	500
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	**3,830**	**21,531**	**25,360**

Regional Economic Analysis

The economic area for the Refuge is Curry County, New Mexico and Bailey and Lubbock Counties in Texas. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2011 are shown in Table 2-43. Total expenditures were $1.3 million with non-residents accounting for nearly $1.3 million or 94 percent of total expenditures.

Table 2-44 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.9 million with associated employment of 14 jobs, $543,700 in employment income and $219,600 in total tax revenue.

Table 2-43. Muleshoe NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$74.2	$1,210.4	$1,284.6
Hunting	$0.0	$0.0	$0.0
Fishing	$0.0	$0.0	$0.0
Total Expenditures	**$74.2**	**$1,210.4**	**$1,284.6**

Table 2-44. Muleshoe NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$109.0	$1,776.3	$1,885.4
Jobs	1	13	14
Job Income	$32.7	$511.0	$543.7
Total Tax Revenue	$14.4	$205.2	$219.6

Table 2-45 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $7.48 means that for every $1 of budget expenditures, $7.48 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 2-45. Muleshoe NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Muleshoe NWR	$304.7	$1,284.6	$993.4	$7.48

Salt Plains National Wildlife Refuge

Description

The refuge is located in Alfalfa County, Oklahoma, about 15 miles south of the Oklahoma/Kansas state line. The refuge headquarters is located 1.5 miles southwest of the junction of State Highways 11 & 38. The town of Cherokee is located 14 road miles to the west and the town of Jet is located 14 road miles south of the refuge headquarters. The refuge is approximately 50 miles northwest of Enid, Oklahoma.

Salt Plains NWR includes more than 32,000 acres, the majority comprising the Great Salt Plains Lake and the salt flats. The refuge consists of withheld lands; Corps overlay lands, and fee title lands. The Great Salt Plains Lake lies in the drainage of the Salt Fork of the Arkansas River and is a popular local and tourist recreational area.

The refuge is divided into almost equal parts of salt flats, open water, and vegetated land. More specifically, the refuge encompasses about 8,500 acres of the Great Salt Plains Lake; about 11,238 acres of level, salt-encrusted plains; 1,070 acres of manageable freshwater pools and moist soil units; 4,500 acres of grasslands; 3,700 acres of brushlands; 1,110 acres of woodlands, and 345 acres of riparian bottomlands. Additionally, there are 1,250 acres of cropland, and 315 acres of administrative lands including headquarters, roads, trails, etc.

The salt flats are located on the western side of the refuge, with the lake in the eastern portion. Ralstin Island is located in the northern portion of the lake and is used extensively for nesting by colonial water birds. The salt flats may not seem hospitable to wildlife, but are a major nesting site for the endangered least tern as well as the snowy plover, and American avocet. The flats are also a major migratory stopover for thousands of shorebirds during the spring and fall seasons. Shorebirds often feed on the swarms of salt brine flies that hatch when water is available.

Salt Plains NWR is the only known site where unique selenite crystals with hourglass inclusions are found. These crystals grow in a portion of the salt flats and are formed by the interaction of saline water and gypsum. Selenite crystals continue to grow in the salt flats as long as saline water conditions are maintained.

Area Economy

Salt Plains NWR is located in northern Oklahoma. Table 2-46 shows the area economy. The area population increased by 10 percent from 2001 to 2011, compared with a 9 percent increase for Oklahoma and a 9 percent increase for the U.S. as a whole. Area employment increased by 7 percent from 2001 to 2011, with Oklahoma showing an 8 percent increase and the U.S. a 6 percent increase. Area per capita income increased by 11 percent over the 2001-2011 period, while Oklahoma and the U.S. increased by 13 and 5 percent respectively.

Table 2-46. Salt Plains NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Alfalfa OK	5.7	-5%	3.1	1%	$31,281	12%
Garfield OK	60.7	6%	38.7	16%	$39,803	24%
Oklahoma OK	732.4	10%	548.9	7%	$42,480	10%
Woods OK	8.8	-1%	6.1	8%	$35,404	25%
Area Total	**807.5**	**10%**	**596.7**	**7%**	**$42,123**	**11%**
Oklahoma	3,791.5	9%	2,167.8	8%	$37,679	13%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 2-47 shows the recreation visits for Salt Plains NWR. The Refuge had 103,130 visits in 2011. Non-consumptive recreation accounted for 98,903 visits. Residents accounted for 44 percent of all Refuge visits.

Table 2-47. Salt Plains NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	2,248	3,372	5,620
Auto Tour	28,920	43,380	72,300
Boat Trail/Launch	1,350	150	1,500
Bicycle	41	0	41
Interpretation	480	0	480
Photography	120	80	200
Other Recreation	7,505	11,257	18,762
Hunting:			
Big Game	199	66	265
Small Game	7	2	9
Migratory Birds	362	91	453
Fishing:			
Freshwater	3,150	350	3,500
Saltwater	0	0	0
Total Visitation	**44,382**	**58,748**	**103,130**

Regional Economic Analysis

The economic area for the Refuge is Alfalfa, Garfield, Oklahoma, and Woods Counties in Oklahoma. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2011 are shown in Table 2-48. Total expenditures were $1.2 million with non-residents accounting for $911,200 or 74 percent of total expenditures. Expenditures on non-consumptive activities accounted for 88 percent of all expenditures.

Table 2-49 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.9 million with associated employment of 15 jobs, $610,000 in employment income and $241,500 in total tax revenue.

Table 2-48. Salt Plains NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$219.9	$861.1	$1,081.1
Hunting	$16.7	$18.6	$35.3
Fishing	$86.1	$31.4	$117.5
Total Expenditures	**$322.7**	**$911.2**	**$1,233.9**

Table 2-49. Salt Plains NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$499.0	$1,427.2	$1,926.1
Jobs	4	11	15
Job Income	$160.2	$449.8	$610.0
Total Tax Revenue	$67.6	$173.8	$241.5

Table 2-50 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $3.03 means that for every $1 of budget expenditures, $3.03 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 2-50. Salt Plains NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Salt Plains NWR	$826.9	$1,233.9	$1,272.9	$3.03

Trinity River National Wildlife Refuge

Description

Trinity River National Wildlife Refuge (NWR) was established January 4, 1994. The Refuge now totals nearly 25,000 acres. The Emergency Wetlands Resources Act of 1986 is the acquisition authority for the Refuge. The Refuge is about 45 miles east of Houston and, although located in a rural setting, it is within 65 miles of over 5.5 million people. Refuge visitation is generally over 22,000, but recent droughts and record heat has caused a reduction in visitors. A newly paved road in 2012 to our main public use area, along with a new headquarters facility constructed in 2012 will likely boost visits in the near future.

The primary purpose of establishing this Refuge is to protect a remnant of the bottomland hardwood forest ecosystem along the Trinity River. It is one of only 14 priority-one bottomland sites identified for protection in the Texas Bottomland Protection Plan. Additionally, this Refuge is located within the Gulf Coast Joint Venture Project Area of the North American Waterfowl Management Plan and, as such, is highly valuable for a diversity of waterfowl species. This type of habitat is used during migration or nesting by nearly 50 percent of the neotropical migratory bird species listed by the Service. Bottomland hardwood forests also support abundant populations of white-tailed deer, squirrels, numerous other furbearers, freshwater turtles, alligators, snakes, river otters, and bald eagles. Although not fully surveyed, it is known that the Refuge contains more than 635 plants, 75 butterflies, and another 350 vertebrate species including more than 213 birds, 49 fish, 44 mammals, and 52 reptiles and amphibians. The project site is the remnant of what was once a much larger natural area and still consists of a broad, flat flood plain, numerous sloughs, oxbows, artesian wells and tributaries, with few modifications. Timber harvest, gravel mining, and residential and commercial developments are imminent threats to the stability of this system.

Area Economy

Trinity River NWR is located east of Houston, Texas. Table 2-51 shows the area economy. The area population increased by 19 percent from 2001 to 2011, compared with a 20 percent increase for Texas and a 9 percent increase for the U.S. as a whole. Area employment increased by 18 percent from 2001 to 2011, with Texas showing a 20 percent increase and the U.S. a 6 percent increase. Area per capita income increased by 6 percent over the 2001-2011 period, while Texas and the U.S. increased by 8 and 5 percent respectively.

Table 2-51. Trinity River NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Harris TX	4,180.9	20%	2,725.9	18%	$48,935	5%
Jefferson TX	252.8	1%	155.9	9%	$38,712	19%
Liberty TX	76.2	6%	28.4	11%	$34,353	16%
Area Total	**4,509.9**	**19%**	**2,910.2**	**18%**	**$48,116**	**6%**
Texas	25,674.7	20%	14,611.5	20%	$40,147	8%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 2-52 shows the recreation visits for Trinity River NWR. The Refuge had 18,340 visits in 2011. Fishing activities accounted for the majority of recreation (82 percent). Residents accounted for 94 percent of all Refuge visits. Visitation numbers for 2011 were 30 percent lower than average due to drought. Waterfowl hunting was impacted the most because the season was closed due to low water conditions. The Refuge's fishing opportunities attract a number of fishers because it is the only public site in Liberty County.

Table 2-52. Trinity River NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	1,045	55	1,100
Auto Tour	0	0	0
Boat Trail/Launch	380	20	400
Bicycle	0	0	0
Interpretation	1,122	198	1,320
Photography	26	5	30
Other Recreation	0	0	0
Hunting:			
Big Game	371	41	412
Small Game	70	8	78
Migratory Birds	0	0	0
Fishing:			
Freshwater	14,250	750	15,000
Saltwater	0	0	0
Total Visitation	**17,264**	**1,077**	**18,340**

Regional Economic Analysis

The economic area for the Refuge is Harris, Jefferson, and Liberty Counties in Texas. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2011 are shown in
Table 2-53. Total expenditures were $266,200 with non-residents accounting for $43,200 or 16 percent of total expenditures. Expenditures on fishing activities accounted for 86 percent of all expenditures.

Table 2-54 summarizes the local economic effects associated with recreation visits. Final demand totaled $474,900 with associated employment of 4 jobs, $143,600 in employment income and $61,600 in total tax revenue.

Table 2-53. Trinity River NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$15.9	$3.7	$19.7
Hunting	$12.3	$5.8	$18.1
Fishing	$194.8	$33.6	$228.4
Total Expenditures	**$223.0**	**$43.2**	**$266.2**

Table 2-54. Trinity River NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$397.5	$77.5	$474.9
Jobs	3	1	4
Job Income	$120.4	$23.2	$143.6
Total Tax Revenue	$51.8	$9.7	$61.6

Table 2-55 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $1.53 means that for every $1 of budget expenditures, $1.53 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 2-55. Trinity River NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Trinity River NWR	$485.1	$266.2	$478.5	$1.53

Wichita Mountains National Wildlife Refuge

Description

The 59,020-acre Wichita Mountain Wildlife Refuge hosts a rare piece of the past - a remnant mixed grass prairie. This refuge is an island where the natural carpet of grass escaped destruction because the rocks underfoot defeated the plow.

The prairie community hums with life. The refuge provides habitat for large native grazing animals and Texas Longhorn cattle. Bison, elk, deer, coyotes, red-tailed hawks, prairie dogs, turkey, bunch grasses, post oak and blackjack oaks - these are just a few. More than 50 mammal species, 240 bird species, 64 reptile and amphibian species, 36 fish species, and 806 plant species thrive at this refuge.

Area Economy

Wichita Mountains NWR is located in Comanche County in the great plains country region of Oklahoma. Table 2-56 shows the area economy. The Comanche County population increased by 11 percent from 2001 to 2011, compared with a 9 percent increase for Oklahoma and a 9 percent increase for the U.S. as a whole. County employment increased by 9 percent from 2001 to 2011, with Oklahoma showing an 8 percent increase and the U.S. a 6 percent increase. Per capita income in the county increased by 25 percent over the 2001-2011 period, while Oklahoma, and the U.S. increased by 13 and 5 percent respectively.

Table 2-56. Wichita Mountains NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Comanche OK	125.8	11%	67.7	9%	$36,985	25%
Oklahoma	3,791.5	9%	2,167.8	8%	$37,679	13%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 2-57 shows the recreation visits for Wichita Mountains NWR. The Refuge had 3.2 million visits in 2011. The majority of visits were for non-consumptive activities. Non-residents accounted for 66 percent of all Refuge visits.

Table 2-57. Wichita Mountains NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	58,352	113,271	171,623
Auto Tour	576,980	1,120,020	1,697,000
Boat Trail/Launch	3,501	6,796	10,297
Bicycle	2,918	5,663	8,581
Interpretation	14,258	27,678	41,936
Photography	408,463	792,900	1,201,363
Other Recreation	15,406	29,905	45,311
Hunting:			
Big Game	148	592	740
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	3,501	6,796	10,297
Saltwater	0	0	0
Total Visitation	**1,083,527**	**2,103,621**	**3,187,148**

Regional Economic Analysis

The economic area for the Refuge is Comanche County, Oklahoma. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2011 are shown in

Table 2-58. Total expenditures were $91.2 million with non-residents accounting for $77.5 million or 85 percent of total expenditures.

Table 2-59 summarizes the local economic effects associated with recreation visits. Final demand totaled $113.2 million with associated employment of 1,053 jobs, $34.7 million in employment income and $13.0 million in total tax revenue.

Table 2-58. Wichita Mountains NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$13,642.3	$76,975.2	$90,617.6
Hunting	$5.9	$100.1	$106.1
Fishing	$59.8	$381.1	$440.9
Total Expenditures	**$13,708.1**	**$77,456.4**	**$91,164.5**

Table 2-59. Wichita Mountains NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$17,000.0	$96,200.0	$113,200.0
Jobs	178	875	1,053
Job Income	$5,300.0	$29,400.0	$34,700.0
Total Tax Revenue	$2,200.0	$10,800.0	$13,000.0

Table 2-60 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $44.57 means that for every $1 of budget expenditures, $44.57 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 2-60. Wichita Mountains NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Wichita Mountains NWR	$3,909.7	$91,164.5	$82,714.6	$44.47

Region 3

Region 3 for the U.S. Fish & Wildlife Service includes Iowa, Illinois, Indiana, Minnesota, Missouri, Michigan, Ohio, and Wisconsin. Sample refuges and management districts selected within this region include:

Agassiz NWR (Minnesota)
Big Oaks NWR (Indiana)
Crab Orchard NWR (Illinois)
Cypress Creek NWR (Illinois)
Horicon NWR (Wisconsin)
Illinois River NWR (Illinois)
Iowa WMD (Iowa)
Morris WMD (Minnesota)
Squaw Creek NWR (Missouri)
Two Rivers NWR (Illinois and Missouri)
Union Slough NWR (Iowa)
Upper Mississippi River NWFR (Minnesota, Wisconsin, Iowa, Illinois)

Agassiz National Wildlife Refuge

Description

Agassiz National Wildlife Refuge, established in 1937 as Mud Lake Refuge, was renamed in 1961 for this vast, ancient body of water – Glacial Lake Agassiz – that produced the exceedingly flat terrain that characterizes the area today. Located in northwestern Minnesota, the Refuge lies in the aspen parkland transitional zone between the coniferous or boreal forest to the north and east and the tallgrass prairie and prairie pothole provinces to the west and south. This diversity of habitats in turn supports a wide array of resident and migratory wildlife, including 300 species of birds, 50 species of mammals, 12 species of amphibians, and 9 species of reptiles.

The Refuge includes 26 impoundments (known variously as lakes, ponds,wetlands) and 3 natural lakes. Whiskey Lake and Kuriko Lake are located within the Refuge's designated Wilderness Area and Webster Lake is located in the northeast corner of the Refuge. The artificial impoundments vary widely in size, ranging from 30 acres to the approximately 10,000 acres that comprise Agassiz Pool. Water is contained within the impoundments by an extensive network of dikes. Water levels can be raised or lowered in any given impoundment by adjusting water control structures at pool outlets. The Refuge's dominant geographic features are its impoundments with their emergent marshes, mudflats, and open water. They are also the focus of the Refuge's aquatic habitat management efforts on behalf of migratory birds.

Agassiz NWR is a key breeding ground for 17 species of ducks and it is an important migration rest stop for waterfowl, and shorebirds. As many as 75,000 ducks, 15,000 geese and 1,500 sandhill cranes use the refuge as a migratory stopover site. It is also noted for two resident packs of gray wolves, moose, and nesting Bald Eagles.

Area Economy

Agassiz NWR is located in northwestern Minnesota. Table 3-1 shows the area economy. The area population increased by 1 percent from 2001 to 2011, compared with a 7 percent increase for Minnesota and a 9 percent increase for the U.S. as a whole. Area employment increased by 8 percent from 2001 to 2011, with Minnesota showing a 4 percent increase and the U.S. a 6 percent increase. Area per capita income increased by 26 percent over the 2001-2011 period, while Minnesota and the U.S. both increased by 5 percent.

Table 3-1. Agassiz NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Marshall MN	9.5	-5%	5.1	-6%	$41,968	36%
Pennington MN	14.1	5%	12.6	14%	$42,781	20%
Area Total	**23.6**	**1%**	**17.6**	**8%**	**$42,454**	**26%**
Minnesota	5,344.9	7%	3,461.4	4%	$44,560	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 3-2 shows the recreation visits for Agassiz NWR. The Refuge had 8,500 visits in 2011. Non-consumptive recreation accounted for 7,465 visits. Residents accounted for 44 percent of all Refuge visits.

Table 3-2. Agassiz NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	175	325	500
Auto Tour	2,700	3,300	6,000
Boat Trail/Launch	0	0	0
Bicycle	3	12	15
Interpretation	408	272	680
Photography	9	36	45
Other Recreation	135	90	225
Hunting:			
Big Game	250	750	1,000
Small Game	17	3	20
Migratory Birds	12	3	15
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	**3,709**	**4,791**	**8,500**

Regional Economic Analysis

The economic area for the Refuge is Marshall and Pennington Counties in Minnesota. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2011 are shown in Table 3-3. Total expenditures were $167,900 with non-residents accounting for $131,300 or 78 percent of total expenditures. Expenditures on non-consumptive activities accounted for 71 percent of all expenditures, hunting accounted for 29 percent.

Table 3-4 summarizes the local economic effects associated with recreation visits. Final demand totaled $202,400 with associated employment of 3 jobs, $57,800 in employment income and $27,100 in total tax revenue.

Table 3-3. Agassiz NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$30.1	$89.1	$119.2
Hunting	$6.5	$42.2	$48.7
Fishing	$0.0	$0.0	$0.0
Total Expenditures	**$36.6**	**$131.3**	**$167.9**

Table 3-4. Agassiz NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$45.8	$156.7	$202.4
Jobs	1	2	3
Job Income	$13.1	$44.7	$57.8
Total Tax Revenue	$6.2	$20.8	$27.1

Table 3-5 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $0.37 means that for every $1 of budget expenditures, $0.37 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 3-5. Agassiz NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Agassiz NWR	$940.6	$167.9	$184.7	$0.37

Big Oaks National Wildlife Refuge

Description

Big Oaks National Wildlife Refuge contains the largest unfragmented forested block in southeastern Indiana and some of the largest grassland areas within the region. Several large blocks of habitat types that are rare in the surrounding landscape are present within the boundaries of Big Oaks NWR. The National Wetland Inventory has estimated at least 6,400 acres of wetland on Big Oaks NWR. These size attributes all contribute to a substantial increase to the biodiversity of the Ohio River Ecosystem and the greater Midwest regional area. The refuge is located on approximately 50,000 acres of the former Department of Army's Jefferson Proving Ground located in Jefferson, Ripley, and Jennings Counties in southeastern Indiana. In a unique partnership with the US Army and Air Force, the Fish and Wildlife Service operates the refuge through a permit and Memorandum of Agreement. Large safety buffer areas separate the adjacent Air National Guard Range from public use areas of the refuge. The refuge provides managed habitat for 120 species of breeding birds, the federally endangered Indiana bat and 41 species of fish. The refuge has been designated as a Globally Important Bird Area because of a large breeding population of Henslow's sparrows. The refuge is home to white-tailed deer, wild turkey, river otters, bobcats and coyotes. Over 25 state-listed animal species and over 46 state listed plant species have been discovered to date on the refuge.

Big Oaks NWR contains 52 surveyed caves, portions of 6 stream corridors, and 165 acre Old Timbers Lake. Excellent fishing opportunities are available at Old Timbers Lake and hunting for white-tailed deer and wild turkey is permitted in designated areas for persons with appropriate refuge permits. Big Oaks NWR is located within 60 miles of 3 major metropolitan areas (i.e., Louisville, Cincinnati, and Indianapolis). Big Oaks is visited each year by 7,000 people for high quality wildlife observation, guided tours, hunting, and fishing, even though public use opportunities are limited.

Area Economy

Big Oaks NWR is located in southeastern Indiana. Table 3-6 shows the area economy. The area population increased by 2 percent from 2001 to 2011, compared with a 6 percent increase for Indiana and a 9 percent increase for the U.S. as a whole. Area employment decreased by 8 percent from 2001 to 2011, with Indiana showing no change and the U.S. a 6 percent increase. Area per capita income increased by 9 percent over the 2001-2011 period, while Indiana showed no change and the U.S. increased by 5 percent.

Table 3-6. Big Oaks NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Bartholomew IN	77.9	8%	54.7	8%	$39,645	7%
Jackson IN	43.0	4%	24.0	-7%	$32,941	7%
Jefferson IN	32.2	1%	16.5	-6%	$29,872	3%
Jennings IN	28.2	1%	10.2	-13%	$31,435	13%
Ripley IN	28.8	6%	16.2	-3%	$30,055	0%
Area Total	**103.4**	**2%**	**50.7**	**-8%**	**$69,785**	**9%**
Indiana	6,516.9	6%	3,577.6	0%	$35,689	0%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 3-7 shows the recreation visits for Big Oaks NWR. The Refuge had 8,075 visits in 2011. Non-consumptive recreation accounted for 2,075 visits. Residents accounted for 59 percent of all Refuge visits.

Table 3-7. Big Oaks NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	13	13	25
Auto Tour	0	0	0
Boat Trail/Launch	1,200	300	1,500
Bicycle	15	10	25
Interpretation	180	120	300
Photography	15	10	25
Other Recreation	160	40	200
Hunting:			
Big Game	1,750	1,750	3,500
Small Game	450	450	900
Migratory Birds	0	0	0
Fishing:			
Freshwater	960	640	1,600
Saltwater	0	0	0
Total Visitation	**4,743**	**3,333**	**8,075**

Regional Economic Analysis

The economic area for the Refuge is Bartholomew, Jackson, Jefferson, Jennings, and Ripley Counties in Indiana. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2011 are shown in Table 3-8. Total expenditures were $249,600 with non-residents accounting for $165,200 or 66 percent of total expenditures. Expenditures on hunting activities accounted for 65 percent of all expenditures, followed by fishing and non-consumptive activities at 25 percent and 10 percent, respectively.

Table 3-9 summarizes the local economic effects associated with recreation visits. Final demand totaled $332,200 with associated employment of 3 jobs, $99,300 in employment income and $44,800 in total tax revenue.

Table 3-8. Big Oaks NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$13.1	$11.2	$24.4
Hunting	$47.8	$114.7	$162.5
Fishing	$23.5	$39.2	$62.7
Total Expenditures	**$84.4**	**$165.2**	**$249.6**

Table 3-9. Big Oaks NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$112.0	$220.4	$332.3
Jobs	1	2	3
Job Income	$33.9	$65.4	$99.3
Total Tax Revenue	$15.1	$29.7	$44.8

Table 3-10 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $0.93 means that for every $1 of budget expenditures, $0.93 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 3-10. Big Oaks NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Big Oaks NWR	$646.9	$249.6	$354.9	$0.93

Crab Orchard National Wildlife Refuge

Description

Located west of Marion, Illinois, on the northern edge of the Ozark foothills, Crab Orchard National Wildlife Refuge is one of the largest refuges in the Great Lakes/Big Rivers Region. Established in 1947, the 43,890-acre Refuge includes three man-made lakes totaling 8,700 surface acres. The Refuge landscape also includes hardwood and pine forests, croplands, grasslands, wetlands, rolling hills, and rugged terrain with slopes of 24 percent. The 4,050-acre Crab Orchard Wilderness, the first wilderness area designated in the State of Illinois, is within the Refuge.

Crab Orchard Refuge is unique in the National Wildlife Refuge System in having an industrial program that generates $40 million annually to the local economy. Crab Orchard Refuge is also the only national wildlife refuge to have resident youth camps, such as those operated by Girl Scouts, Boy Scouts, and churches.

The Refuge hosts an estimated 750,000 visitors annually. Public use opportunities at the Refuge include an auto tour route, hiking trails, hunting, fishing, wildlife observation and photography, environmental education and interpretation, boating, swimming, camping, and picnicking.

Crab Orchard National Wildlife Refuge has four primary purposes:

Wildlife Conservation:
The Refuge exists to protect, enhance, and manage natural resources and the Refuge landscape through an ecosystem approach that sustains optimum populations of migratory waterfowl, native fish and wildlife species, and threatened and endangered wildlife.

Agriculture:
The Refuge seeks to provide opportunities for and encourage agricultural uses that help attain wildlife conservation goals, benefit the local economy, and are compatible with other Refuge purposes.

Industry:
The Refuge provides an industrial complex and attendant utility and transportation infrastructure, which conform to prescribed safety, health, environmental and maintenance standards.

Recreation:
The Refuge provides safe and equitable public use programs and facilities so that visitors have a wholesome, enjoyable recreational experience and gain an appreciation for fish and wildlife resources, natural and cultural history, outdoor ethics, and environmental awareness.

Area Economy

Crab Orchard NWR is located in southern Illinois near the Mississippi River. Table 3-11 shows the area economy. The area population and Illinois each increased by 3 percent from 2001 to 2011, compared with a 9 percent increase for the U.S. as a whole. Area employment increased by 2 percent from 2001 to 2011, with Illinois showing no change and the U.S. a 6 percent increase. Per capita income in the area increased by 12 percent over the 2001-2011 period, while Illinois and the U.S. increased by 4 and 5 percent respectively.

Table 3-11. Crab Orchard NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Franklin IL	39.6	2%	14.2	-5%	$29,656	7%
Jackson IL	60.4	1%	38.1	-1%	$33,213	14%
Johnson IL	12.7	-1%	4.4	2%	$25,920	13%
Union IL	17.7	-2%	7.1	-11%	$31,273	15%
Williamson IL	66.6	8%	34.5	11%	$33,674	11%
Area Total	**197.0**	**3%**	**98.5**	**2%**	**$32,010**	**12%**
Illinois	12,869.3	3%	7,349.1	0%	$43,721	4%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 3-12 shows the recreation visits for Crab Orchard NWR. The Refuge had 728,952 visits in 2011. Non-consumptive recreation accounted for 536,882 visits with residents comprising 65 percent of Refuge visitation.

Table 3-12. Crab Orchard NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	25,173	6,293	31,466
Auto Tour	176,946	95,279	272,225
Boat Trail/Launch	9,072	3,024	12,096
Bicycle	594	66	660
Interpretation	15,869	5,290	21,158
Photography	5,063	1,688	6,750
Other Recreation	96,264	96,264	192,527
Hunting:			
Big Game	3,153	3,153	6,305
Small Game	2,509	279	2,788
Migratory Birds	9,398	2,945	12,343
Fishing:			
Freshwater	127,976	42,659	170,634
Saltwater	0	0	0
Total Visitation	**472,015**	**256,937**	**728,952**

Regional Economic Analysis

The economic area for the Refuge is Franklin, Jackson, Johnson, Union, and Williamson Counties in Illinois. It is assumed that visitor expenditures occur primarily within this study area. Visitor recreation expenditures for 2011 are shown in Table 3-13. Total expenditures were $15.6 million with non-residents accounting for $9.7 million or 62 percent of total expenditures. Expenditures on non-consumptive activities accounted for 77 percent of all expenditures.

Table 3-14 summarizes the local economic effects associated with recreation visits. Final demand totaled $22.6 million with associated employment of 209 jobs, $6.8 million in employment income and $3.1 million in total tax revenue.

Table 3-13. Crab Orchard NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$4,030.9	$8,028.9	$12,059.8
Hunting	$307.9	$374.8	$682.8
Fishing	$1,563.3	$1,307.4	$2,870.7
Total Expenditures	**$5,902.1**	**$9,711.2**	**$15,613.3**

Table 3-14. Crab Orchard NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$8,500.0	$14,100.0	$22,600.0
Jobs	85	124	209
Job Income	$2,600.0	$4,200.0	$6,800.0
Total Tax Revenue	$1,200.0	$1,900.0	$3,100.0

Table 3-15 shows total economic effects (total recreation expenditures plus net economic value) compared with the district budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $14.26 means that for every $1 of budget expenditures, $14.26 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 3-15. Crab Orchard NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Crab Orchard NWR	$2,492.6	$15,613.3	$19,925.7	$14.26

Cypress Creek National Wildlife Refuge

Description

Visitors come for many reasons: some with classmates, some with parents, others with neighbors and some come alone. They come to explore and learn; they come to fish and hunt; they come to hike, paddle or to just sit and watch. What they all have in common is their interest to visit Cypress Creek National Wildlife Refuge in southernmost Illinois. The Refuge is part of a national system of lands and waters that provides a lifeline for millions of migratory birds and other wildlife. It includes rolling hills, bottomland forests, rivers, cypress swamps, and a diversity of wild places to enjoy.

The 16,000-acre Refuge is located in southern Illinois approximately 7 miles north of the confluence of the Ohio and Mississippi Rivers. The Refuge is located within the internationally significant Cache River watershed. While making up only 1.5 percent of the land area in Illinois, the Cache basin harbors 11.5 percent of the State's high-quality floodplain forests, and 91 percent of the State's high-quality swamp/wetland communities. The area provides many outdoor opportunities to hunt, fish, hike, canoe, and watch wildlife. Resource staff also offer guided tours and special events. Cache River Nature Fest, canoe tours of the old Cache Channel, hikes at Limekiln Springs or birding outings at Bellrose Waterfowl Reserve are just a few possibilities to explore the Refuge.

Area Economy

Cypress Creek NWR is located in southern Illinois. Table 3-16 shows the area economy. The area population increased by 2 percent from 2001 to 2011, compared with a 3 percent increase for Illinois and a 9 percent increase for the U.S. as a whole. Area employment increased by 2 percent from 2001 to 2011, with Illinois showing no change and the U.S. a 6 percent increase. Area per capita income increased by 14 percent over the 2001-2011 period, while Illinois and the U.S. increased by 4 and 5 percent respectively.

Table 3-16. Cypress Creek NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Alexander IL	8.0	-16%	2.8	-10%	$26,943	21%
Jackson IL	60.4	1%	38.1	-1%	$33,213	14%
Johnson IL	12.7	-1%	4.4	2%	$25,920	13%
Pulaski IL	6.0	-15%	2.8	-6%	$32,688	33%
Union IL	17.7	-2%	7.1	-11%	$31,273	15%
Williamson IL	66.6	8%	34.5	11%	$33,674	11%
Area Total	**171.4**	**2%**	**89.9**	**2%**	**$32,341**	**14%**
Illinois	12,869.3	3%	7,349.1	0%	$43,721	4%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 3-17 shows the recreation visits for Cypress Creek NWR. The Refuge had 25,300 visits in 2011. Non-consumptive recreation accounted for 15,175 visits with residents comprising 62 percent of Refuge visitation.

Table 3-17. Cypress Creek NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	1,500	1,000	2,500
Auto Tour	0	0	0
Boat Trail/Launch	1,080	120	1,200
Bicycle	0	0	0
Interpretation	2,210	390	2,600
Photography	385	165	550
Other Recreation	3,330	4,995	8,325
Hunting:			
Big Game	2,700	1,800	4,500
Small Game	1,200	300	1,500
Migratory Birds	600	525	1,125
Fishing:			
Freshwater	2,700	300	3,000
Saltwater	0	0	0
Total Visitation	**15,705**	**9,595**	**25,300**

Regional Economic Analysis

The economic area for the Refuge is Alexander, Johnson, Jackson, Pulaski, Union, and Williamson Counties in Illinois. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 3-18. Total expenditures were $494,600 with non-residents accounting for $303,600 or 61 percent of total expenditures. Expenditures on non-consumptive activities accounted for 49 percent of all expenditures.

Table 3-19 summarizes the local economic effects associated with recreation visits. Final demand totaled $710,500 with associated employment of 7 jobs, $214,600 in employment income and $96,500 in total tax revenue.

Table 3-18. Cypress Creek NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$79.4	$165.4	$244.8
Hunting	$78.6	$129.0	$207.6
Fishing	$33.0	$9.2	$42.2
Total Expenditures	**$191.0**	**$303.6**	**$494.6**

Table 3-19. Cypress Creek NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$272.7	$437.8	$710.5
Jobs	3	4	7
Job Income	$84.2	$130.4	$214.6
Total Tax Revenue	$38.7	$57.8	$96.5

Table 3-20 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $1.94 means that for every $1 of budget expenditures, $1.94 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 3-20. Cypress Creek NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Cypress Creek NWR	$595.6	$494.6	$661.7	$1.94

Horicon National Wildlife Refuge

Description

Horicon Marsh is the largest freshwater marsh of its kind in the United States consisting of 33,000 acres. The marsh is 14 miles long and 3 to 5 miles wide and has been classified as a palustrine system dominated by persistent emergent vegetation and floating vascular aquatic beds. The southern one-third of the marsh is managed by the Wisconsin Department of Natural Resources as a state wildlife area while the northern two-thirds of the marsh is managed by the U.S. Fish and Wildlife Service as the 22,000 acre Horicon National Wildlife Refuge. The marsh has been recognized as a Wetland of International Importance, a unit of the Ice Age National Scientific Reserve, and both a Globally and State Important Bird Area.

The Refuge was established in 1941 for the protection and preservation of migratory birds, specifically for the Redhead duck. The Refuge has the largest nesting concentration of Redheads east of the Mississippi River. The Refuge boasts hundreds of thousands of Canada geese and ducks during spring and fall migrations. Additionally another 300 species of birds, along with white-tailed deer, red fox, river otters, muskrats, snapping turtles, garter snakes, and more call the Refuge home.

Horicon Refuge attracts over 425,000 visitors annually. Visitors to Horicon Refuge can enjoy the auto tour, hiking, hunting, fishing, wildlife observation, wildlife photography, and environmental education.

Area Economy

Horicon NWR is located in southern Wisconsin. Table 3-21 shows the area economy. The area population increased by 4 percent from 2001 to 2011, compared with a 6 percent increase for Wisconsin and a 9 percent increase for the U.S. as a whole. Area employment showed no change from 2001 to 2011, with Wisconsin showing a 3 percent increase and the U.S. a 6 percent increase. Area per capita income increased by 3 percent over the 2001-2011 period, while Wisconsin and the U.S. increased by 4 and 5 percent respectively.

Table 3-21. Horicon NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Dodge WI	88.7	3%	48.4	2%	$35,086	5%
Fond Du Lac WI	102.1	4%	58.1	-1%	$36,897	0%
Area Total	**190.7**	**4%**	**106.5**	**0%**	**$36,055**	**3%**
Wisconsin	5,711.8	6%	3,475.0	3%	$39,575	4%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 3-22 shows the recreation visits for Horicon NWR. The Refuge had 392,199 visits in 2011. Non-consumptive recreation accounted for 378,297 visits with residents comprising 75 percent of Refuge visitation.

Table 3-22. Horicon NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	100,760	33,587	134,347
Auto Tour	147,940	49,313	197,253
Boat Trail/Launch	0	0	0
Bicycle	1,749	583	2,332
Interpretation	678	226	904
Photography	29,221	9,740	38,961
Other Recreation	0	4,500	4,500
Hunting:			
Big Game	5,826	647	6,473
Small Game	2,070	230	2,300
Migratory Birds	17	0	17
Fishing:			
Freshwater	4,601	511	5,112
Saltwater	0	0	0
Total Visitation	**292,861**	**99,338**	**392,199**

Regional Economic Analysis

The economic area for the Refuge is Dodge and Fond du Lac Counties in Wisconsin. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 3-23. Total expenditures were $6.3 million with non-residents accounting for $2.8 million or 45 percent of total expenditures. Expenditures on non-consumptive activities accounted for 96 percent of all expenditures.

Table 3-24 summarizes the local economic effects associated with recreation visits. Final demand totaled $9.0 million with associated employment of 88 jobs, $2.6 million in employment income and $1.2 million in total tax revenue.

Table 3-23. Horicon NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$3,208.7	$2,786.9	$5,995.6
Hunting	$158.1	$41.9	$200.1
Fishing	$56.2	$15.7	$71.9
Total Expenditures	**$3,423.0**	**$2,844.5**	**$6,267.5**

Table 3-24. Horicon NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$4,934.9	$4,035.2	$8,970.1
Jobs	51	37	88
Job Income	$1,455.1	$1,165.3	$2,620.4
Total Tax Revenue	$693.2	$541.7	$1,234.9

Table 3-25 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $12.06 means that for every $1 of budget expenditures, $12.06 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 3-25. Horicon NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Horicon NWR	$1,265.8	$6,267.5	$8,991.3	$12.06

Illinois River National Wildlife and Fish Refuges Complex

Description

The Illinois River National Wildlife and Fish Refuges Complex (NWFRC) is located along 124 miles of the Illinois River in west central Illinois. The NWFRC is a diverse mix of floodplain wetlands, bottomland forest, upland forest and prairie. NWFRC wetlands are designated as a "Ramsar Wetland of International Importance", "Important Bird Areas", and have been accepted into the "Western Hemisphere Shorebird Reserve Network".

Areas of the NWFRC serve as a temporary home to hundreds of thousands waterfowl that feed and rest on their annual spring and fall migration and provide habitat for 60 to 70 percent of the waterfowl that migrate along the Illinois River corridor. The mudflats and shallow water attract 30 species of shorebirds and 10 species of gulls and terns. The forested and grassland areas host over 150 species of songbirds. In addition to being important to migratory birds, the flooded wetlands serve as spawning and nursery habitat for a highly productive river fishery. Wetland areas also provide habitat for the federally listed Decurrent false aster and forests contain habitat suitable for the Indiana Bat. Osprey, an Illinois endangered species currently nest on NWFRC lands. Situated between Henry and Meredosia, refuge units are designated waypoints along the Illinois River Road National Scenic Byway. Visitors come to enjoy the wildlife and habitat resources and also learn about the rich culture and history of the area.

Area Economy

Illinois River NWFRC is located in west central Illinois. Table 3-26 shows the area economy. The area population increased by 3 percent from 2001 to 2011, compared with a 3 percent increase for Illinois and a 9 percent increase for the U.S. as a whole. Area employment showed no change from 2001 to 2011, with Illinois showing no change and the U.S. a 6 percent increase. Area per capita income increased by 13 percent over the 2001-2011 period, while Illinois and the U.S. increased by 4 and 5 percent respectively.

Table 3-26. Illinois River NWFRC: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Cass IL	13.6	-1%	8.2	4%	$33,988	8%
Fulton IL	37.0	-2%	13.3	-2%	$33,723	12%
Marshal IL	12.5	-3%	5.3	-5%	$41,192	15%
Mason IL	14.5	-9%	5.3	-15%	$38,136	17%
Morgan IL	35.5	-2%	18.8	-8%	$33,922	9%
Peoria IL	186.8	2%	124.0	0%	$45,375	21%
Sangamon IL	198.8	5%	131.5	-1%	$43,261	7%
Tazewell IL	135.7	6%	74.6	7%	$41,909	12%
Area Total	**634.4**	**3%**	**381.0**	**0%**	**$42,159**	**13%**
Illinois	12,869.3	3%	7,349.1	0%	$43,721	4%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 3-27 shows the recreation visits for Illinois River NWFRC. The Refuge had 18,388 visits in 2011. Non-consumptive recreation accounted for 12,290 visits with residents comprising 92 percent of Refuge visitation.

Table 3-27. Illinois River NWFRC: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	7,484	832	8,315
Auto Tour	0	0	0
Boat Trail/Launch	0	0	0
Bicycle	0	0	0
Interpretation	3,539	186	3,725
Photography	238	13	250
Other Recreation	0	0	0
Hunting:			
Big Game	1,188	63	1,250
Small Game	23	0	23
Migratory Birds	477	24	500
Fishing:			
Freshwater	3,893	433	4,325
Saltwater	0	0	0
Total Visitation	**16,839**	**1,549**	**18,388**

Regional Economic Analysis

The economic area for the **NWFRC** is the 8-county area described in Table 3-26. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in
Table 3-28. Total expenditures were $245,000 with non-residents accounting for $44,100 or 18 percent of total expenditures. Expenditures on non-consumptive activities accounted for 47 percent of all expenditures.

Table 3-29 summarizes the local economic effects associated with recreation visits. Final demand totaled $391,700 with associated employment of 4 jobs, $119,400 in employment income, and $52,800 in total tax revenue.

Table 3-28. Illinois River NWFRC: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$96.3	$19.7	$116.0
Hunting	$33.3	$4.5	$37.8
Fishing	$71.3	$19.9	$91.2
Total Expenditures	**$200.9**	**$44.1**	**$245.0**

Table 3-29. Illinois River NWFRC: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$321.5	$70.2	$391.7
Jobs	3	1	4
Job Income	$98.1	$21.3	$119.4
Total Tax Revenue	$43.7	$9.2	$52.8

Table 3-30 total economic effects (total recreation expenditures plus net economic value) compared with the NWFRC budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $0.97 means that for every $1 of budget expenditures, $0.97 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from NWFRC visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 3-30. Illinois River NWFRC: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Illinois River NWFRC	$728.9	$245.0	$461.0	$0.97

Iowa Wetland Management District

Description

The Iowa Wetland Management District was established in 1979 to provide breeding habitat for waterfowl, as well as nesting and migratory habitat for a wide array of other migratory birds. The Iowa Wetland Management District is very different from other wetland management districts in that the Iowa Department of Natural Resources (State) manages the day to day operations on many of the waterfowl productions areas. Together, the State and the U. S. Fish and Wildlife Service have been able to develop large complexes of habitat for waterfowl and other wildlife species within a predominantly agricultural landscape. Although the district boundary encompasses 35 counties, there are 75 waterfowl production areas in only 18 of these counties. Most acquisitions are intended to increase habitat at existing wetland complexes, so it is unlikely that tracts will be acquired in the entire 35-county area. The waterfowl production areas range in size from 35 acres to over 2,000 acres and provide over 25,000 total acres of habitat. In addition, waterfowl production areas within the district have been recognized as part of 12 Important Bird Areas as established by the Audubon Society and 5 Iowa Bird Conservation Areas as defined under the North American Bird Conservation Initiative.

Area Economy

Iowa WMD is located in northern Iowa. Table 3-31 shows the area economy. The area population increased by 9 percent from 2001 to 2011, compared with a 4 percent increase for Iowa and a 9 percent increase for the U.S. as a whole. Area employment increased by 4 percent from 2001 to 2011, with Iowa showing a 4 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 10 percent over the 2001-2011 period, while Iowa, and the U.S. increased by 16 and 5 percent respectively.

Table 3-31. Iowa WMD: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Boone IA	26.3	0%	13.7	1%	$40,920	15%
Buena Vista IA	20.4	1%	14.1	5%	$41,466	27%
Cerro Gordo IA	43.9	-4%	31.7	-4%	$41,225	16%
Clay IA	16.6	-4%	12.4	0%	$44,683	27%
Kossuth IA	15.4	-9%	10.5	1%	$52,330	56%
Polk IA	437.4	15%	336.7	7%	$45,336	5%
Webster IA	37.7	-6%	23.4	-7%	$39,467	21%
Area Total	**597.6**	**9%**	**442.5**	**4%**	**$44,500**	**10%**
Iowa	3,062.3	4%	1,970.5	4%	$41,156	16%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 3-32 shows the recreation visits for Iowa WMD. The Refuge had 76,839 visits in 2011. Non-consumptive recreation accounted for 19,427 visits with residents comprising 79 percent of Refuge visitation.

Table 3-32. Iowa WMD: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	1,090	121	1,211
Auto Tour	10,901	1,211	12,112
Boat Trail/Launch	0	0	0
Bicycle	545	61	606
Interpretation	0	0	0
Photography	588	65	653
Other Recreation	4,361	485	4,845
Hunting:			
Big Game	4,361	485	4,845
Small Game	28,827	12,354	41,181
Migratory Birds	9,158	1,018	10,175
Fishing:			
Freshwater	1,090	121	1,211
Saltwater	0	0	0
Total Visitation	**60,919**	**15,920**	**76,839**

Regional Economic Analysis

The economic area for the Refuge is the seven county area described in Table 3-31. It is assumed that visitor expenditures occur primarily within this study area. Visitor recreation expenditures for 2011 are shown in Table 3-33. Total expenditures were $565,100 with non-residents accounting for $223,900 or 40 percent of total expenditures. Expenditures on hunting activities accounted for 82 percent of all expenditures.

Table 3-34 summarizes the local economic effects associated with recreation visits. Final demand totaled $794,100 with associated employment of 8 jobs, $220,400 in employment income and $95,800 in total tax revenue.

Table 3-33. Iowa WMD: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$71.8	$20.0	$91.8
Hunting	$262.7	$202.1	$464.7
Fishing	$6.7	$1.9	$8.5
Total Expenditures	**$341.2**	**$223.9**	**$565.1**

Table 3-34. Iowa WMD: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$482.6	$311.5	$794.1
Jobs	5	3	8
Job Income	$134.2	$86.2	$220.4
Total Tax Revenue	$59.0	$36.8	$95.8

Table 3-35 shows total economic effects (total recreation expenditures plus net economic value) compared with the district budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $5.08 means that for every $1 of budget expenditures, $5.08 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 3-35. Iowa WMD: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Iowa WMD	$314.0	$565.1	$1,030.2	$5.08

Morris Wetland Management District

Description

The Morris Wetland Management District (WMD) is located in west-central Minnesota and is part of the prairie pothole region – the "duck factory" of North America. Historically, this region was part of an extensive grassland called the Northern Tallgrass Prairie which was interspersed with tens of thousands of wetlands. Today, less than one percent of the tallgrass prairie remains and over 90 percent of the prairie wetlands have been drained. For this reason, the wetlands and grasslands protected and restored by the district have become increasingly important "arks" of habitat for waterfowl and grassland wildlife. Approximately 80,000 acres of wetlands and grasslands are protected by 245 Waterfowl Production Areas (WPA's) and 800 easements which the district oversees. These lands are interspersed across eight counties.

The thousands of wetlands in the prairie pothole region were created approximately 10,000 years ago as glaciers retreated from the area, leaving a rolling topography of glacial moraines and extensive shallow lakes. Fertile soils created by native prairie plants and an abundance of wetlands and grasslands provide important breeding habitat for waterfowl as well as other wetland and grassland wildlife. Over 282 different species of birds may be encountered throughout the district, of which 137 species breed here, including 16 species of waterfowl and 29 species of other waterbirds. Mallards and blue-wing teal are the most common nesting ducks. In recent years, trumpeter swan and greater sandhill crane have begun nesting in portions of the district. Many bird species found only on grasslands such as the bobolink, upland sandpiper, and short-eared owl may be observed. Dakota Skipper and Poweshiek Skipper, proposed for listing as federally endangered/threatened species may also be found on WPA's with native prairie.

In addition to providing important habitat for waterfowl and grassland birds, the district also provides abundant hunting, fishing, and wildlife observation opportunities. Ducks, geese, and pheasant are the mostly commonly hunted species while northern pike is the most popular game fish sought on WPA's. Bird watching enthusiasts are rewarded with a spectacular spring waterfowl migration, with 28 different species migrating through the area. Spring and fall shorebird migrations can be particularly rewarding when the migration coincides with drought events which produce an abundance of exposed mud flats and shorelines.

Area Economy

Table 3-36 shows the area economy for Morris WMD. The area population decreased by 1 percent from 2001 to 2011, compared with a 7 percent increase for Minnesota and a 9 percent increase for the U.S. as a whole. Area employment increased by 4 percent from 2001 to 2011, with Minnesota showing a 4 percent increase and the U.S. a 6 percent increase. Area per capita income increased by 25 percent over the 2001-2011 period, while Minnesota and the U.S. both increased by 5 percent.

Table 3-36. Morris WMD: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Big Stone MN	5.2	-8%	3.3	5%	$39,621	25%
Chippewa MN	12.3	-4%	9.2	1%	$46,031	25%
Douglas MN	36.2	9%	25.8	11%	$37,703	11%
Kandiyohi MN	42.2	2%	30.1	5%	$42,769	19%
Lac qui Parle MN	7.2	-9%	4.8	-1%	$47,448	51%
Pope MN	10.9	-2%	6.6	5%	$43,039	30%
Stevens MN	9.7	-3%	6.8	6%	$43,547	34%
Swift MN	9.6	-14%	5.7	-8%	$39,923	42%
Traverse MN	3.5	-11%	2.2	0%	$46,368	50%
Yellow Medicine MN	10.3	-7%	6.1	-3%	$42,986	38%
Area Total	**147.1**	**-1%**	**100.6**	**4%**	**$41,900**	**25%**
Minnesota	5,344.9	7%	3,461.4	4%	$44,560	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 3-37 shows the recreation visits for Morris WMD. The Refuge had 72,870 visits in 2011. Hunting activities accounted for 69,400 visits with residents comprising 58 percent of Refuge visitation.

Table 3-37. Morris WMD: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	665	35	700
Auto Tour	900	225	1,125
Boat Trail/Launch	0	0	0
Bicycle	0	0	0
Interpretation	240	60	300
Photography	16	4	20
Other Recreation	820	205	1,025
Hunting:			
Big Game	2,700	2,700	5,400
Small Game	13,500	13,500	27,000
Migratory Birds	22,800	14,200	37,000
Fishing:			
Freshwater	285	15	300
Saltwater	0	0	0
Total Visitation	**41,926**	**30,944**	**72,870**

Regional Economic Analysis

The economic area for the WMD includes the 10 counties listed in Table 3-36. It is assumed that visitor expenditures occur primarily within these counties in Minnesota. Visitor recreation expenditures for 2011 are shown in Table 3-38. Total expenditures were $3.2 million with non-residents accounting for $2.2 million or 68 percent of total expenditures. Expenditures on hunting activities accounted for 99 percent of all expenditures.

Table 3-39 summarizes the local economic effects associated with recreation visits. Final demand totaled $4.5 million with associated employment of 40 jobs, $1.3 million in employment income and $600,000 in total tax revenue.

Table 3-38. Morris WMD: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$14.0	$6.7	$20.7
Hunting	$997.0	$2,197.1	$3,194.1
Fishing	$2.6	$0.3	$3.0
Total Expenditures	**$1,013.6**	**$2,204.2**	**$3,217.8**

Table 3-39. Morris WMD: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$1,385.1	$3,114.0	$4,499.1
Jobs	14	27	40
Job Income	$399.8	$886.9	$1,286.7
Total Tax Revenue	$195.8	$404.5	$600.3

Table 3-40 shows total economic effects (total recreation expenditures plus net economic value) compared with the WMD budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the WMD budget for 2011. The $5.45 means that for every $1 of budget expenditures, $5.45 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 3-40. Morris WMD: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Morris WMD	$1,226.4	$3,217.8	$3,460.4	$5.45

Squaw Creek National Wildlife Refuge

Description

Squaw Creek National Wildlife Refuge is located in Holt County in northwest Missouri, approximately midway between Kansas City, Missouri and Omaha, Nebraska, 2 ½ miles off Interstate Highway 29. This 7,415 acre refuge includes approximately 6,700 acres of floodplain that is managed as wetland, grassland and riparian habitats that attract up to 475 bald eagles, 300,000 snow geese and 200,000 ducks during the fall and winter seasons. During the spring, more than 1,000,000 snow geese concentrate on the refuge wetlands. The refuge lowlands were once a part of a large natural marsh in the Missouri River floodplain. Historically, this area was heavily used by waterfowl and other migratory birds during their spring and fall migrations. The refuge hosts 310 species of birds, 33 mammals and 35 reptiles and amphibians. Missouri's largest wet prairie remnant is on the refuge, and it is home to Missouri's largest meta-population of the Massassauga rattlesnake.

The almost 700 acres of refuge upland includes a segment of the 200-mile long band of hills known as the Loess Hills. The Loess Hills, formed by wind-deposited, silt-sized soil particles, are a geologic phenomenon unique to the Missouri River Valley. While loess deposits do exist elsewhere in North America and the world, only in the Missouri River Valley are the deposits deep enough to create such an extensive land form. The Loess Hills support rare remnants of native prairie and prairie associated wildlife.

Area Economy

Squaw Creek NWR is located in northwestern Missouri. Table 3-41 shows the area economy. The area population increased by 3 percent from 2001 to 2011, compared with a 7 percent increase for Missouri and a 9 percent increase for the U.S. as a whole. Area employment increased by 5 percent from 2001 to 2011, with Missouri showing a 1 percent increase and the U.S. a 6 percent increase. Area per capita income increased by 7 percent over the 2001-2011 period, while Missouri and the U.S. increased by 4 and 5 percent respectively.

Table 3-41. Squaw Creek NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Buchanan MO	89.7	4%	56.4	5%	$33,732	7%
Holt MO	4.8	-9%	2.7	3%	$36,631	18%
Area Total	**94.5**	**3%**	**59.0**	**5%**	**$33,880**	**7%**
Missouri	6,010.7	7%	3,495.6	1%	$37,969	4%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 3-42 shows the recreation visits for Squaw Creek NWR. The Refuge had 294,003 visits in 2011. Non-consumptive recreation accounted for 292,700 visits with residents comprising 65 percent of Refuge visitation.

Table 3-42. Squaw Creek NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	31,200	16,800	48,000
Auto Tour	120,250	64,750	185,000
Boat Trail/Launch	0	0	0
Bicycle	100	100	200
Interpretation	9,380	4,020	13,400
Photography	29,900	16,100	46,000
Other Recreation	65	35	100
Hunting:			
Big Game	203	0	203
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	990	110	1,100
Saltwater	0	0	0
Total Visitation	**192,088**	**101,915**	**294,003**

Regional Economic Analysis

The economic area for the Refuge is Buchanan and Holt Counties in Missouri. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 3-43. Total expenditures were $2.6 million with non-residents accounting for $1.5 million or 57 percent of total expenditures. Expenditures on non-consumptive activities accounted for 99 percent of all expenditures.

Table 3-44 summarizes the local economic effects associated with recreation visits. Final demand totaled $3.5 million with associated employment of 32 jobs, $1.0 million in employment income and $411,000 in total tax revenue.

Table 3-43. Squaw Creek NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$1,123.0	$1,499.0	$2,622.0
Hunting	$4.3	$0.0	$4.3
Fishing	$6.0	$1.7	$7.7
Total Expenditures	**$1,133.4**	**$1,500.7**	**$2,634.0**

Table 3-44. Squaw Creek NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$1,512.4	$1,953.1	$3,465.4
Jobs	15	17	32
Job Income	$434.2	$572.2	$1,006.4
Total Tax Revenue	$180.5	$230.5	$411.0

Table 3-45 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $7.13 means that for every $1 of budget expenditures, $7.13 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 3-45. Squaw Creek NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Squaw Creek NWR	$843.5	$2,634.0	$3,381.8	$7.13

Two Rivers National Wildlife Refuge

Description

Two Rivers National Wildlife Refuge was established in 1958 to protect and enhance habitat for migratory birds. Spanning 28 miles of the Mississippi River and nine miles of the Illinois River, Two Rivers NWR encompasses 9,225 acres of riverine and floodplain habitat scattered around the confluence.

The refuge includes six divisions – Calhoun, Gilbert Lake, Batchtown, Portage Island, Apple Creek and the Clarksville Island Division. The mosaic of wetlands, open water, flood plain forests and prairies provides habitat for numerous mammals, amphibians, reptiles, fish and birds. Two Rivers NWR functions as an important link for migratory birds that rest, feed, and winter along the main artery of the Mississippi Flyway. More than 200 different bird species funnel through this important river juncture on their semi-annual migration, including more than 5,000,000 ducks and 50,000 geese. Open water pools, backwater sloughs, small impoundments, wetland management units and a cooperative farming program all contribute to this objective. In addition, more than 1,000 Bald Eagles over-winter in the area and the refuge is one of the few remaining places where the *Boltonia decurrens* (decurrent false aster), a federally listed threatened plant, can still be found.

The Refuge offers public use opportunities and encourages wildlife dependent forms of recreation including hunting, fishing, wildlife observation and photography, interpretation, and environmental education.

Area Economy

Two Rivers NWR is located in on the border of Missouri and Illinois. Table 3-46 shows the area economy. The area population increased by 4 percent from 2001 to 2011, compared with a 3 and 7 percent increase for Illinois and Missouri and a 9 percent increase for the U.S. as a whole. Area employment increased by 1 percent from 2001 to 2011, with Illinois and Missouri showing no change and a 1 percent increase respectively, and the U.S. a 6 percent increase. Area per capita income increased by 3 percent over the 2001-2011 period, while Illinois and Missouri both increased by 4 percent and the U.S. increased by 5 percent.

Table 3-46. Two Rivers NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Calhoun IL	5.0	0%	2.2	2%	$33,613	12%
Greene IL	13.8	-6%	4.8	-8%	$31,573	18%
Jersey IL	22.9	5%	8.3	1%	$38,503	12%
Madison IL	268.5	3%	127.5	3%	$38,133	8%
St. Charles MO	365.2	24%	169.5	31%	$41,257	6%
St. Louis MO	998.7	-2%	741.8	-4%	$52,783	3%
Area Total	**1,674.1**	**4%**	**1,054.0**	**1%**	**$47,491**	**3%**
Illinois	12,869.3	3%	7,349.1	0%	$43,721	4%
Missouri	6,010.7	7%	3,495.6	1%	$37,969	4%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 3-47 shows the recreation visits for Two Rivers NWR. The Refuge had 11,070 visits in 2011. Non-consumptive recreation accounted for 7,945 visits with residents comprising 75 percent of Refuge visitation. Visitation in 2011 is lower than previous years due to limited access caused by extensive flooding of the Mississippi and Illinois Rivers.

Table 3-47. Two Rivers NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	1,978	848	2,825
Auto Tour	1,225	525	1,750
Boat Trail/Launch	160	40	200
Bicycle	32	8	40
Interpretation	1,995	855	2,850
Photography	182	98	280
Other Recreation	0	0	0
Hunting:			
Big Game	165	71	235
Small Game	86	10	95
Migratory Birds	28	7	35
Fishing:			
Freshwater	2,484	276	2,760
Saltwater	0	0	0
Total Visitation	**8,334**	**2,737**	**11,070**

Regional Economic Analysis

The economic area for the Refuge is Calhoun, Greene, Jersey, and Madison Counties in Illinois and St. Charles and St. Louis Counties in Missouri. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 3-48. Total expenditures were $87,800 with non-residents accounting for $53,200 or 41 percent of total expenditures. Expenditures on non-consumptive activities accounted for 61 percent of all expenditures.

Table 3-49 summarizes the local economic effects associated with recreation visits. Final demand totaled $159,600 million with associated employment of 1 job, $46,800 in employment income and $21,200 in total tax revenue.

Table 3-48. Two Rivers NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$25.8	$27.3	$53.2
Hunting	$3.0	$2.6	$5.5
Fishing	$22.8	$6.3	$29.1
Total Expenditures	**$51.5**	**$36.2**	**$87.8**

Table 3-49. Two Rivers NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$93.6	$66.0	$159.6
Jobs	1	0	1
Job Income	$27.6	$19.2	$46.8
Total Tax Revenue	$12.6	$8.6	$21.2

Table 3-50 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $0.41 means that for every $1 of budget expenditures, $0.41 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 3-50. Two Rivers NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Two Rivers NWR	$561.4	$87.8	$140.0	$0.41

Union Slough National Wildlife Refuge

Description

Union Slough National Wildlife Refuge was established by an Executive Order in 1938 designating the area as a migratory waterfowl refuge, with a purpose of providing a refuge and breeding ground for migratory birds and other wildlife. The Slough is all that remains of a pre-glacial riverbed. The name "Union" refers to the connection of two watersheds, the Blue Earth River and the east fork of the Des Moines River. Native Americans called this area Mini Akapan Kaduza, meaning "water which runs both ways". During the early settlement times, Union Slough covered 8,000 acres and was considered useless for farming. Many miles of drainage tile were installed and numerous ditches were constructed in this area to attempt to control water levels and improve the area for agriculture. In spite of these habitat changes, the area continued to support an abundance of waterfowl and wetland/upland wildlife species. Refuge uplands surrounding the Slough still contain remnant and restored tallgrass prairie stands, a rare commodity in an intensively cultivated area. Today, Union Slough National Wildlife Refuge encompasses 3,334 acres of both marsh and upland habitats.

Area Economy

Union Slough NWR is located in northern Iowa. Table 3-51 shows the area economy. The area population decreased by 6 percent from 2001 to 2011, compared with a 4 and 7 percent increase for Iowa and Minnesota and a 9 percent increase for the U.S. as a whole. Area employment decreased by 6 percent from 2001 to 2011, with Iowa and Minnesota both showing a 4 percent increase and the U.S. a 6 percent increase. Area per capita income increased by 27 percent over the 2001-2011 period, while Iowa, Minnesota, and the U.S. increased by 16, 5 and 5 percent respectively.

Table 3-51. Union Slough NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Cerro Gordo IA	43.9	-4%	31.7	-4%	$41,225	16%
Hancock IA	11.3	-6%	9.1	-11%	$43,929	30%
Kossuth IA	15.4	-9%	10.5	1%	$52,330	56%
Webster IA	37.7	-6%	23.4	-7%	$39,467	21%
Winnebago IA	10.8	-7%	6.3	-11%	$37,507	26%
Faribault MN	14.5	-9%	8.2	-9%	$46,913	49%
Area Total	**133.6**	**-6%**	**89.2**	**-6%**	**$42,555**	**27%**
Iowa	3,062.3	4%	1,970.5	4%	$41,156	16%
Minnesota	5,344.9	7%	3,461.4	4%	$44,560	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 3-52 shows the recreation visits for Union Slough NWR. The Refuge had 6,130 visits in 2011. Non-consumptive recreation accounted for 3,966 visits with residents comprising 66 percent of Refuge visitation.

Table 3-52. Union Slough NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	200	133	333
Auto Tour	2,040	1,360	3,400
Boat Trail/Launch	0	0	0
Bicycle	100	67	167
Interpretation	0	0	0
Photography	40	26	66
Other Recreation	0	0	0
Hunting:			
Big Game	147	16	163
Small Game	969	415	1,384
Migratory Birds	308	34	342
Fishing:			
Freshwater	248	28	275
Saltwater	0	0	0
Total Visitation	**4,050**	**2,080**	**6,130**

Regional Economic Analysis

The economic area for the Refuge is Faribault County, Minnesota and Cerro Gordo, Hancock, Kossuth, Webster, and Winnebago Counties in Iowa. It is assumed that visitor expenditures occur primarily within this study area. Visitor recreation expenditures for 2011 are shown in Table 3-53. Total expenditures were $38,200 with non-residents accounting for $20,100 or 53 percent of total expenditures. Expenditures on non-consumptive activities accounted for 54 percent of all expenditures.

Table 3-54 summarizes the local economic effects associated with recreation visits. Final demand totaled $72,200 with associated employment of 1 job, $20,900 in employment income and $6,400 in total tax revenue.

Table 3-53. Union Slough NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$7.7	$12.9	$20.7
Hunting	$8.8	$6.8	$15.6
Fishing	$1.5	$0.4	$1.9
Total Expenditures	**$18.1**	**$20.1**	**$38.2**

Table 3-54. Union Slough NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$45.8	$26.4	$72.2
Jobs	1	0	1
Job Income	$13.1	$7.8	$20.9
Total Tax Revenue	$3.1	$3.3	$6.4

Table 3-55 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $0.15 means that for every $1 of budget expenditures, $0.15 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 3-55. Union Slough NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Union Slough NWR	$648.2	$38.2	$57.5	$0.15

Upper Mississippi River National Wildlife & Fish Refuge

Description

The Upper Mississippi River National Wildlife and Fish Refuge was established by an Act of Congress on June 7, 1924 as a refuge and breeding place for migratory birds, fish, other wildlife, and plants. The Refuge encompasses approximately 240,000 acres of Mississippi River floodplain in a more-or-less continuous stretch of 261 river-miles from near Wabasha, Minnesota to near Rock Island, Illinois.

The 1924 act set forth the purposes of the Refuge as follows:

> a. as a refuge and breeding place for migratory birds included in the terms of the convention between the United States and Great Britain for the protection of migratory birds, concluded August 16, 1916, and
>
> b. to such extent as the Secretary of Agriculture* may by regulations prescribe, as a refuge and breeding place for other wild birds, game animals, fur-bearing animals, and for the conservation of wild flowers and aquatic plants, and
>
> c. to such extent as the Secretary of Commerce* may by regulations prescribe as a refuge and breeding place for fish and other aquatic animal life."

**changed to Secretary of the Interior pursuant to reorganization and transfer of functions in 1939 (16 USC 721-731)*

The Refuge is an invaluable natural legacy in a complex geopolitical landscape:

- A national scenic treasure – river, backwaters, islands, and forest framed by 500-foot high bluffs;
- Interface with four states, 70 communities, and two Corps of Engineers districts;
- A series of 11 navigation locks and dams within overall boundary;
- Represented by eight U.S. Senators and six U.S. Representatives;
- National Scenic Byways on both sides;
- 4.4 million annual visits, the most of any national wildlife refuge;
- Diverse wildlife: 306 species of birds, 119 species of fish, 57 species of mammals, and 44 species of freshwater mussels
- Designated a Globally Important Bird Area
    - Over 300 active bald eagle nests in recent years
    - A peak of up to 3,000 bald eagles during winter months
    - Approximately 5,000 heron and egret nests in up to 15 colonies
- Continentally Significant Migration Corridor/Flyway
    - Up to 40% of the continent's waterfowl use the river flyway during migration
    - Up to 50% of the world's canvasback ducks stop during fall migration
    - Up to 20% of the world's tundra swans stop during fall migration
- Designated a Wetland of International Importance by the Ramsar Convention on Wetlands.

The Refuge is divided into four districts for management, administrative, and public service effectiveness and efficiency. Each District receives an annual budget allocation in addition to the headquarters budget allocation. The Refuge is also divided geographically by river pools that correspond with the navigation

pools created by the series of locks and dams on the Upper Mississippi River. District offices are located in Winona, Minnesota (pools 4, 5, 5A and 6); LaCrosse, Wisconsin (pools 7 and 8); McGregor, Iowa (pools 9, 10 and 11) and Savanna, Illinois (pools 12, 13 and 14). The Refuge currently has 40 full-time employees and an annual base operations and maintenance budget of $5 million.

The Refuge has an overall headquarters in Winona, Minnesota which provides administrative, biological, mapping, visitor services, planning and policy support to the districts. District managers are supervised by the refuge manager located in Winona. Two other national wildlife refuges, Trempealeau and Driftless Area, are also part of the Refuge Complex and are coordinated by the refuge manager in Winona.

Area Economy

Upper Mississippi River NWFR is located along a portion of the Mississippi River floodplain in the states of Illinois, Iowa, Minnesota, and Wisconsin. Table 3-56 shows the area economy. The county area population increased by 2 percent from 2001 to 2011, compared with a 5 percent increase for the 4-state area and a 9 percent increase for the U.S. as a whole. County area employment increased by 2 percent from 2001 to 2011, with the 4-state area showing a 2 percent increase and the U.S. a 6 percent increase. Per capita income in the county area increased by 15 percent over the 2001-2011 period, while the 4-state area and the U.S. both increased by 5 percent.

Table 3-56. Upper Mississippi River NWFR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Allamakee IA	14.3	0%	8.8	-6%	$35,588	17%
Clayton IA	18.0	-3%	11.0	-3%	$38,662	24%
Clinton IA	49.0	-2%	30.3	6%	$39,340	22%
Dubuque IA	94.6	6%	68.3	12%	$38,886	14%
Jackson IA	19.8	-2%	9.9	-6%	$36,099	22%
Scott IA	167.1	6%	108.3	3%	$46,372	21%
Carroll IL	15.2	-8%	7.2	-7%	$35,880	6%
Jo Daviess IL	22.7	1%	12.7	-6%	$42,456	13%
Rock Island IL	147.6	-1%	91.5	-4%	$39,132	13%
Whiteside IL	58.4	-4%	27.4	-7%	$37,306	18%
Houston MN	18.9	-5%	8.8	-1%	$40,554	12%
Wabasha MN	21.6	-1%	9.5	-6%	$39,457	8%
Winona MN	51.4	3%	31.4	0%	$35,049	10%
Buffalo WI	13.5	-2%	9.2	-3%	$40,436	7%
Crawford WI	16.7	-2%	12.1	3%	$32,425	13%
Grant WI	51.2	3%	27.9	3%	$33,569	9%
La Crosse WI	115.6	7%	83.6	5%	$37,796	8%
Trempealeau WI	29.0	7%	17.5	9%	$34,761	10%
Vernon WI	30.0	6%	14.5	11%	$30,094	13%
County Area Total	**954.5**	**2%**	**589.7**	**2%**	**$39,017**	**15%**
Iowa	3,062.3	4%	1,970.5	4%	$41,156	16%
Illinois	12,869.3	3%	7,349.1	0%	$43,721	4%
Minnesota	5,344.9	7%	3,461.4	4%	$44,560	5%
Wisconsin	5,711.8	6%	3,475.0	3%	$39,575	4%
State Area Total	**26,988.2**	**5%**	**16,256.0**	**2%**	**$42,719**	**5%**
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 3-57 shows the recreation visits for Upper Mississippi River NWR. The Refuge had 4.4 million visits in 2011. Non-consumptive recreation accounted for 2.6 million visits with residents comprising 6 percent of Refuge visitation.

Table 3-57. Upper Mississippi River NWFR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	181,728	20,192	201,920
Auto Tour	7,714	406	8,120
Boat Trail/Launch	126,393	54,168	180,561
Bicycle	15,107	6,475	21,582
Interpretation	88,308	37,846	126,154
Photography	148,367	63,586	211,953
Other Recreation	569,880	1,329,720	1,899,600
Hunting:			
Big Game	36,849	15,792	52,641
Small Game	3,555	2,370	5,925
Migratory Birds	66,996	100,494	167,490
Fishing:			
Freshwater	1,405,300	156,144	1,561,444
Saltwater	0	0	0
Total Visitation	**2,650,196**	**1,787,194**	**4,437,390**

Regional Economic Analysis

The economic area for the Refuge is a 19-county area across 4 States. It is assumed that visitor expenditures occur primarily within this study area. Visitor recreation expenditures for 2011 are shown in Table 3-58. Total expenditures were $101.9 million with non-residents accounting for $69.3 million or 68 percent of total expenditures. Expenditures on non-consumptive activities accounted for 68 percent of all expenditures.

Table 3-59 summarizes the local economic effects associated with recreation visits. Final demand totaled $161.4 million with associated employment of 1,394 jobs, $47.0 million in employment income and $20.4 million in total tax revenue.

Table 3-58. Upper Mississippi River NWFR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$13,140.0	$56,682.5	$69,822.5
Hunting	$2,385.1	$7,789.9	$10,175.0
Fishing	$17,166.4	$4,785.6	$21,952.1
Total Expenditures	**$32,691.5**	**$69,258.1**	**$101,949.6**

Table 3-59. Upper Mississippi River NWFR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$51,900.0	$109,500.0	$161,400.0
Jobs	485	909	1,394
Job Income	$15,500.0	$31,500.0	$47,000.0
Total Tax Revenue	$6,800.0	$13,600.0	$20,400.0

Table 3-60 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $45.64 means that for every $1 of budget expenditures, $45.64 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 3-60. Upper Mississippi River NWFR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Upper Mississippi River NWFR	$4,943.1	$101,949.6	$123,656.6	$45.64

Region 4

Region 4 for the U.S. Fish & Wildlife Service includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Puerto Rico, South Carolina, and Tennessee. Sample refuges selected within this region include:

Alligator River NWR(North Carolina)
Arthur R. Marshall Loxahatchee NWR (Florida)
Cache River NWR (Florida)
Chickasaw NWR (Tennessee)
Crystal River NWR (Florida)
Egmont Key NWR (Florida)
Felsenthal NWR (Arkansas)
Hobe Sound NWR (Florida)
Lower Hatchie NWR (Tennessee)
Merritt Island NWR (Florida)
Okefenokee NWR (Arkansas)
Pea Island NWR (North Carolina)
Pocosin Lakes NWR (North Carolina)
Santee NWR (South Carolina)
St. Marks NWR (Florida)
Waccamaw NWR (South Carolina)

Alligator River National Wildlife Refuge

Description

Alligator River National Wildlife Refuge was established on March 14, 1984. It contains 152,195 acres which lie on the mainland portions of Dare and Hyde Counties, North Carolina. The Refuge is roughly 28 miles from north to south and 15 miles from east to west. It is bordered on the west by the Alligator River and the Intracoastal Waterway; on the north by Albemarle Sound; on the east by Croatan and Pamlico Sounds; and on the south by Long Shoal River and corporate farmland.

Alligator River Refuge was established to preserve and protect a unique wetland habitat type - the pocosin - and its associated wildlife species. The diversity of habitat types includes high and low pocosin, bogs, fresh and brackish water marshes, hardwood swamps, and Atlantic white cedar swamps. Considered among the last remaining strongholds for black bear in eastern North Carolina and on the mid-Atlantic Coast, the Refuge also provides valuable habitat for concentrations of ducks, geese, and swans; wading birds, shorebirds, American woodcock, raptors, American alligators, white-tailed deer, raccoons, rabbits, quail, river otters, red-cockaded woodpeckers, and migrating songbirds. It serves as the core area for re-establishing the red wolf back into the wild.

Area Economy

Table 4-1 shows the area economy for Alligator River NWR. The area population increased by 16 percent from 2001 to 2011, compared with a 18 percent increase for North Carolina and a 9 percent increase for the U.S. as a whole. Area employment increased by 13 percent from 2001 to 2011, with North Carolina showing a 9 percent increase and the U.S. a 6 percent increase. Area per capita income increased by 5 percent over the 2001-2011 period, while North Carolina showed no change and the U.S. increased by 5 percent.

Table 4-1. Alligator River NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Currituck NC	24.0	28%	9.0	33%	$39,949	14%
Dare NC	34.3	11%	27.6	9%	$38,633	0%
Hyde NC	5.8	2%	3.2	4%	$29,572	9%
Area Total	**64.1**	**16%**	**39.8**	**13%**	**$38,302**	**5%**
North Carolina	9,656.4	18%	5,262.9	9%	$36,028	0%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 4-2 shows the recreation visits for Alligator River NWR. The Refuge had 51,793 visits in 2011. Non-consumptive recreation accounted for 46,238 visits with residents comprising 53 percent of Refuge visitation.

Table 4-2. Alligator River NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	1,800	1,800	3,600
Auto Tour	1,800	1,800	3,600
Boat Trail/Launch	8,800	13,200	22,000
Bicycle	40	60	100
Interpretation	8,147	3,491	11,638
Photography	1,050	1,050	2,100
Other Recreation	1,600	1,600	3,200
Hunting:			
Big Game	1,280	320	1,600
Small Game	320	80	400
Migratory Birds	444	111	555
Fishing:			
Freshwater	2,100	900	3,000
Saltwater	0	0	0
Total Visitation	**27,381**	**24,412**	**51,793**

Regional Economic Analysis

The economic area for the Refuge is Currituck, Dare, and Hyde Counties in North Carolina. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 4-3. Total expenditures were $1.3 million with non-residents accounting for $1.1 million or 84 percent of total expenditures. Expenditures on non-consumptive activities accounted for 95 percent of all expenditures.

Table 4-4 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.8 million with associated employment of 17 jobs, $567,000 in employment income and $174,300 in total tax revenue.

Table 4-3. Alligator River NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$173.7	$1,099.1	$1,272.8
Hunting	$20.3	$15.3	$35.6
Fishing	$15.8	$15.4	$31.1
Total Expenditures	**$209.8**	**$1,129.7**	**$1,339.6**

Table 4-4. Alligator River NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$298.2	$1,525.1	$1,823.3
Jobs	3	14	17
Job Income	$96.7	$470.3	$567.0
Total Tax Revenue	$46.1	$128.2	$174.3

Table 4-5 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $0.31 means that for every $1 of budget expenditures, $0.31 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 4-5. Alligator River NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Alligator River NWR	$7,122.9	$1,339.6	$899.5	$0.31

Arthur R. Marshall Loxahatchee National Wildlife Refuge

Description

Arthur R. Marshall Loxahatchee National Wildlife Refuge is 143,924 acres in size, protecting the last remaining portion of the unique northern Everglades. The Refuge protects endangered species such as the snail kite, wood stork, and tropical curly grass fern. The Refuge also protects species like the American alligator, red-bellied turtle and dahoon holly The Refuge is comprised of five different habitat types: tree islands, wet prairies, sloughs, sawgrass communities, and the largest remnant cypress swamp in Palm Beach County. The Refuge offers wintering habitat for migratory waterfowl and nesting or foraging habitat for wading birds and shorebirds. The Refuge offers bird watching, hiking, biking, boating, environmental education, wildlife photography, interpretation, fishing, and waterfowl hunting. Boat ramps are available at all three Refuge entrances Headquarters Area, Hillsboro Area, and 20-Mile Bend.

An observation tower, observation platform, fishing platform, and nature trails are found at the Headquarters Area. The 0.4 mile Cypress Swamp Boardwalk trail meanders where visitors can see several types of ferns and lichens as well as the majestic cardinal wild pine. The 0.8 mile Marsh Trail is an open levee trail that's a bird watcher's paradise where wading birds, shorebirds, and migratory waterfowl can be seen. Visitors get a close-up and personal view of the Refuge along the 5.5 mile canoe trail beginning at the Headquarters Area. The Visitor Center has state-of-the-arts exhibits and an introductory Refuge video. The Refuge Calendar of Events offers guided bird, butterfly and plant walks, guest lecturers, and an annual art and photo contest from November through April. The Refuge bird list boasts 257 bird species that use the Refuge as a migration, wintering, or breeding area. Situated in Palm Beach County, Florida, the Refuge is within 100 miles of 6 million people. Arthur R. Marshall Loxahatchee National Wildlife Refuge is visited each year by over 300,000 people who come to enjoy and learn about this fragile ecosystem. The Refuge provides environmental education programs for 5,000 school children every year.

Area Economy

Table 4-6 shows the area economy for Arthur R. Marshall Loxahatchee NWR. The area population increased by 15 percent from 2001 to 2011, compared with a 17 percent increase for Florida and a 9 percent increase for the U.S. as a whole. Area employment increased by 11 percent from 2001 to 2011, with Florida showing a 12 percent increase and the U.S. a 6 percent increase. Area per capita income decreased by 4 percent over the 2001-2011 period, while Florida and the U.S. both increased by 5 percent.

Table 4-6. Arthur R. Marshall Loxahatchee NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Palm Beach FL	1,335.2	15%	742.5	11%	$53,500	-4%
Florida	19,057.5	17%	10,008.7	12%	$39,636	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 4-7 shows the recreation visits for Arthur R. Marshall Loxahatchee NWR. The Refuge had 306,866 visits in 2011. Non-consumptive recreation accounted for 259,901 visits with residents comprising 65 percent of Refuge visitation.

Table 4-7. Arthur R. Marshall Loxahatchee NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	84,302	36,129	120,431
Auto Tour	0	0	0
Boat Trail/Launch	57,855	38,570	96,425
Bicycle	1,590	84	1,674
Interpretation	377	126	503
Photography	24,521	16,347	40,868
Other Recreation	0	0	0
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	318	56	374
Fishing:			
Freshwater	30,284	16,307	46,591
Saltwater	0	0	0
Total Visitation	**199,247**	**107,619**	**306,866**

Regional Economic Analysis

The economic area for the Refuge is West Palm Beach, Florida. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2011 are shown in Table 4-8. Total expenditures were $10.3 million with non-residents accounting for $7.8 million or 76 percent of total expenditures. Expenditures on non-consumptive activities accounted for 92 percent of all expenditures.

Table 4-9 summarizes the local economic effects associated with recreation visits. Final demand totaled $15.3 million with associated employment of 107 jobs, $4.5 million in employment income and $1.9 million in total tax revenue.

Table 4-8. Arthur R. Marshall Loxahatchee NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$2,069.4	$7,360.5	$9,429.9
Hunting	$9.2	$4.0	$13.2
Fishing	$378.7	$464.2	$842.9
Total Expenditures	**$2,457.3**	**$7,828.7**	**$10,285.9**

Table 4-9. Arthur R. Marshall Loxahatchee NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$3,660.4	$11,591.6	$15,252.0
Jobs	27	80	107
Job Income	$1,111.0	$3,437.8	$4,548.8
Total Tax Revenue	$479.7	$1,439.6	$1,919.2

Table 4-10 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $6.81 means that for every $1 of budget expenditures, $6.81 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 4-10. Arthur R. Marshall Loxahatchee NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Arthur R. Marshall Loxahatchee NWR	$2,826.6	$10,285.9	$8,969.5	$6.81

Cache River National Wildlife Refuge

Description

Cache River National Wildlife Refuge (NWR) was established in 1986 to protect significant wetland habitats and provide feeding and resting areas for migrating waterfowl.

As one of the few remaining areas in the Lower Mississippi River Valley not drastically altered by channelization and drainage, the Cache River basin contains a variety of wetland communities including some of the most intact and least disturbed bottomland hardwood forests in the Mississippi Valley region. These unique and valuable wetlands have been protected by the RAMSAR Convention as a Wetland of International Importance. The refuge has been identified as the most important wintering area for Mallard ducks in North America and is a critical component of the Arkansas's "Big Woods" – the largest tract of bottomland hardwood forest in the Lower Mississippi River Valley. The refuge is nationally acclaimed as a waterfowl hunting and wildlife observation area.

At present the refuge currently encompasses over 68,500 acres located in numerous non-contiguous tracts in Jackson, Woodruff, Monroe and Prairie counties in east central Arkansas. The boundary of this refuge changes frequently as land acquisition continues along the Cache River, White River and Bayou DeView.

Area Economy

Cache River NWR is located in eastern Arkansas. Table 4-11 shows the area economy. The area population increased by 6 percent from 2001 to 2011, compared with a 9 percent increase for Arkansas and a 9 percent increase for the U.S. as a whole. Area employment increased by 4 percent from 2001 to 2011, with Arkansas showing a 5 percent increase and the U.S. a 6 percent increase. Area per capita income increased by 10 percent over the 2001-2011 period, while Arkansas and the U.S. increased by 11 and 5 percent respectively.

Table 4-11. Cache River NWR:
Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Jackson AR	17.9	-1%	7.9	-9%	$31,055	11%
Monroe AR	8.1	-19%	3.5	-18%	$31,733	21%
Prairie AR	8.6	-9%	3.0	-10%	$31,744	19%
Pulaski AR	386.3	6%	311.1	5%	$43,938	9%
St. Francis AR	28.0	-4%	11.1	-6%	$26,373	19%
White AR	78.2	14%	36.8	10%	$29,624	12%
Woodruff AR	7.2	-17%	3.1	-16%	$31,375	21%
Area Total	**534.2**	**6%**	**376.5**	**4%**	**$39,942**	**10%**
Arkansas	2,938.0	9%	1,552.6	5%	$33,740	11%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 4-12 shows the recreation visits for Cache River NWR. The Refuge had 381,510 visits in 2011. Recreation was fairly evenly divided between non-consumptive, hunting, and fishing activities. Residents comprising 92 percent of Refuge visitation.

Table 4-12. Cache River NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	0	0	0
Auto Tour	0	0	0
Boat Trail/Launch	99,000	11,000	110,000
Bicycle	0	0	0
Interpretation	99	11	110
Photography	2,250	750	3,000
Other Recreation	900	100	1,000
Hunting:			
Big Game	47,500	2,500	50,000
Small Game	23,750	1,250	25,000
Migratory Birds	51,380	9,020	60,400
Fishing:			
Freshwater	125,400	6,600	132,000
Saltwater	0	0	0
Total Visitation	**350,279**	**31,231**	**381,510**

Regional Economic Analysis

The economic area for the Refuge is Jackson, Monroe, Prairie, Pulaski, St. Francis, White, and Woodruff Counties in Arkansas. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 4-13. Total expenditures were $6.8 million with non-residents accounting for $1.7 million or 25 percent of total expenditures. Expenditures on hunting activities accounted for 46 percent of all expenditures.

Table 4-14 summarizes the local economic effects associated with recreation visits. Final demand totaled $11.8 million with associated employment of 100 jobs, $3.6 million in employment income and $1.5 million in total tax revenue.

Table 4-13. Cache River NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$1,111.3	$816.5	$1,927.8
Hunting	$2,424.6	$736.2	$3,160.8
Fishing	$1,568.3	$187.9	$1,756.1
Total Expenditures	**$5,104.1**	**$1,740.6**	**$6,844.7**

Table 4-14. Cache River NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$8,810.6	$2,985.9	$11,796.5
Jobs	77	23	100
Job Income	$2,670.4	$901.1	$3,571.5
Total Tax Revenue	$1,106.3	$357.5	$1,463.9

Table 4-15 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 4-15. Cache River NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Cache River NWR	NA	$6,844.7	$12,269.6	$19,114.3

Chickasaw National Wildlife Refuge

Description

Chickasaw National Wildlife Refuge encompasses 25,882 acres and lies in the Lower Mississippi River floodplain along the Chickasaw Bluff in western Tennessee. Many of the major ecological communities found in the Lower Mississippi Alluvial Valley Ecosystem can be found on the refuge. When visiting the refuge a person can explore extensive bottomland hardwood forest (the largest block of bottomland hardwood forest in Tennessee is on Chickasaw NWR); riverine habitat of streams, oxbow lakes, and sloughs; open grasslands managed for migratory birds; sandy grassland savannahs along the Mississippi River; and a remarkable upland bluff ecotone.

Chickasaw Refuge is famous for the more than 270 migratory bird species that use the refuge for migration, wintering, or breeding. The refuge provides migration and wintering habitat for waterfowl, shorebirds, songbirds, and raptors. The refuge and adjacent lands are known to be important wintering and stop-over areas for a large portion of the Mississippi Flyway mallard population. Under optimum conditions, peak waterfowl numbers may exceed 320,000 including black ducks, gadwall, pintail, teal, wigeon, wood duck, ring-necked duck, and hooded merganser. Situated between Dyersburg, TN and Memphis, TN and within 60 miles of more than 1 million people, Chickasaw Refuge is visited each year by more than 75,000 people who come to enjoy and learn about these sensitive natural resources.

Area Economy

Table 4-16 shows the area economy for Chickasaw NWR. The area population increased by 5 percent from 2001 to 2011, compared with a 11 percent increase for Tennessee and a 9 percent increase for the U.S. as a whole. Area employment showed no change from 2001 to 2011, with Tennessee showing a 5 percent increase and the U.S. a 6 percent increase. Area per capita income decreased by 2 percent over the 2001-2011 period, while Tennessee and the U.S. both increased by 5 percent.

Table 4-16. Chickasaw NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Dyer TN	38.2	3%	21.1	-7%	$32,333	4%
Lauderdale TN	27.7	1%	8.7	-17%	$23,033	1%
Madison TN	98.3	6%	66.9	2%	$35,315	7%
Shelby TN	935.1	4%	624.0	1%	$40,763	-3%
Tipton TN	61.3	16%	15.8	3%	$34,959	16%
Area Total	**1,160.6**	**5%**	**736.6**	**0%**	**$39,294**	**-2%**
Tennessee	6,403.4	11%	3,591.3	5%	$36,567	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 4-17 shows the recreation visits for Chickasaw NWR. The Refuge had 73,175 visits in 2011. Hunting activities accounted for the majority of visits (49 percent), followed by non-consumptive activities (44 percent) and fishing activities (7 percent). Residents comprised 90 percent of Refuge visitation.

Table 4-17. Chickasaw NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	7,740	860	8,600
Auto Tour	2,700	300	3,000
Boat Trail/Launch	450	50	500
Bicycle	0	0	0
Interpretation	17,820	1,980	19,800
Photography	113	13	125
Other Recreation	0	0	0
Hunting:			
Big Game	7,515	835	8,350
Small Game	17,010	1,890	18,900
Migratory Birds	7,600	800	8,400
Fishing:			
Freshwater	4,950	550	5,500
Saltwater	0	0	0
Total Visitation	**65,898**	**7,278**	**73,175**

Regional Economic Analysis

The economic area for the Refuge is Dyer, Lauderdale, Madison, Shelby, and Tipton Counties in Tennessee. It is assumed that visitor expenditures occur primarily within this 5-county study area. Visitor recreation expenditures for 2011 are shown in Table 4-18. Total expenditures were $1.7 million with non-residents accounting for $494,900 or 28 percent of total expenditures. Expenditures on hunting activities accounted for 65percent of all expenditures.

Table 4-19 summarizes the local economic effects associated with recreation visits. Final demand totaled $3.2 million with associated employment of 25 jobs, $968,200 in employment income and $389,500 in total tax revenue.

Table 4-18. Chickasaw NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$274.6	$195.3	$470.0
Hunting	$852.6	$274.6	$1,127.1
Fishing	$99.0	$25.0	$124.1
Total Expenditures	$1,226.2	$494.9	$1,721.2

Table 4-19. Chickasaw NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$2,266.5	$909.4	$3,175.8
Jobs	18	7	25
Job Income	$696.5	$271.7	$968.2
Total Tax Revenue	$282.4	$107.2	$389.5

Table 4-20 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 4-20. Chickasaw NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Chickasaw NWR	NA	1,721.2	$2,988.5	$4,700.7

Crystal River National Wildlife Refuge

Description

Crystal River National Wildlife Refuge, located about 70 miles north of Tampa, was established in 1983 for the protection of the West Indian manatee, an endangered species. Crystal River NWR is found within Kings Bay, the second largest spring system in Florida. The Refuge totals 127 acres including 46 acres of islands and water bottoms within Kings Bay, the headwaters of the Crystal River. The Refuge includes 7 manatee sanctuaries where manatees concentrate from November through February in the warm water springs which remain 72 degrees year-round.

Crystal River is famous for hosting over 550 manatees each winter, using the Refuge springs for conserving energy during the cold spells. More than 150,000 visitors visit the Refuge just to have some kind of experience near manatees. Another 50,000 plus visitors use Kings Bay for other recreational and non-recreational purposes.

Area Economy

Table 4-21 shows the area economy for Crystal River NWR. The area population increased by 24 percent from 2001 to 2011, compared with a 17 percent increase for Florida and a 9 percent increase for the U.S. as a whole. Area employment increased by 11 percent from 2001 to 2011, with Florida showing a 12 percent increase and the U.S. a 6 percent increase. Area per capita income increased by 4 percent over the 2001-2011 period, while Florida and the U.S. both increased by 5 percent.

Table 4-21. Crystal River NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Citrus FL	140.0	16%	48.8	14%	$32,675	11%
Hillsborough FL	1,267.8	23%	757.6	5%	$39,180	5%
Marion FL	332.5	26%	130.5	17%	$32,709	8%
Orange FL	1,169.1	25%	836.1	16%	$35,990	2%
Area Total	**2,909.4**	**24%**	**1,773.0**	**11%**	**$36,845**	**4%**
Florida	19,057.5	17%	10,008.7	12%	$39,636	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 4-22 shows the recreation visits for Crystal River NWR. The Refuge had 429,500 visits in 2011. Non-consumptive activities accounted for the majority of visits (99 percent). The resident versus non-resident composition depends on the type of activity enjoyed at the Refuge. Most visitors using the boat ramps are tourists who enter the Refuge via boat ramps using Dive Shop boats. However, the majority of

fishing visits are by local residents that enjoy the opportunities in Kings Bay. Residents also predominately take part in pedestrian activities and other recreation opportunities (i.e., scalloping, water skiing, etc.)

Table 4-22. Crystal River NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	6,650	2,850	9,500
Auto Tour	0	0	0
Boat Trail/Launch	18,250	164,250	182,500
Bicycle	0	0	0
Interpretation	15,950	143,550	159,500
Photography	5,500	49,500	55,000
Other Recreation	16,200	1,800	18,000
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	4,000	1,000	5,000
Saltwater	0	0	0
Total Visitation	**66,550**	**362,950**	**429,500**

Regional Economic Analysis

The economic area for the Refuge is Citrus, Hillsborough, Marion, and Orange Counties in Florida. It is assumed that visitor expenditures occur primarily within this 4-county study area. Visitor recreation expenditures for 2011 are shown in Table 4-23. Total expenditures were $24.2 million with non-residents accounting for $23.6 million or 97 percent of total expenditures.

Table 4-24 summarizes the local economic effects associated with recreation visits. Final demand totaled $38.1 million with associated employment of 278 jobs, $11.5 million in employment income and $4.6 million in total tax revenue.

Table 4-23. Crystal River NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$637.1	$23,595.7	$24,232.8
Hunting	$0.0	$0.0	$0.0
Fishing	$20.0	$11.4	$31.4
Total Expenditures	**$657.1**	**$23,607.1**	**$24,264.2**

Table 4-24. Crystal River NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$1,027.2	$37,108.9	$38,136.1
Jobs	8	270	278
Job Income	$313.5	$11,135.0	$11,448.6
Total Tax Revenue	$130.3	$4,494.8	$4,625.1

Table 4-25 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 4-25. Crystal River NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Crystal River NWR	NA	$24,264.2	$10,056.0	$34,320.2

Egmont Key National Wildlife Refuge

Description

Egmont Key National Wildlife Refuge is located at the mouth of Florida's largest open-water estuary, where Tampa Bay meets the Gulf of Mexico. Designated as an "Estuary of National Significance", the bay hosts a diverse network of habitats – mudflats, sea grass beds, and mangroves, essential for an abundance of wildlife.

Nature and history flourish at Egmont Key in an area where development dominates the landscape. Established in 1974 and currently co-managed with the Florida Park Service (under the Florida Department of Environmental Protection), Egmont Key NWR protects the nesting grounds to thousands of sea birds and endangered loggerhead sea turtles, as well as the stop-over site to neo-tropical migrants. A spectacular view of the Refuge can be appreciated from the edge of two designated wildlife sanctuaries during nesting season. These sanctuaries – closed to public access year round – allow the nesting colonies of brown pelicans, white ibis, laughing gulls, royal and sandwich terns, among other species, to nest successfully without human disturbance; it is from the edge that thousands of birds can be seen going about their parent duties to their chicks. The island also supports abundant gopher tortoises that may be seen around open areas feeding on grass sea grapes, and prickly pear cactus.

History is also an integral part of Egmont Key; it is because of Egmont Key's unique past that the island was incorporated to the National Register of Historic Places as it also protects the remains of historic Fort Dade and a well-over 100 year old (and still functioning) lighthouse. Egmont Key was used by the military as a holding facility for prisoners during the Seminole Indian War as well as during the Civil War. Soon after, when the Spanish American War was declared in 1898, the U.S. Army commenced construction on Egmont Key to what became the Fort Dade Military Reservation. Although the Spanish never came, 70 buildings were constructed as part of a coastal defense plan. Fort Dade was a small military garrison of some 300 residents until 1929 when it was deactivated. Remnants of a carriage road, sidewalks, several gun batteries and the guardhouse remain today to remind visitors of this island's unique past.

Egmont Key is a site not to be missed when visiting the Tampa Bay area. The Refuge is accessible only by boat and transportation to Egmont Key may be arranged through commercial ferry operators in the area.

Area Economy

Table 4-26 shows the area economy for Egmont Key NWR. The area population increased by 12 percent from 2001 to 2011, compared with a 17 percent increase for Florida and a 9 percent increase for the U.S. as a whole. Area employment increased by 2 percent from 2001 to 2011, with Florida showing a 12 percent increase and the U.S. a 6 percent increase. Area per capita income increased by 5 percent over the 2001-2011 period, while Florida and the U.S. also both increased by 5 percent.

Table 4-26. Egmont Key NWR:
Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Hillsborough FL	1,267.8	23%	757.6	5%	$39,180	5%
Pinellas FL	917.4	-1%	527.5	-3%	$44,622	8%
Area Total	**2,185.2**	**12%**	**1,285.1**	**2%**	**$41,465**	**5%**
Florida	19,057.5	17%	10,008.7	12%	$39,636	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 4-27 shows the recreation visits for Egmont Key NWR. The Refuge had visits in 441,600 in 2011. Non-consumptive recreation accounted for 361,600 visits with residents comprising 47 percent of Refuge visitation.

Table 4-27. Egmont Key NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	62,500	62,500	125,000
Auto Tour	0	0	0
Boat Trail/Launch	72,000	18,000	90,000
Bicycle	0	0	0
Interpretation	4,140	460	4,600
Photography	5,400	600	6,000
Other Recreation	0	136,000	136,000
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	0	0	0
Saltwater	64,000	16,000	80,000
Total Visitation	**208,040**	**233,560**	**441,600**

Regional Economic Analysis

The economic area for the Refuge is Hillsborough and Pinellas Counties in Florida. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in
Table 4-28. Total expenditures were $7.9 million with non-residents accounting for nearly $5.0 million or 63 percent of total expenditures. Expenditures on non-consumptive activities accounted for 76 percent of all expenditures.

Table 4-29 summarizes the local economic effects associated with recreation visits. Final demand totaled $15.1 million with associated employment of 114 jobs, $4.6 million in employment income and $1.9 million in total tax revenue.

Table 4-28. Egmont Key NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$1,392.4	$4,613.1	$6,005.5
Hunting	$0.0	$0.0	$0.0
Fishing	$1,478.3	$369.6	$1,847.8
Total Expenditures	**$2,870.7**	**$4,982.7**	**$7,853.3**

Table 4-29. Egmont Key NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$5,564.9	$9,576.0	$15,140.9
Jobs	44	70	114
Job Income	$1,709.7	$2,866.8	$4,576.4
Total Tax Revenue	$726.0	$1,184.1	$1,910.1

Table 4-30 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 4-30. Egmont Key NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Egmont Key NWR	NA	$7,853.3	$6,481.4	$14,334.8

Felsenthal National Wildlife Refuge

Description

Established in 1975, Felsenthal National Wildlife Refuge is located in southeast Arkansas, approximately eight miles west of the town of Crossett. Named for a small community located at its southwest corner, this 65,000 acre refuge contains an abundance of water resources dominated by the Ouachita and Saline Rivers and the Felsenthal Pool.

This low lying area is dissected by an intricate system of rivers, creeks, sloughs, buttonbush swamps and lakes throughout a vast bottomland hardwood forest that gradually rises to an upland forest community. Historically, periodic flooding of the "bottoms" during winter and spring provided excellent wintering waterfowl habitat. These wetlands, in combination with the pine and upland hardwood forest on the higher ridges, support a wide diversity of native plants and animals.

Area Economy

Table 4-31 shows the area economy for Felsenthal NWR. The area population decreased by 7 percent from 2001 to 2011, compared with a 9 percent increase for Arkansas and a 9 percent increase for the U.S. as a whole. Area employment decreased by 10 percent from 2001 to 2011, with Arkansas showing a 5 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 19 percent over the 2001-2011 period, while Arkansas and the U.S. increased by 11 and 5 percent respectively.

Table 4-31. Felsenthal NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Ashley AR	21.7	-9%	11.0	-9%	$34,789	20%
Bradley AR	11.5	-8%	5.0	-9%	$30,467	18%
Drew AR	18.5	-1%	9.1	0%	$31,086	14%
Union AR	41.4	-8%	23.8	-14%	$42,335	20%
Area Total	**93.1**	**-7%**	**48.8**	**-10%**	**$36,880**	**19%**
Arkansas	2,938.0	9%	1,552.6	5%	$33,740	11%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 4-32 shows the recreation visits for Felsenthal NWR. The Refuge had 424,550 recreation visits in 2011. Non-consumptive recreation accounted for 41,550 visits with residents comprising 62 percent of Refuge visitation.

Table 4-32. Felsenthal NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	100	400	500
Auto Tour	1,500	6,000	7,500
Boat Trail/Launch	12,600	5,400	18,000
Bicycle	0	0	0
Interpretation	250	250	500
Photography	25	25	50
Other Recreation	7,500	7,500	15,000
Hunting:			
Big Game	6,000	24,000	30,000
Small Game	4,600	18,400	23,000
Migratory Birds	56,000	24,000	80,000
Fishing:			
Freshwater	175,000	75,000	250,000
Saltwater	0	0	0
Total Visitation	**263,575**	**160,975**	**424,550**

Regional Economic Analysis

The economic area for the Refuge is Ashley, Bradley, Drew, and Union Counties in Arkansas. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 4-33. Total expenditures were about $16.6 million with non-residents accounting for $10.4 million or 63 percent of total expenditures. Expenditures on hunting activities accounted for 48 percent of all expenditures.

Table 4-34 summarizes the local economic effects associated with recreation visits. Final demand totaled $19.6 million with associated employment of 198 jobs, $5.8 million in employment income and $5.2 million in total tax revenue.

Table 4-33. Felsenthal NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$271.6	$1,412.1	$1,683.7
Hunting	$2,410.0	$5,560.9	$7,970.9
Fishing	$3,501.7	$3,415.9	$6,917.5
Total Expenditures	**$6,183.3**	**$10,388.9**	**$16,572.2**

Table 4-34. Felsenthal NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$7,231.3	$12,380.1	$19,631.7
Jobs	80	118	198
Job Income	$2,159.3	$3,615.5	$5,773.7
Total Tax Revenue	$2,332.5	$2,980.4	$5,230.4

Table 4-35 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 4-35. Felsenthal NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Felsenthal NWR	NA	$16,572.2	$22,677.7	$39,250.0

Hobe Sound National Wildlife Refuge

Description

Hobe Sound National Wildlife Refuge is located on Florida's southeastern coast and supports a biologically rich and diverse array of habitats including imperiled sand pine scrub, coastal hammock, mature red mangrove forest, and Atlantic coast beach and dune system. The beach and dune ecosystems of the Jupiter Island tract are considered one of the most important areas for nesting sea turtles along the Atlantic coast, supporting over 2,000 sea turtle nests annually on its 3.5 miles of unspoiled beaches. Shorebirds also utilize the Refuge's beach complex where colonies of least terns occasionally nest and rear young during the spring/summer nesting season. The Refuge's beach complex has been designated as a National Natural Landmark because of its national significance as one of the best examples of beach and dune system remaining in Florida.

In addition to providing habitat for nesting sea turtles and shorebirds, Hobe Sound NWR manages approximately 200 acres of Atlantic coastal scrub habitat where over half of the species that occupy scrub are found in no other habitat type. Atlantic coastal scrub provides habitat for a wide array of migratory birds in addition to a diversity of State and Federally listed species including gopher tortoise, Florida scrub-jay, and eastern indigo snake. Approximately 95 percent of Florida's pre-European scrub habitat has been replaced by agriculture and development. What remains is an extremely rare and distinct system of plants and animals where more endangered or potentially endangered wildlife species occur than in any other habitat type in Florida.

Situated just north of Palm Beach County along Florida's Atlantic coast and within 100 miles of more than 4 million people, Hobe Sound NWR is visited each year by approximately 150,000 people who come to enjoy and learn about these sensitive natural resources. The refuge provides environmental education programs for over 25,000 school children every year and environmental outreach programs delivered to local schools, organizations, clubs, and professional associations reach over 20,000 persons annually.

Area Economy

Table 4-36 shows the area economy for Hobe Sound NWR. The area population increased by 15 percent from 2001 to 2011, compared with a 17 percent increase for Florida and a 9 percent increase for the U.S. as a whole. Area employment increased by 12 percent from 2001 to 2011, with Florida showing a 12 percent increase and the U.S. a 6 percent increase. Per capita income in the area decreased by 4 percent over the 2001-2011 period, while Florida and the U.S. both increased by 5 percent.

Table 4-36. Hobe Sound NWR:
Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Martin FL	147.5	14%	86.6	16%	$52,798	-4%
Palm Beach FL	1,335.2	15%	742.5	11%	$53,500	-4%
Area Total	**1,482.7**	**15%**	**829.1**	**12%**	**$53,430**	**-4%**
Florida	19,057.5	17%	10,008.7	12%	$39,636	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 4-37 shows the recreation visits for Hobe Sound NWR. The Refuge had 107,400 visits in 2011. Non-consumptive recreation accounted for 97,900 visits with residents comprising 66 percent of Refuge visitation.

Table 4-37. Hobe Sound NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	17,500	7,500	25,000
Auto Tour	0	0	0
Boat Trail/Launch	90	10	100
Bicycle	4,950	550	5,500
Interpretation	18,000	12,000	30,000
Photography	1,960	840	2,800
Other Recreation	20,700	13,800	34,500
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	0	0	0
Saltwater	7,600	1,900	9,500
Total Visitation	**70,800**	**36,600**	**107,400**

Regional Economic Analysis

The economic area for the Refuge is Martin and Palm Beach Counties in Florida. It is assumed that visitor expenditures occur primarily within these two counties. Visitor recreation expenditures for 2011 are shown in Table 4-38. Total expenditures were $1.6 million with non-residents accounting for nearly $1.2 million or 72 percent of total expenditures. Expenditures on non-consumptive activities accounted for 91 percent of all expenditures.

Table 4-39 summarizes the local economic effects associated with recreation visits. Final demand totaled $2.5 million with associated employment of 17 jobs, $737,600 in employment income and $310,300 in total tax revenue.

Table 4-38. Hobe Sound NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$336.7	$1,142.8	$1,479.6
Hunting	$0.0	$0.0	$0.0
Fishing	$117.0	$29.3	$146.3
Total Expenditures	**$453.8**	**$1,172.1**	**$1,625.8**

Table 4-39. Hobe Sound NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$689.3	$1,774.8	$2,464.0
Jobs	5	12	17
Job Income	$211.1	$526.5	$737.6
Total Tax Revenue	$90.9	$219.4	$310.3

Table 4-40 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $9.88 means that for every $1 of budget expenditures, $9.88 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 4-40. Hobe Sound NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Hobe Sound NWR	$296.7	$1,625.8	$1,306.3	$9.88

Lower Hatchie National Wildlife Refuge

Description

Lower Hatchie National Wildlife Refuge encompasses 12,270 acres and lies at the confluence of the Hatchie and Mississippi Rivers. The refuge is located in the Lower Mississippi River floodplain along the Chickasaw Bluff in western Tennessee. Many of the major ecological communities found in the Lower Mississippi Alluvial Valley Ecosystem can be found on the refuge. When visiting the refuge a person can explore extensive bottomland hardwood forest; riverine habitat of streams, oxbow lakes, and sloughs; open grasslands managed for migratory birds; sandy grassland savannahs along the Mississippi River; and a remarkable upland bluff ecotone.

Lower Hatchie Refuge is famous for the more than 270 migratory bird species that use the refuge for migration, wintering, or breeding. The refuge provides migration and wintering habitat for waterfowl, shorebirds, songbirds, and raptors. The refuge and adjacent lands are known to be important wintering and stop-over areas for a large portion of the Mississippi Flyway mallard population. Under optimum conditions, peak waterfowl numbers may exceed 150,000 including black ducks, gadwall, pintail, teal, wigeon, wood duck, ring-necked duck, and hooded merganser. Situated between Dyersburg, TN and Memphis, TN and within 60 miles of more than 1 million people, Lower Hatchie Refuge is visited each year by more than 70,000 people who come to enjoy and learn about these sensitive natural resources.

Area Economy

Lower Hatchie NWR is located in western Tennessee. Table 4-41 shows the area economy. The area population increased by 5 percent from 2001 to 2011, compared with an 11 percent increase for Tennessee and a 9 percent increase for the U.S. as a whole. Area employment showed no change from 2001 to 2011, with Tennessee showing a 5 percent increase and the U.S. a 6 percent increase. Per capita income in the area decreased by 2 percent over the 2001-2011 period, while Tennessee and the U.S. both increased by 5 percent.

Table 4-41. Lower Hatchie NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Dyer TN	38.2	3%	21.1	-7%	$32,333	4%
Lauderdale TN	27.7	1%	8.7	-17%	$23,033	1%
Madison TN	98.3	6%	66.9	2%	$35,315	7%
Shelby TN	935.1	4%	624.0	1%	$40,763	-3%
Tipton TN	61.3	16%	15.8	3%	$34,959	16%
Area Total	**1,160.6**	**5%**	**736.6**	**0%**	**$39,294**	**-2%**
Tennessee	6,403.4	11%	3,591.3	5%	$36,567	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 4-42 shows the recreation visits for Lower Hatchie NWR. The Refuge had 65,050 visits in 2011. Non-consumptive recreation accounted for 35,600 visits (55 percent). Hunting and fishing activities had a similar number of visits with 14,200 and 15,250 visits, respectively. Residents comprised 90 percent of Refuge visitation.

Table 4-42. Lower Hatchie NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	900	100	1,000
Auto Tour	18,450	2,050	20,500
Boat Trail/Launch	4,590	510	5,100
Bicycle	0	0	0
Interpretation	7,200	800	8,000
Photography	900	100	1,000
Other Recreation	0	0	0
Hunting:			
Big Game	5,490	610	6,100
Small Game	4,905	545	5,450
Migratory Birds	2,395	255	2,650
Fishing:			
Freshwater	13,725	1,525	15,250
Saltwater	0	0	0
Total Visitation	**58,555**	**6,495**	**65,050**

Regional Economic Analysis

The economic area for the Refuge is Dyer, Lauderdale, Madison, Shelby, and Tipton Counties in Tennessee. It is assumed that visitor expenditures occur primarily within this 5-county area. Visitor recreation expenditures for 2011 are shown in Table 4-43. Total expenditures were $1.9 million with non-residents accounting for $623,700 or 33 percent of total expenditures. Expenditures on non-consumptive activities accounted for 57 percent of all expenditures.

Table 4-44 summarizes the local economic effects associated with recreation visits. Final demand totaled $3.3 million with associated employment of 29 jobs, $1.1 million in employment income and $400,600 in total tax revenue.

Table 4-43. Lower Hatchie NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$620.6	$441.3	$1,061.9
Hunting	$341.2	$112.9	$454.1
Fishing	$274.6	$69.5	$344.1
Total Expenditures	**$1,236.4**	**$623.7**	**$1,860.1**

Table 4-44. Lower Hatchie NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$2,216.5	$1,116.6	$3,333.7
Jobs	20	9	29
Job Income	$746.8	$376.7	$1,123.5
Total Tax Revenue	$272.6	$128.0	$400.6

Table 4-45 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 4-45. Lower Hatchie NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Lower Hatchie NWR	NA	$1,860.1	$3,254.0	$5,114.1

Merritt Island National Wildlife Refuge

Description

Merritt Island National Wildlife Refuge, located along Florida's east central coast about 40 miles east of the city of Orlando, was established by agreement as an overlay of the National Aeronautics and Space Administration's John F. Kennedy Space Center in 1963. The refuge covers more than 140,000 acres and lies within one of the most productive estuaries in the country, the Indian River Lagoon, which has more species of plants and animals than any other estuary in North America. The National Park Service and the U.S. Fish and Wildlife Service co-manage 34,000 acres of the refuge. The refuge is located on one of the last extensive undeveloped barrier islands on the eastern coast of Florida. A wide array of habitats exist on the refuge, including the beach and dune system, estuarine waters, forested and nonforested wetlands, impounded wetlands and coastal scrub and forests. These diverse habitats support more than 1,000 species of plants and more than 500 species of fish and wildlife, including a variety of waterfowl, shorebirds, and neotriopical migratory birds, as well as 9 federally-listed species that are common to the Refuge and 6 species that occur infrequently. More than 300 species of birds (resident and migratory) have been identified using the refuge. Popular with anglers, kayakers, birders, wildlife enthusiasts, and photographers, Merritt Island National Wildlife Refuge has the distinction of being one of the most visited refuges in the National Wildlife Refuge System with more than 1.1 million visitors per year. The partnership between space technology and abundant natural resources define the uniqueness of the Merritt Island National Wildlife Refuge.

Area Economy

Table 4-46 shows the area economy for Merritt Island NWR. The area population increased by 18 percent from 2001 to 2011, compared with a 17 percent increase for Florida and a 9 percent increase for the U.S. as a whole. Area employment increased by 13 percent from 2001 to 2011, with Florida showing a 12 percent increase and the U.S. a 6 percent increase . Per capita income in the area increased by 4 percent over the 2001-2011 period, while Florida and the U.S. both increased by 5 percent. (Note: in late 2011, more than 8,000 NASA workers in Brevard County were laid off due to the retirement of the space shuttle. A 2002 – 2012 timeframe would be a more accurate reflection of the impact of the layoffs but 2012 data is not currently available for all the categories in Table 4-46).

Table 4-46. Merritt Island NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Brevard FL	543.6	12%	261.6	6%	$38,028	6%
Orange FL	1,169.1	25%	836.1	16%	$35,990	2%
Volusia FL	494.8	10%	198.9	9%	$33,436	5%
Area Total	**2,207.5**	**18%**	**1,296.6**	**13%**	**$35,919**	**4%**
Florida	19,057.5	17%	10,008.7	12%	$39,636	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 4-47 shows the recreation visits for Merritt Island NWR. The Refuge had nearly 1.2 million visits in 2011. Non-consumptive recreation accounted for 1.0 million visits with residents comprising 42 percent of Refuge visitation.

Table 4-47. Merritt Island NWR: 2011 Recreation Visits

Activity		Residents	Non-Residents	Total
Non-Consumptive:				
	Pedestrian	110,517	165,776	276,293
	Auto Tour	79,242	118,863	198,105
	Boat Trail/Launch	7,000	7,000	14,000
	Bicycle	1,120	480	1,600
	Interpretation	7,200	4,800	12,000
	Photography	21,149	31,724	52,873
	Other Recreation	180,673	271,010	451,683
Hunting:				
	Big Game	0	0	0
	Small Game	0	0	0
	Migratory Birds	1,525	269	1,794
Fishing:				
	Freshwater	11,670	5,002	16,672
	Saltwater	83,361	83,361	166,721
Total Visitation		**503,457**	**688,284**	**1,191,741**

Regional Economic Analysis

The economic area for the Refuge is Brevard, Orange, and Volusia Counties in Florida. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 4-48. Total expenditures were $39.1 million with non-residents accounting for $32.1 million or 82 percent of total expenditures. Expenditures on non-consumptive activities accounted for 79 percent of all expenditures.

Table 4-49 summarizes the local economic effects associated with recreation visits. Final demand totaled $60.4 million with associated employment of 466 jobs, $18.1 in employment income and $7.5 million in total tax revenue.

Table 4-48. Merritt Island NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$2,997.8	$28,027.8	$31,025.6
Hunting	$44.0	$19.1	$63.1
Fishing	$4,026.0	$4,021.7	$8,047.8
Total Expenditures	**$7,067.8**	**$32,068.7**	**$39,136.5**

Table 4-49. Merritt Island NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$10,949.2	$49,492.6	$60,441.8
Jobs	91	375	466
Job Income	$3,298.5	$14,778.8	$18,077.3
Total Tax Revenue	$1,415.5	$6,055.7	$7,471.2

Table 4-50 shows total economic effects (total recreation expenditures plus net economic value) compared with the Refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated Refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the Refuge budget for 2011. The $17.61 means that for every $1 of budget expenditures, $17.61 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 4-50. Merritt Island NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Merritt Island NWR	$3,614.5	$39,136.5	$24,522.9	$17.61

Okefenokee National Wildlife Refuge

Description

Okefenokee National Wildlife Refuge Okefenokee NWR, located about 11 miles southwest of Folkston, was established in 1937 to preserve the 438,000 acre Okefenokee Swamp. The refuge encompasses approximately 403,000 acres with 353,000 acres designated as a National Wilderness Area.

Swamp habitats include open wet "prairies," cypress forests, scrub-shrub vegetation, upland islands, and open lakes. Wildlife species include wading birds, ducks, alligators and other reptiles, a variety of amphibians, bobcats, raptors, white-tailed deer, black bears, and songbirds.

The swamp has a rich human history including Native American occupation, early settlers, a massive drainage attempt, and intensive timber harvesting. Glimpses of the past are visible at Chesser Island Homestead, Billy's Island, Floyd's Island, and Suwannee Canal.

The prosperity and survival of the swamp, and the species dependent on it, is directly tied with maintaining the integrity of complex ecological processes, including hydrology and fire.

The Okefenokee Swamp is one of the world's largest intact freshwater ecosystems. It has been designated a Wetland of International Importance by the United Nations under the Ramsar Convention of 1971. The swamp is compared through research to wetlands worldwide. It is world-renowned for its amphibian populations that are bio-indicators of global health. Water from the Suwannee River Sill area is used as a standard reference by scientists throughout the world.

Refuge staff manages 33,000 acres of uplands which are being restored to once-abundant longleaf pine and wiregrass habitat. Species of concern in this community include red-cockaded woodpeckers, gopher tortoises, and indigo snakes.

The wilderness canoe trails in the Okefenokee National Wildlife Refuge offer a unique experience in a National Wilderness Area. There are multiple trails available for varying degrees of experience; from one to five days in length. Each trail provides abundant opportunities for viewing wildlife. Visitors from around the world leave with treasured memories. Alligators glide through the water stained dark with tannic acid. Herons and sandhill cranes wade through tall grasses and water lilies. Bears meander through hammocks and islands. Okefenokee National Wildlife Refuge is a haven for these and other animals.

Canoeing, kayaking, and motorboating are permitted year-round on marked trails. Of the 120 miles of boat trails in the swamp, 70 are also open to day-use motorboats under 10 horsepower. The refuge concessionaire, Okefenokee Adventures, and rangers at Stephen C. Foster State park provide motorboat tours plus canoe, kayak, and motorboat rentals. Visitor activities also include camping, hiking, nature photography, fishing, hunting, plus guided interpretive and environmental education activities.

Area Economy

Okefenokee NWR is located in on the border of Georgia and Florida. Table 4-51 shows the area economy. The area population increased by 11 percent from 2001 to 2011, compared with a 17 percent increase for both Florida and Georgia and a 9 percent increase for the U.S. as a whole. Area employment increased by 9 percent from 2001 to 2011, with Florida and Georgia showing a 12 and 10 percent increase respectively, and the U.S. a 6 percent increase. Per capita income in the area decreased by 1 percent over

the 2001-2011 period, while Florida increased by 5 percent, Georgia decreased by 3 percent, and the U.S. increased 5 percent.

Table 4-51. Okefenokee NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Baker FL	27.2	20%	9.2	30%	$25,426	-1%
Charlton GA	13.4	26%	3.3	4%	$18,523	-7%
Clinch GA	6.8	-2%	3.3	14%	$25,834	16%
Ware GA	36.5	3%	20.8	2%	$26,878	-1%
Area Total	**83.8**	**11%**	**36.7**	**9%**	**$24,985**	**-1%**
Florida	19,057.5	17%	10,008.7	12%	$39,636	5%
Georgia	9,815.2	17%	5,335.9	10%	$35,979	-3%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 4-52 shows the recreation visits for Okefenokee NWR. The Refuge had 458,312 visits in 2010. Non-consumptive recreation accounted for 451,567 visits with residents comprising 36 percent of Refuge visitation.

Visitation data for 2010 is applied because it provides a more accurate representation of visitor use than 2011 data due to major environmental events in 2011. The honey prairie fire impacted refuge visitation significantly in 2011. After the fire, visitation decreased by 40,000 visitors over a three month period (May, June, July). Another factor to consider with the lower number of visitors is the effects of a prolonged drought. In 2011, a La Nina event caused drought in the south and southeastern states. Most of the 120 miles of wilderness canoe trails and associated campsites were closed due to the drought.

Table 4-52. Okefenokee NWR: 2010 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	29,882	55,496	85,378
Auto Tour	36,161	67,155	103,316
Boat Trail/Launch	19,470	36,159	55,629
Bicycle	78	42	120
Interpretation	24,691	45,855	70,546
Photography	12,442	23,107	35,549
Other Recreation	35,325	65,604	100,929
Hunting:			
Big Game	488	54	542
Small Game	108	12	120
Migratory Birds	0	0	0
Fishing:			
Freshwater	4,637	1,546	6,183
Saltwater	0	0	0
Total Visitation	**163,283**	**295,030**	**458,312**

Regional Economic Analysis

The economic area for the Refuge is. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2010 are shown in Table 4-53. Total expenditures were $17.0 million with non-residents accounting for $15.7 million or 92 percent of total expenditures. Expenditures on non-consumptive activities accounted for nearly all of expenditures.

Table 4-54 summarizes the local economic effects associated with recreation visits. Final demand totaled $20.8 million with associated employment of 211 jobs, $6.3 million in employment income and $2.5 million in total tax revenue.

Table 4-53. Okefenokee NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$1,316.2	$15,638.8	$16,955.1
Hunting	$6.4	$2.3	$8.7
Fishing	$34.8	$26.4	$61.2
Total Expenditures	***$1,357.5***	***$15,667.5***	***$17,025.0***

Table 4-54. Okefenokee NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$1,674.70	$19,114.10	$20,788.80
Jobs	17	193	211
Job Income	$511.60	$5,742.85	$6,254.46
Total Tax Revenue	$214.84	$2,316.54	$2,531.38

Table 4-55 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $1.38 means that for every $1 of budget expenditures, $1.38 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 4-55. Okefenokee NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Okefenokee NWR	$18,673.7	$17,025.0	$8,828.4	$1.38

Pea Island National Wildlife Refuge

Description

Pea Island National Wildlife Refuge was established in 1937 "as a refuge and breeding ground for migratory birds and other wildlife", including the greater snow goose and other migratory waterfowl. The Refuge lies on the north end of Hatteras Island, a coastal barrier island which is part of a chain of islands known as the Outer Banks. These islands are separated from the mainland by a series of marshes and shallow sounds up to 25 miles wide. Pea Island is a much-used feeding and resting area for many species of wintering waterfowl, migrating shorebirds, raptors, wading birds, and migrating songbirds. The 13 miles of ocean beach provide nesting habitat for loggerhead sea turtles, piping plover and several species of shorebirds. Peregrine falcons occur regularly during migration and bald eagles are occasionally seen.

The Refuge is comprised of ocean beach, dunes, upland, fresh and brackish water ponds, salt flats, and salt marsh. The official Refuge bird list (Birds of the Outer Banks) boasts nearly 400 species. Other wildlife species include: 25 species of mammals, 24 species of reptiles, and 5 species (low number due to salt environment) of amphibians. Ducks, geese, swans, wading birds, shore birds, raptors, migrating songbirds are seasonally abundant on refuge. The Refuge has approximately 1,000 acres of manageable waterfowl impoundments. Several shorebird nesting areas and wading bird rookeries are located on the Refuge. Endangered and threatened species include: peregrine falcons, American bald eagles, loggerhead sea turtles, and piping plovers.

Pea Island National Wildlife Refuge is located on the Outer Banks in Dare County, 14 miles south of Nags Head, NC.

Area Economy

Table 4-56 shows the area economy for Pea Island NWR. The area population increased by 11 percent from 2001 to 2011, compared with a 18 percent increase for North Carolina and a 9 percent increase for the U.S. as a whole. Area employment increased by 9 percent from 2001 to 2011, with North Carolina showing a 9 percent increase and the U.S. a 6 percent increase. Per capita income in the area and in North Carolina show no change over the 2001-2011 period, while the U.S. increased by 5 percent.

Table 4-56. Pea Island NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Dare NC	34.3	11%	27.6	9%	$38,633	0%
North Carolina	9,656.4	18%	5,262.9	9%	$36,028	0%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 4-57 shows the recreation visits for Pea Island NWR. The Refuge had 603,150 visits in 2011. Non-consumptive recreation accounted for 551,650 visits with residents comprising 40 percent of Refuge visitation. Visitation in 2011 was slightly lower than average due to Hurricane Irene, which resulted in no recreational access to the Refuge for months.

Table 4-57. Pea Island NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	26,000	39,000	65,000
Auto Tour	0	0	0
Boat Trail/Launch	2,385	5,565	7,950
Bicycle	100	100	200
Interpretation	570	1,330	1,900
Photography	70,640	105,960	176,600
Other Recreation	120,000	180,000	300,000
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	300	200	500
Saltwater	20,400	30,600	51,000
Total Visitation	**240,395**	**362,755**	**603,150**

Regional Economic Analysis

The economic area for the Refuge is Dare County in North Carolina. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2011 are shown in Table 4-58. Total expenditures were $16.2 million with non-residents accounting for $14.3 million or 88 percent of total expenditures. Expenditures on non-consumptive activities accounted for 93 percent of all expenditures.

Table 4-59 summarizes the local economic effects associated with recreation visits. Final demand totaled $20.3 million with associated employment of 201 jobs, $6.2 million in employment income and $2.9 million in total tax revenue.

Table 4-58. Pea Island NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$1,405.4	$13,617.4	$15,022.8
Hunting	$0.0	$0.0	$0.0
Fishing	$474.2	$711.3	$1,185.5
Total Expenditures	**$1,879.6**	**$14,328.8**	**$16,208.3**

Table 4-59. Pea Island NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$2,381.1	$17,935.9	$20,317.0
Jobs	25	176	201
Job Income	$768.1	$5,451.0	$6,219.1
Total Tax Revenue	$375.2	$2,552.8	$2,928.0

Table 4-60 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 4-60. Pea Island NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Pea Island NWR	NA	$16,208.3	$9,128.2	$25,336.5

Pocosin Lakes National Wildlife Refuge

Description

Pocosin Lakes National Wildlife was established in 1990 when the Conservation Fund in conjunction with the Richard King Mellon Foundation donated over 93,000 acres to the U.S. Fish & Wildlife Service. The adjacent 12,000 acre Pungo NWR, established in 1963 to serve as a sanctuary for migratory waterfowl, was combined with these new refuge lands and became the Pungo Unit of Pocosin Lakes NWR. Today the Refuge encompasses more than 110,000 acres.

Prior to its establishment, many acres of refuge wetlands were drained through a network of canals and ditches to expand agricultural areas; an alteration that has made the refuge more vulnerable to wildfires.

Pocosin Lakes NWR was established to provide habitat for migratory waterfowl and other birds, to protect and enhance a unique type of wetlands called pocosin, to protect and enhance habitat for those species which are classified as endangered, threatened, or of special concern, and to provide opportunities for wildlife-oriented interpretation, outdoor recreation and environmental education.

Area Economy

Pocosin Lakes NWR is located in northeastern North Carolina. Table 4-61 shows the area economy. The area population decreased by 4 percent from 2001 to 2011, compared with an 18 percent increase for North Carolina and a 9 percent increase for the U.S. as a whole. Area employment showed a 6 percent increase from 2001 to 2011, with North Carolina showing a 9 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 4 percent over the 2001-2011 period, while North Carolina showed no change and the U.S. increased by 5 percent.

Table 4-61. Pocosin Lakes NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Hyde NC	5.8	2%	3.2	4%	$29,572	9%
Washington NC	13.0	-5%	4.8	-2%	$29,830	6%
Tyrrell NC	4.4	-5%	1.9	21%	25,193	-4%
Area Total	**23.2**	**-4%**	**9.9**	**6%**	**$28,198**	**4%**
North Carolina	9,656.4	18%	5,262.9	9%	$36,028	0%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 4-62 shows the recreation visits for Pocosin Lakes NWR. The Refuge had 70,150 visits in 2011. Non-consumptive recreation accounted for 85 percent, followed by hunting (13 percent) and fishing (2 percent). Residents comprised 40 percent of Refuge visitation.

Table 4-62. Pocosin Lakes NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	5,000	5,000	10,000
Auto Tour	5,000	5,000	10,000
Boat Trail/Launch	210	90	300
Bicycle	10	90	100
Interpretation	13,260	22,440	35,700
Photography	1,600	2,400	4,000
Other Recreation	0	0	0
Hunting:			
Big Game	1,600	6,400	8,000
Small Game	300	300	600
Migratory Birds	375	375	750
Fishing:			
Freshwater and Saltwater	490	210	700
Total Visitation	27,845	42,305	70,150

Regional Economic Analysis

The economic area for the Refuge is Hyde, Washington, and Tyrrell Counties in North Carolina. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 4-63. Total expenditures were nearly $2.0 million with non-residents accounting for about $1.8 million or 88 percent of total expenditures. Expenditures on non-consumptive activities accounted for 60 percent of all expenditures.

Table 4-64 summarizes the local economic effects associated with recreation visits. Final demand totaled $2.2 million with associated employment of 25 jobs, $664,300 in employment income and $311,100 in total tax revenue.

Table 4-63. Pocosin Lakes NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	164.4	1,151.4	1,315.8
Hunting	63	600.3	663.2
Fishing	4.9	4.8	9.7
Total Expenditures	232.3	1,756.5	1,988.7

Table 4-64. Pocosin Lakes NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	269.5	1,911.6	2,181.1
Jobs	4	21	25
Job Income	81.5	582.8	664.3
Total Tax Revenue	38.4	272.6	311.1

Table 4-65 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $2.32 means that for every $1 of budget expenditures, $2.32 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 4-65. Pocosin Lakes NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Pocosin Lakes NWR	$1,437.1	$1,988.7	$1,347.7	$2.32

Santee National Wildlife Refuge

Description

Santee NWR was established in 1941, and is in Clarendon County, South Carolina. The Roughly 13,000-acre refuge lies within the Atlantic Coastal Plain and consists of mixed hardwoods, mixed pine hardwoods, pine plantations, marsh, croplands, old fields, ponds, impoundments, and open water. This tremendous diversity of habitats supports many kinds of wildlife.

A myriad of wildlife species inhabit the varied landscape of Santee NWR. During the winter months, the bald eagle and the peregrine falcon can be seen. From November through February, migrating waterfowl, such as pintails, teal, scaup, and wood ducks, along with Canada geese, are a major attraction. Throughout the year, red-tailed and red-shouldered hawks can be viewed soaring overhead, as can a variety of neotropical migratory birds in the trees. The forest also provides a home for white-tailed deer and other woodland creatures, such as raccoons, fox squirrels, wild turkey, gray and red fox, and bobcats. The ponds and marshes provide a home for alligators, plus a number of other reptiles and amphibians. The refuge hosts several state and/or federally listed species including the wood stork and spotted turtle.

The habitat management programs at Santee NWR range from the very basic to complex. One of the basic programs is the wood duck and blue bird nest box program, where nesting boxes are provided in areas that are lacking in available tree cavities. The water and marsh management program is more complex. Water levels are adjusted to provide maximum benefits for wildlife. In the impoundments and marshes different water levels are used to stimulate certain vegetation to grow while controlling invasive and unwanted species. Periodically flooding bottomland hardwoods, which contain mast-producing wildlife foods, are very beneficial to waterfowl.

The management of forest and croplands is also critical. Refuge staff and contracted private farmers plant corn, wheat, millet, nutgrass, or other small grain crops. These crops attract many species of wildlife and provide an excellent source of high-energy foods for wintering waterfowl. Refuge forests are maintained with management techniques, ranging from prescribed burning to selective thinning.

The refuge boundary and acreage has changed significantly since its inception, from an approximate 90,000 acres in the 1940's to the approximately 13,000 acres today. The current visitation numbers also reflect that change. When the new lease agreement with SC Public Service Authority was imposed (1975) decreasing the refuge acreage by 64,000 acres, the refuge visitation dropped from over 1 million visits to 173,000 visits by 1977 and 166,000 visits in 1978.

Area Economy

Table 4-66 shows the area economy for Santee NWR. The area population increased by 2 percent from 2001 to 2011, compared with a 15 percent increase for South Carolina and a 9 percent increase for the U.S. as a whole. Area employment decreased by 1 percent from 2001 to 2011, with South Carolina showing an 11 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 8 percent over the 2001-2011 period, while South Carolina and the U.S. increased by 3 and 5 percent respectively.

Table 4-66. Santee NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Clarendon SC	34.7	6%	11.9	7%	$24,431	0%
Orangeburg SC	91.9	0%	42.2	-3%	$28,965	7%
Sumter SC	107.5	3%	53.4	-1%	$29,915	11%
Area Total	**234.1**	**2%**	**107.5**	**-1%**	**$28,729**	**8%**
South Carolina	4,679.2	15%	2,481.7	11%	$33,388	3%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 4-67 shows the recreation visits for Santee NWR. The Refuge had 174,178 visits in 2011. Non-consumptive recreation accounted for 112,027 visits with residents comprising 51 percent of Refuge visitation.

Table 4-67. Santee NWR: 2011 Recreation Visits

Activity		Residents	Non-Residents	Total
Non-Consumptive:				
	Pedestrian	10,045	15,067	25,112
	Auto Tour	33,810	50,715	84,525
	Boat Trail/Launch	270	30	300
	Bicycle	125	125	250
	Interpretation	85	255	340
	Photography	30	270	300
	Other Recreation	720	480	1,200
Hunting:				
	Big Game	1,436	615	2,051
	Small Game	100	0	100
	Migratory Birds	0	0	0
Fishing:				
	Freshwater	42,000	18,000	60,000
	Saltwater	0	0	0
Total Visitation		**88,621**	**85,558**	**174,178**

Regional Economic Analysis

The economic area for the Refuge is Clarendon, Orangeburg, and Sumter Counties in South Carolina. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 4-68. Total expenditures were $4.5 million with non-residents accounting for $3.7 million or 82 percent of total expenditures. Expenditures on non-consumptive activities accounted for 80 percent of all expenditures.

Table 4-69 summarizes the local economic effects associated with recreation visits. Final demand totaled $5.6 million with associated employment of 56 jobs, $1.6 million in employment income and $641,600 in total tax revenue.

Table 4-68. Santee NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$339.7	$3,252.2	$3,592.0
Hunting	$39.4	$52.3	$91.8
Fishing	$420.2	$409.9	$830.1
Total Expenditures	**$799.3**	**$3,714.5**	**$4,513.8**

Table 4-69. Santee NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$994.9	$4,600.0	$5,594.9
Jobs	11	45	56
Job Income	$286.4	$1,300.0	$1,586.4
Total Tax Revenue	$123.7	$517.9	$641.6

Table 4-70 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $14.54 means that for every $1 of budget expenditures, $14.54 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 4-70. Santee NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Santee NWR	$569.4	$4,513.8	$3,767.4	$14.54

St. Marks National Wildlife Refuge

Description

St. Marks National Wildlife Refuge is located along the Gulf Coast of Florida's "Big Bend." Covering a vast 70,000 acres across three counties, the refuge is known for its migratory bird populations, lush wetlands and forested habitats, and its abundance of migrating monarch butterflies. The refuge was established in 1931 as protective wintering habitat for migratory birds and is one of the oldest refuges in the system.

St. Marks attracts over 257,000 visitors each year to view wildlife and wild landscapes, the historic St. Marks Lighthouse, vast numbers of migrating monarch butterflies in the fall, alligators, and even black bears and bobcats. St. Marks NWR offers a diversity of recreational opportunities ranging from wildlife photography, hiking, environmental education, freshwater and saltwater fishing, hunting, boating and wildlife observation. There are over 85 miles of marked hiking trails and the refuge includes a segment of the Florida National Scenic Trail, a segment of the Florida Saltwater Circumnavigational Paddling Trail, and a segment of the Big Bend Scenic Byway. The refuge attracts many generations of visitors to learn more about the natural resources of the area and to enjoy the serenity and beauty of this amazing refuge.

Area Economy

St. Marks NWR is located in northwestern Florida. Table 4-71 shows the area economy. The area population increased by 16 percent from 2001 to 2011, compared with a 17 percent increase for Florida and a 9 percent increase for the U.S. as a whole. Area employment increased by 5 percent from 2001 to 2011, with Florida showing a 12 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 5 percent over the 2001-2011 period, while Florida and the U.S. also both increased by 5 percent.

Table 4-71. St. Marks NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Leon FL	278.0	15%	180.9	4%	$36,823	4%
Wakulla FL	31.0	30%	8.7	29%	$29,157	-2%
Area Total	**308.9**	**16%**	**189.6**	**5%**	**$36,054**	**3%**
Florida	19,057.5	17%	10,008.7	12%	$39,636	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 4-72 shows the recreation visits for St. Marks NWR. The Refuge had 411,936 visits in 2011. Non-consumptive recreation accounted for 341,945 visits with residents comprising 78 percent of Refuge

visitation. Visitation in 2011 was slightly lower than 2007 but was an improvement over 2010 visitation. Recreational visitation has been impacted by the recession and oil spill threat.

Table 4-72. St. Marks NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	19,313	6,438	25,750
Auto Tour	154,500	51,500	206,000
Boat Trail/Launch	773	258	1,030
Bicycle	1,545	515	2,060
Interpretation	9,144	3,048	12,192
Photography	57,825	19,275	77,100
Other Recreation	13,360	4,453	17,813
Hunting:			
Big Game	1,745	194	1,939
Small Game	45	5	50
Migratory Birds	120	30	150
Fishing:			
Freshwater	4,817	535	5,352
Saltwater	60,000	2,500	62,500
Total Visitation	**323,186**	**88,750**	**411,936**

Regional Economic Analysis

The economic area for the Refuge is Leon and Wakulla Counties in Florida. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 4-73. Total expenditures were $11.9 million with non-residents accounting for $6.1 million or 52 percent of total expenditures. Expenditures on non-consumptive activities accounted for 74 percent of all expenditures, followed by fishing (25 percent) and hunting (less than 1 percent).

Table 4-74 summarizes the local economic effects associated with recreation visits. Final demand totaled $17.2 million with associated employment of 157 jobs, $5.1 million in employment income and $2.1 million in total tax revenue.

Table 4-73. St. Marks NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$2,810.4	$5,994.6	$8,805.0
Hunting	$50.1	$18.9	$69.0
Fishing	$2,844.0	$133.8	$2,977.8
Total Expenditures	**$5,704.5**	**$6,147.3**	**$11,851.8**

Table 4-74. St. Marks NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$8,555.4	$8,682.5	$17,237.9
Jobs	81	76	157
Job Income	$2,518.4	$2,589.3	$5,107.7
Total Tax Revenue	$1,087.1	$1,061.5	$2,148.6

Table 4-75 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $10.62 means that for every $1 of budget expenditures, $10.62 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 4-75. St. Marks NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
St. Marks NWR	$2,197.0	$11,851.8	$11,480.4	$10.62

Waccamaw National Wildlife Refuge

Description

Waccamaw National Wildlife Refuge was established on December 1, 1997. The purposes for which Waccamaw NWR was established are (1) protect and manage diverse habitat components within an important coastal river ecosystem for the benefit of endangered and threatened species, freshwater and anadromous fish, migratory birds, and forest wildlife, including a wide array of plants and animals associated with bottomland hardwood habitats; and (2) provide compatible wildlife-dependent recreational activities including hunting, fishing, wildlife observation, photography, and environmental education and interpretation for the of present and future generations.

Located in portions of Horry, Georgetown, and Marion County, Waccamaw NWR's acquisition boundary spans over 55,000 acres and includes large sections of the Waccamaw and Great Pee Dee Rivers and a small section of the Little Pee Dee River. The US Fish and Wildlife Service is actively acquiring lands within this acquisition boundary from willing sellers and presently Refuge lands total nearly 26,000 acres.

Waccamaw NWR is one of four refuges in the South Carolina Lowcountry Refuges Complex. The others include Ace Basin NWR, Cape Romain NWR, & Santee NWR.

Area Economy

Waccamaw NWR is located in eastern South Carolina. Table 4-76 shows the area economy. The area population increased by 26 percent from 2001 to 2011, compared with a 15 percent increase for South Carolina, and a 9 percent increase for the U.S. as a whole. Area employment increased by 16 percent from 2001 to 2011, with South Carolina showing an 11 percent increase respectively, and the U.S. a 6 percent increase. Area per capita income decreased by 3 percent over the 2001-2011 period, while South Carolina and the U.S. increased by 3 and 5 percent respectively.

Table 4-76. Waccamaw NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Georgetown SC	60.0	6%	36.4	19%	$38,403	14%
Horry SC	276.3	37%	143.4	18%	$29,148	-9%
Marion SC	32.8	-6%	14.7	-4%	$26,397	7%
Area Total	**369.2**	**26%**	**194.6**	**16%**	**$30,407**	**-3%**
South Carolina	4,679.2	15%	2,481.7	11%	$33,388	3%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 4-77 shows the recreation visits for Waccamaw NWR. The Refuge had 7,691 visits in 2011. Non-consumptive recreation accounted for 6,260 visits with residents comprising 77 percent of Refuge visitation. The number of visitors has increased every year since the Refuge's establishment in 1997. This growth can be attributed to the Refuge increasing public awareness, activities, and operating hours.

Table 4-77. Waccamaw NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	926	309	1,235
Auto Tour	0	0	0
Boat Trail/Launch	152	8	160
Bicycle	295	16	310
Interpretation	1,095	730	1,825
Photography	84	21	105
Other Recreation	2,100	525	2,625
Hunting:			
Big Game	419	47	465
Small Game	81	4	85
Migratory Birds	67	4	71
Fishing:			
Freshwater	711	79	790
Saltwater	10	10	20
Total Visitation	**5,939**	**1,752**	**7,691**

Regional Economic Analysis

The economic area for the Refuge is Georgetown, Horry, and Marion Counties in South Carolina. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 4-78. Total expenditures were $169,400 with non-residents accounting for $99,500 or 59 percent of total expenditures. Expenditures on non-consumptive activities accounted for 83 percent of all expenditures.

Table 4-79 summarizes the local economic effects associated with recreation visits. Final demand totaled $225,900 with associated employment of 4 jobs, $82,400 in employment income and $27,800 in total tax revenue.

Table 4-78. Waccamaw NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$47.9	$93.0	$140.9
Hunting	$10.9	$3.3	$14.3
Fishing	$11.1	$3.2	$14.3
Total Expenditures	**$69.9**	**$99.5**	**$169.4**

Table 4-79. Waccamaw NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$94.7	$131.2	$225.9
Jobs	2	2	4
Job Income	$39.1	$43.3	$82.4
Total Tax Revenue	$12.2	$15.6	$27.8

Table 4-80 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $1.02 means that for every $1 of budget expenditures, $1.02 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 4-80. Waccamaw NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Waccamaw NWR	$362.6	$169.4	$200.4	$1.02

Region 5

Region 5 for the U.S. Fish & Wildlife Service includes Connecticut, District of Columbia, Delaware, Massachusetts, Maryland, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Virginia, and Vermont. Sample refuges selected within this region include:

Assabet River NWR (Massachusetts)
Back Bay NWR (Virginia)
Blackwater NWR (Maryland)
Canaan Valley NWR (West Virginia)
Eastern Neck NWR (Maryland)
Eastern Shore of Virginia NWR (Virginia)
Edwin B. Forsythe NWR (New Jersey)
Great Dismal Swamp (North Carolina and Virgina)
Great Swamp NWR (New Jersey)
John Heinz at Tinicum NWR (Pennsylvania)
Maine Coastal Islands NWR (Maine)
Moosehorn NWR (Maine)
Occoquan NWR (Virginia)
Stewart B. McKinney NWR (Connecticut)

Assabet River National Wildlife Refuge

Description

The Assabet River National Wildlife Refuge has a large wetland complex, several smaller wetlands and vernal pools, and large forested areas which are important feeding and breeding areas for migratory birds and other wildlife. It also has 15 miles of trails open to the public for the enjoyment of nature as well as a visitor center located on Winterberry Way.

The refuge is located approximately 20 miles west of Boston in portions of the towns of Hudson, Maynard, Stow and Sudbury. It consists of several separate pieces of land: a 1,900-acre northern section, a 300-acre southern section, and 113 acres scattered along the Assabet River in Stow. The main entrance to the refuge is at 680 Hudson Road in Sudbury. The refuge is one of eight national wildlife refuges that comprise the Eastern Massachusetts National Wildlife Refuge Complex. These eight ecologically diverse refuges include Assabet River, Great Meadows, Mashpee, Massasoit, Monomoy, Nantucket, Nomans Land Island and Oxbow.

Area Economy

Assabet River NWR is located in eastern Massachusetts. Table 5-1 shows the area economy. The area population increased by 3 percent from 2001 to 2011, compared with a 3 percent increase for Massachusetts and a 9 percent increase for the U.S. as a whole. Area employment increased by 1 percent from 2001 to 2011, with Massachusetts showing a 2 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 5 percent over the 2001-2011 period, while Massachusetts and the U.S. increased by 6 and 5 percent respectively.

Table 5-1. Assabet River NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Middlesex MA	1,518.2	3%	1,079.5	1%	$62,324	3%
Suffolk MA	730.9	4%	702.5	1%	$55,472	8%
Area Total	**2,249.1**	**3%**	**1,782.0**	**1%**	**$60,097**	**5%**
Massachusetts	6,587.5	3%	4,168.9	2%	$53,471	6%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 5-2 shows the recreation visits for Assabet River NWR. The Refuge had 119,130 visits in 2011. Non-consumptive recreation accounted for 116,719 visits with residents comprising 84 percent of Refuge visitation. Visitation has increased significantly since the new visitor center opened in October 2010.

Table 5-2. Assabet River NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	52,000	13,000	65,000
Auto Tour	0	0	0
Boat Trail/Launch	143	8	150
Bicycle	13,500	1,500	15,000
Interpretation	1,355	14	1,369
Photography	27,000	3,000	30,000
Other Recreation	4,680	520	5,200
Hunting:			
Big Game	1,199	133	1,332
Small Game	67	7	74
Migratory Birds	5	1	5
Fishing:			
Freshwater	900	100	1,000
Saltwater	0	0	0
Total Visitation	**100,848**	**18,282**	**119,130**

Regional Economic Analysis

The economic area for the Refuge is Middlesex and Suffolk Counties in Massachusetts. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 5-3. Total expenditures were nearly $1.2 million with non-residents accounting for $627,200 or 53 percent of total expenditures. Expenditures on non-consumptive activities accounted for 97 percent of all expenditures.

Table 5-4 summarizes the local economic effects associated with recreation visits. Final demand totaled $2.1 million with associated employment of 12 jobs, $688,600 in employment income and $302,500 in total tax revenue.

Table 5-3. Assabet River NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$536.6	$618.7	$1,155.4
Hunting	$20.4	$5.7	$26.1
Fishing	$7.5	$2.8	$10.3
Total Expenditures	**$564.5**	**$627.2**	**$1,191.8**

Table 5-4. Assabet River NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$988.6	$1,089.8	$2,078.4
Jobs	6	6	12
Job Income	$329.6	$359.0	$688.6
Total Tax Revenue	$148.2	$154.3	$302.5

Table 5-5 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 5-5. Assabet River NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Assabet River NWR	NA	$1,191.8	$1,943.7	$3,135.5

Back Bay National Wildlife Refuge

Description

Back Bay National Wildlife Refuge is located in southeastern Virginia and was established in 1938 to provide habitat for migrating and wintering waterfowl. The Refuge contains approximately 9,200 acres, situated around Back Bay, in the southeastern corner of the City of Virginia Beach. Because of its unique geographic location along the Atlantic Coast that provides overlapping ranges for both northern and southern species, biodiversity is high. Habitats include barrier island beach and dunes, shrub-scrub, woodlands, farm land and fresh and brackish marsh. Since 1939, an additional 4,600 acres of Bay waters within the refuge boundary have been closed to migratory bird hunting by Presidential Proclamation.

Today the Refuge continues to be an important link in the chain of National Wildlife Refuges along the Atlantic Flyway. More than 350 species of birds have been observed at the Refuge. During the fall and winter months, large flocks of waterfowl use the Bay and freshwater impoundments. The Snow and Canada goose, Tundra swan, and many duck species are abundant. Migrating songbirds and shorebirds arrive at the Refuge each spring and fall. Brightly colored warblers dot shrub and woodland areas while shorebirds search for food in shallow waters. Habitats are also used by a wide assortment of other wildlife, including such threatened, endangered, and specially protected species as the Loggerhead sea turtle, Piping plover, Peregrine falcon, and Bald eagle.

Area Economy

Table 5-6 shows the area economy for Back Bay NWR. The area population increased by 3 percent from 2001 to 2011, compared with a 12 percent increase for Virginia and a 9 percent increase for the U.S. as a whole. Area employment increased by 4 percent from 2001 to 2011, with Virginia showing a 9 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 16 percent over the 2001-2011 period, while Virginia and the U.S. increased by 9 and 5 percent respectively.

Table 5-6. Back Bay NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Virginia Beach (Independent City) VA	442.7	3%	238.6	4%	$46,799	16%
Virginia	8,096.6	12%	4,800.8	9%	$46,107	9%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 5-7 shows the recreation visits for Back Bay NWR. The Refuge had 123,660 visits in 2011. Non-consumptive recreation accounted for 97,465 visits with residents comprising 87 percent of Refuge visitation. Visitation has declined compared to previous years due to weather, the economy, and the price

of fuel. As part of a coastal tourist community, it is not unusual for Refuge visitation to vary as much as 20 percent from year to year.

Table 5-7. Back Bay NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	25,330	4,470	29,800
Auto Tour	1,980	220	2,200
Boat Trail/Launch	11,970	1,330	13,300
Bicycle	16,575	2,925	19,500
Interpretation	1,620	180	1,800
Photography	1,296	144	1,440
Other Recreation	25,011	4,414	29,425
Hunting:			
Big Game	176	20	195
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	13,275	1,475	14,750
Saltwater	10,125	1,125	11,250
Total Visitation	**107,358**	**16,302**	**123,660**

Regional Economic Analysis

The economic area for the Refuge is Virginia Beach, Virginia. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 5-8. Total expenditures were $1.9 million with non-residents accounting for $759,400 or 40 percent of total expenditures. Expenditures on non-consumptive activities accounted for 71 percent of all expenditures.

Table 5-9 summarizes the local economic effects associated with recreation visits. Final demand totaled $3.1 million with associated employment of 27 jobs, $913,900 in employment income and $427,800 in total tax revenue.

Table 5-8. Back Bay NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$695.1	$645.2	$1,340.3
Hunting	$3.8	$1.0	$4.8
Fishing	$418.0	$113.2	$531.2
Total Expenditures	**$1,116.9**	**$759.4**	**$1,876.3**

Table 5-9. Back Bay NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$1,847.4	$1,226.0	$3,073.4
Jobs	17	10	27
Job Income	$553.2	$360.7	$913.9
Total Tax Revenue	$264.3	$163.5	$427.8

Table 5-10 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $3.02 means that for every $1 of budget expenditures, $3.02 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 5-10. Back Bay NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Back Bay NWR	$1,650.1	$1,876.3	$3,112.8	$3.02

Blackwater National Wildlife Refuge

Description

Blackwater National Wildlife Refuge, part of the Chesapeake Marshlands NWR Complex (Blackwater, Martin, Susquehanna and Eastern Neck NWR's) located 12 miles south of Cambridge, Maryland, was established in 1933 as a refuge for migratory birds. The refuge includes more than 28,000 acres of rich tidal marsh, mixed hardwood and loblolly pine forest, managed freshwater impoundments and croplands. It serves as an important resting and feeding area for migrating and wintering waterfowl, and supports one of the highest concentrations of nesting bald eagles on the Atlantic coast. Blackwater NWR is also home to the largest endemic populations of endangered Delmarva Peninsula fox squirrels.

Area Economy

Blackwater NWR is located in the eastern shore in Maryland. Table 5-11 shows the area economy. The area population increased by 7 percent from 2001 to 2011, compared with a 8 percent increase for Maryland and a 9 percent increase for the U.S. as a whole. Area employment showed no change from 2001 to 2011, with Maryland showing a 9 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 8 percent over the 2001-2011 period, while Maryland and the U.S. increased by 10 and 5 percent respectively.

Table 5-11. Blackwater NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Dorchester MD	32.6	7%	16.2	0%	$34,771	8%
Maryland	5,828.3	8%	3,395.7	9%	$50,656	10%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 5-12 shows the recreation visits for Blackwater NWR. The Refuge had 82,163 visits in 2011. Non-consumptive recreation accounted for 71,416 visits with residents comprising 20 percent of Refuge visitation. Visitation in 2011 was slightly lower than average due to the closure of the main visitor center for renovation in November 2010 and the closure of the auto tour route for maintenance in September and October 2011.

Table 5-12. Blackwater NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	25	475	500
Auto Tour	4,188	37,688	41,876
Boat Trail/Launch	200	1,800	2,000
Bicycle	52	988	1,040
Interpretation	1,500	3,500	5,000
Photography	2,100	18,900	21,000
Other Recreation	0	0	0
Hunting:			
Big Game	344	1,031	1,375
Small Game	52	96	148
Migratory Birds	25	99	124
Fishing:			
Freshwater	95	5	100
Saltwater	8,100	900	9,000
Total Visitation	**16,680**	**65,483**	**82,163**

Regional Economic Analysis

The economic area for the Refuge is Dorchester County in Maryland. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2011 are shown in Table 5-13. Total expenditures were $2.3 million with non-residents accounting for $2.0 million or 88 percent of total expenditures. Expenditures on non-consumptive activities accounted for 86 percent of all expenditures.

Table 5-14 summarizes the local economic effects associated with recreation visits. Final demand totaled $2.5 million with associated employment of 23 jobs, $765,700 in employment income and $351,200 in total tax revenue.

Table 5-13. Blackwater NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$40.7	$1,927.9	$1,968.6
Hunting	$8.1	$57.7	$65.8
Fishing	$217.6	$46.5	$264.1
Total Expenditures	**$266.4**	**$2,032.1**	**$2,298.5**

Table 5-14. Blackwater NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$258.8	$2,221.4	$2,480.1
Jobs	3	20	23
Job Income	$81.3	$684.4	$765.7
Total Tax Revenue	$48.1	$303.1	$351.2

Table 5-15 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 5-15. Blackwater NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Blackwater NWR	NA	$2,298.5	$1,401.7	$3,700.3

Canaan Valley National Wildlife Refuge

Description

Canaan Valley NWR is located in Tucker County, West Virginia. The refuge was established in 1994 to preserve the unique wetlands and uplands of this high elevation, moist valley. Currently, the refuge consists of 16,550 acres.

Canaan Valley, at an altitude of 3,200 feet, is 14 miles long and 3 miles wide, and the highest valley of its size east of the Rocky Mountains. Climate and habitats are typical of areas much further north, and the plants and animals are unusual for the latitude. Many Valley species are at or near the southernmost edge of their ranges. Drained by the Blackwater River and its tributaries, Canaan Valley contains the largest freshwater wetland area in West Virginia and the central and southern Appalachians.

Area Economy

Canaan NWR is located in the Potomac Highlands region of West Virginia. Table 5-16 shows the area economy. The area population increased by 11 percent from 2001 to 2011, compared with a 3 percent increase for West Virginia and a 9 percent increase for the U.S. as a whole. Area employment increased by 18 percent from 2001 to 2011, with West Virginia showing a 5 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 15 percent over the 2001-2011 period, while West Virginia and the U.S. increased by 12 and 5 percent respectively.

Table 5-16. Canaan Valley NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Marion WV	56.6	1%	28.0	5%	$36,338	15%
Monongalia WV	98.5	18%	67.1	27%	$37,632	14%
Tucker WV	7.0	-3%	3.6	-8%	$28,837	10%
Area Total	**162.1**	**11%**	**98.7**	**18%**	**$36,800**	**15%**
West Virginia	1,855.4	3%	918.7	5%	$33,403	12%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 5-17 shows the recreation visits for NWR. The Refuge had 44,795 visits in 2011. Non-consumptive recreation accounted for 39,303 visits with residents comprising 42 percent of Refuge visitation.

Table 5-17. Canaan Valley NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	7,895	18,421	26,316
Auto Tour	0	0	0
Boat Trail/Launch	132	33	165
Bicycle	2,107	527	2,634
Interpretation	622	155	777
Photography	494	1,152	1,645
Other Recreation	3,883	3,883	7,766
Hunting:			
Big Game	2,807	1,721	4,528
Small Game	242	148	390
Migratory Birds	232	142	374
Fishing:			
Freshwater	180	20	200
Saltwater	0	0	0
Total Visitation	**18,593**	**26,202**	**44,795**

Regional Economic Analysis

The economic area for the Refuge is Marion, Monongalia, and Tucker Counties in West Virginia. It is assumed that visitor expenditures occur primarily within these three counties. Visitor recreation expenditures for 2011 are shown in Table 5-18. Total expenditures were $711,200 with non-residents accounting for $616,500 or 87 percent of total expenditures. Expenditures on non-consumptive activities accounted for 85 percent of all expenditures.

Table 5-19 summarizes the local economic effects associated with recreation visits. Final demand totaled $952,000 with associated employment of 9 jobs, $284,200 in employment income and $122,100 in total tax revenue.

Table 5-18. Canaan Valley NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$50.8	$551.7	$602.5
Hunting	$42.3	$64.3	$106.6
Fishing	$1.5	$0.6	$2.1
Total Expenditures	**$94.6**	**$616.5**	**$711.2**

Table 5-19. Canaan Valley NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$129.8	$822.3	$952.0
Jobs	1	8	9
Job Income	$39.2	$245.0	$284.2
Total Tax Revenue	$18.0	$104.1	$122.1

Table 5-20 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $1.77 means that for every $1 of budget expenditures, $1.77 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 5-20. Canaan Valley NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Canaan Valley NWR	$737.8	$711.2	$595.7	$1.77

Eastern Neck National Wildlife Refuge

Description

Eastern Neck National Wildlife Refuge, a part of the Chesapeake Marshlands National Wildlife Refuge Complex, is a 2,286-acre island located at the confluence of the Chester River and the Chesapeake Bay. Established in 1962 as a sanctuary for migratory birds, Eastern Neck NWR provides natural habitat for over 240 bird species. More than 100,000 ducks, geese and tundra swans utilize the refuge each year, as do migrating and breeding songbirds and shorebirds. Bald eagles thrive here year-round.

Eastern Neck NWR serves as a land-use model within the Chesapeake Bay watershed through its sustainable agriculture, wetland restoration and native landscaping.

An easy day-trip from the metropolitan areas of Baltimore, Philadelphia, and the nation's capital, Eastern Neck NWR provides a variety of recreational opportunities for all ages. Nearly nine miles of trails and roads, including universally-accessible boardwalks and a waterside trail, are open to visitors most of the year, providing excellent wildlife viewing and spectacular Chesapeake Bay vistas. The refuge is home to the amazing Bayscape Butterfly Garden, where visitors may observe and photograph butterflies, birds and other wildlife during the warm season. Facilities for boating, fishing, and crabbing are also available.

Area Economy

Eastern Neck NWR is located on the eastern shore in Maryland. Table 5-21 shows the area economy. The area population increased by 13 percent from 2001 to 2011, compared with a 8 percent increase for Maryland and a 9 percent increase for the U.S. as a whole. Area employment increased by 17 percent from 2001 to 2011, with Maryland showing a 9 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 9 percent over the 2001-2011 period, while Maryland and the U.S. increased by 10 and 5 percent respectively.

Table 5-21. Eastern Neck NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Kent MD	20.2	5%	12.5	7%	$44,489	7%
Queen Anne's MD	48.4	17%	22.1	23%	$49,605	9%
Area Total	**68.6**	**13%**	**34.6**	**17%**	**$48,097**	**9%**
Maryland	5,828.3	8%	3,395.7	9%	$50,656	10%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 5-22 shows the recreation visits for Eastern Neck NWR. The Refuge had 92,150 visits in 2011. Non-consumptive recreation accounted for 82,578 visits with residents comprising 78 percent of Refuge visitation.

Table 5-22. Eastern Neck NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	25,803	2,867	28,670
Auto Tour	35,910	15,390	51,300
Boat Trail/Launch	829	92	921
Bicycle	91	23	114
Interpretation	151	17	168
Photography	952	238	1,190
Other Recreation	194	22	215
Hunting:			
Big Game	61	15	76
Small Game	6	0	6
Migratory Birds	0	0	0
Fishing:			
Freshwater	82	2	84
Saltwater	7,995	1,411	9,406
Total Visitation	**72,074**	**20,076**	**92,150**

Regional Economic Analysis

The economic area for the Refuge is Kent and Queen Anne's Counties in Maryland. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 5-23. Total expenditures were $693,600 with non-residents accounting for $333,100 or 48 percent of total expenditures. Expenditures on non-consumptive activities accounted for 69 percent of all expenditures.

Table 5-23 summarizes the local economic effects associated with recreation visits. Final demand totaled $929,900 with associated employment of 9 jobs, $287,100 in employment income and $139,000 in total tax revenue.

Table 5-23. Eastern Neck NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$197.6	$277.7	$475.3
Hunting	$1.5	$0.8	$2.3
Fishing	$161.4	$54.6	$216.0
Total Expenditures	**$360.5**	**$333.1**	**$693.6**

Table 5-24. Eastern Neck NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$475.8	$454.2	$929.9
Jobs	5	4	9
Job Income	$150.6	$136.5	$287.1
Total Tax Revenue	$75.2	$63.8	$139.0

Table 5-25 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $5.69 means that for every $1 of budget expenditures, $5.69 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio. This ratio does not account for other local economic effects besides recreation, such as the cooperative agriculture program.

Table 5-25. Eastern Neck NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Eastern Neck NWR	$282.6	$693.6	$913.5	$5.69

Eastern Shore of Virginia National Wildlife Refuge

Description

Lying at the tip of the Delmarva Peninsula, the Eastern Shore of Virginia National Wildlife Refuge serves as one of the country's most valuable stopovers for migratory birds. Nestled between the Atlantic Ocean and Chesapeake Bay, this 1,127-acre refuge was established in 1984 for migratory birds and endangered species management and for wildlife-dependent recreation including interpretation and education.

This area is one of the most important avian migration funnels in North America. Each fall, like colorful clockwork, the refuge is the scene of a spectacular drama as millions of songbirds and monarch butterflies and thousands of raptors converge at the tip of the peninsula on their voyage south.

Area Economy

Eastern Shore NWR is located on the eastern coast in the coastal plain area of Virginia. Table 5-26 shows the area economy. The area population increased by -4 percent from 2001 to 2011, compared with a 12 percent increase for Virginia and a 9 percent increase for the U.S. as a whole. Area employment increased by 1 percent from 2001 to 2011, with Virginia showing a 9 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 18 percent over the 2001-2011 period, while Virginia and the U.S. increased by 9 and 5 percent respectively.

Table 5-26. Eastern Shore of Virginia NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Northampton VA	12.4	-4%	6.9	1%	$36,011	18%
Virginia	8,096.6	12%	4,800.8	9%	$46,107	9%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 5-27 shows the recreation visits for Eastern Shore of Virginia NWR. The Refuge had 36,625 visits in 2011. Non-consumptive recreation accounted for 28,705 visits with residents comprising 25 percent of Refuge visitation.

Table 5-27. Eastern Shore of Virginia NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	167	3,164	3,330
Auto Tour	333	6,327	6,660
Boat Trail/Launch	475	9,025	9,500
Bicycle	8	157	165
Interpretation	94	1,788	1,882
Photography	36	688	724
Other Recreation	322	6,122	6,444
Hunting:			
Big Game	6	314	320
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	0	0	0
Saltwater	7,600	0	7,600
Total Visitation	**9,042**	**27,583**	**36,625**

Regional Economic Analysis

The economic area for the Refuge is Northampton County in Virginia. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2011 are shown in Table 5-28. Total expenditures were $1.2 million with non-residents accounting for $815,400 or 66 percent of total expenditures. Expenditures on non-consumptive activities accounted for 66 percent of all expenditures.

Table 5-29 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.6 million with associated employment of 14 jobs, $523,000 in employment income and $183,700 in total tax revenue.

Table 5-28. Eastern Shore of Virginia NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$7.2	$798.6	$805.8
Hunting	$0.1	$16.8	$16.9
Fishing	$407.4	$0.0	$407.4
Total Expenditures	**$414.7**	**$815.4**	**$1,230.1**

Table 5-29. Eastern Shore of Virginia NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$499.6	$1,096.3	$1,595.9
Jobs	5	9	14
Job Income	$169.6	$353.4	$523.0
Total Tax Revenue	$64.6	$119.1	$183.7

Table 5-30 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $3.78 means that for every $1 of budget expenditures, $3.78 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 5-30. Eastern Shore of Virginia NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Eastern Shore of Virginia NWR	$552.5	$1,230.1	$856.0	$3.78

Edwin B. Forsythe National Wildlife Refuge

Description

Edwin B. Forsythe NWR, extending almost 50 miles northward from Atlantic City in coastal New Jersey, was once two distinct refuges: Brigantine NWR and Barnegat NWR, established in 1939 and 1967, respectively, to provide important wintering habitat for waterfowl, especially American black ducks and Atlantic brant. The refuges were combined in 1984 as Edwin B. Forsythe, in honor of the late conservationist Congressman from New Jersey. The refuge is comprised of approximately 47,000 acres in three counties including Atlantic, Burlington, and Ocean.

Nearly 80 percent of Edwin B. Forsythe Refuge is tidal salt meadow and marsh, interspersed with shallow coves and bays, which is very important for wintering waterfowl and migratory shorebirds. Most of the remainder of the refuge is woodlands dominated by pitch pines, oaks, and some Atlantic white-cedar. More than 6,000 acres of habitat are designated as the Brigantine Wilderness Area. This includes Holgate and Little Beach Island, two of the few remaining undeveloped barrier beaches in New Jersey. These pristine sites provide critical nesting habitat for federally listed threatened piping plovers and a wide variety of other beach-nesting species, including black skimmers and least terns. Occasionally peregrine falcons, bald eagles and osprey are seen.

Each spring and fall, thousands of water birds stop at Edwin B. Forsythe Refuge during their long migrations. Waterfowl, wading birds, and shorebirds may be viewed from the Wildlife Drive as they feed and rest. Refuge uplands also provide important stopover habitat for migrating passerines.

Edwin B. Forsythe Refuge is a Western Hemisphere Shorebird Reserve Network site, a Wetlands of International Importance under the Ramsar Convention, and an important area for wildlife photography and bird-watching. It also is a part of The Jacques Cousteau National Estuarine Research Reserve and The New Jersey Coastal Heritage Trail.

Area Economy

Edwin B. Forsythe NWR is located in southeastern New Jersey on the coast. Table 5-31 shows the area economy. The area population increased by 8 percent from 2001 to 2011, compared with a 4 percent increase for New Jersey and a 9 percent increase for the U.S. as a whole. Area employment increased by 10 percent from 2001 to 2011, with New Jersey showing a 5 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 1 percent over the 2001-2011 period, while New Jersey and the U.S. increased by 4 and 5 percent respectively.

Table 5-31. Edwin B. Forsythe NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent	2011	Percent	2011	Percent
Atlantic NJ	274.3	7%	174.2	1%	$40,262	-2%
Burlington NJ	449.6	5%	263.0	9%	$48,318	3%
Ocean NJ	579.4	11%	223.5	19%	$40,724	0%
Area Total	**1,303.3**	**8%**	**660.7**	**10%**	**$43,246**	**1%**
New Jersey	8,821.2	4%	4,984.0	5%	$52,430	4%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 5-32 shows the recreation visits for Edwin B. Forsythe NWR. The Refuge had 223,924 visits in 2011. Non-consumptive recreation accounted for 104.424 visits with residents comprising 68 percent of Refuge visitation.

Table 5-32. Edwin B. Forsythe NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	41,250	13,750	55,000
Auto Tour	55,800	37,200	93,000
Boat Trail/Launch	2,100	900	3,000
Bicycle	75	25	100
Interpretation	1,994	1,330	3,324
Photography	28,000	12,000	40,000
Other Recreation	0	0	0
Hunting:			
Big Game	1,260	140	1,400
Small Game	0	0	0
Migratory Birds	880	220	1,100
Fishing:			
Freshwater	225	25	250
Saltwater	20,063	6,688	26,750
Total Visitation	**151,647**	**72,277**	**223,924**

Regional Economic Analysis

The economic area for the Refuge is Atlantic, Burlington, and Ocean Counties in New Jersey. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 5-33. Total expenditures were about $4.1 million with non-residents accounting for $2.6 million or 63 percent of total expenditures. Expenditures on non-consumptive activities accounted for 66 percent of all expenditures.

Table 5-34 summarizes the local economic effects associated with recreation visits. Final demand totaled $6.0 million with associated employment of 45 jobs, $1.9 million in employment income and $887,600 in total tax revenue.

Table 5-33. Edwin B. Forsythe NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$680.1	$2,034.4	$2,714.5
Hunting	$33.3	$11.3	$44.5
Fishing	$807.9	$517.5	$1,325.4
Total Expenditures	**$1,521.3**	**$2,563.2**	**$4,084.4**

Table 5-34. Edwin B. Forsythe NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$2,248.0	$3,757.7	$6,005.6
Jobs	18	26	45
Job Income	$706.2	$1,152.1	$1,858.3
Total Tax Revenue	$347.6	$540.0	$887.6

Table 5-35 shows total economic effects (total recreation expenditures plus net economic value). For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 5-35. Edwin B. Forsythe NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Edwin B. Forsythe NWR	NA	$4,084.4	$4,185.0	$8,269.4

Great Dismal Swamp National Wildlife Refuge

Description

The Great Dismal Swamp NWR is located in southeastern Virginia and northeastern North Carolina. It includes over 111,000-acres of forested wetlands, with Lake Drummond, a 3,100-acre lake, at its heart. The Great Dismal Swamp has long been considered a place of natural beauty, mystery, and legend. The swamp is an integral part of the cultural history of the region and remains a place of refuge for both wildlife and people.

The primary purpose of the refuge is to protect and preserve the unique and outstanding ecosystem, as well as protecting and perpetuating the diversity of animal and plant life therein. Essential to the swamp ecosystem are its water resources, native vegetative communities, and wildlife species. Water is being conserved and managed by placing water control structures in the ditches. Plant community diversity is being restored and maintained through forest management activities. Wildlife is managed by insuring the presence of required habitats, with hunting used to balance some wildlife populations with available food supplies.

The Great Dismal Swamp NWR is a matrix of unique habitat types, many of which are rare. Within the refuge are found typical pocosins of the southeast, some of the largest remaining Atlantic white cedar woodlands to be found anywhere, and managed habitat preparing for reintroduction of the federally-endangered red-cockaded woodpecker.

The secondary purpose of the refuge is to promote a public use program. The Dismal Swamp Canal, operated by the Army Corps of Engineers makes up the eastern boundary of the refuge. A water only entrance, the Feeder Ditch connects the Dismal Swamp Canal with Lake Drummond, at the center of the refuge. On the western side of the refuge, two trail entrances, Jericho and Washington Ditch, give access to some of the 100 miles of hiking trails in the refuge and the Railroad Ditch entrance provides limited auto access to Lake Drummond.

Area Economy

Table 5-36 shows the area economy. The area population increased by 16 percent from 2001 to 2011, compared with a 18 and 12 percent increases respectively for North Carolina and Virginia and a 9 percent increase for the U.S. as a whole. Area employment increased by 16 percent from 2001 to 2011, with North Carolina and Virginia each showing a 9 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 12 percent over the 2001-2011 period, North Carolina did not change, and Virginia and the U.S. increased by 9 and 5 percent respectively.

Table 5-36. Great Dismal Swamp NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Camden NC	10.0	41%	3.8	55%	$37,353	8%
Gates NC	12.0	14%	2.7	9%	$27,020	-1%
Pasquotank NC	40.7	17%	22.1	14%	$28,673	2%
Chesapeake (Independent City) VA	225.1	11%	122.3	14%	$42,504	14%
Suffolk (Independent City) VA	84.9	28%	34.5	26%	$39,279	13%
Area Total	**372.7**	**16%**	**185.3**	**16%**	**$39,620**	**12%**
North Carolina	9,656.4	18%	5,262.9	9%	$36,028	0%
Virginia	8,096.6	12%	4,800.8	9%	$46,107	9%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 5-37 shows the recreation visits for Great Dismal Swamp NWR. The Refuge had 65,320 visits in 2011. Non-consumptive recreation accounted for 63,750 visits with residents comprising 61 percent of Refuge visitation.

Table 5-37. Great Dismal Swamp NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	24,600	16,400	41,000
Auto Tour	690	1,610	2,300
Boat Trail/Launch	1,013	338	1,350
Bicycle	3,600	900	4,500
Interpretation	1,440	960	2,400
Photography	7,320	4,880	12,200
Other Recreation	0	0	0
Hunting:			
Big Game	828	552	1,380
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	143	48	190
Saltwater	0	0	0
Total Visitation	**39,633**	**25,687**	**65,320**

Regional Economic Analysis

The economic area for the Refuge is the area depicted inTable 5-36. It is assumed that visitor expenditures occur primarily within this study area. Visitor recreation expenditures for 2011 are shown in Table 5-38. Total expenditures were $1.6 million with non-residents accounting for $1.3 million or 78 percent of total expenditures. Expenditures on non-consumptive activities accounted for 97 percent of all expenditures.

Table 5-39 summarizes the local economic effects associated with recreation visits. Final demand totaled $2.4 million with associated employment of 22 jobs, $708,500 in employment income and $157,500 in total tax revenue.

Table 5-38. Great Dismal Swamp NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$334.6	$1,242.7	$1,577.3
Hunting	$17.9	$29.5	$47.4
Fishing	$2.4	$2.7	$5.0
Total Expenditures	**$354.8**	**$1,274.9**	**$1,629.7**

Table 5-39. Great Dismal Swamp NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$529.7	$1,900.0	$2,429.7
Jobs	5	17	22
Job Income	$153.0	$555.5	$708.5
Total Tax Revenue	$37.0	$120.5	$157.5

Table 5-40 shows total economic effects (total recreation expenditures plus net economic value) compared with the district budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $1.70 means that for every $1 of budget expenditures, $1.70 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 5-40. Great Dismal Swamp NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Great Dismal Swamp NWR	$1,951.3	$1,629.7	$1,693.8	$1.70

Great Swamp National Wildlife Refuge

Description

The Great Swamp National Wildlife Refuge was established in 1960 and lies 26 miles west of New York City's Times Square and seven miles south of Morristown, New Jersey in Morris County. This oasis of wilderness, surrounded by urban and suburban areas, provides important habitats to fish and wildlife and a unique opportunity for the public to enjoy wildlife and wilderness within close proximity to urban centers. It consists of approximately 7,800 acres of freshwater mixed hardwood swamp, cattail marsh, grassland, hardwood forest, ponds, and meandering streams. The refuge is a resting and feeding area for more than 244 species of birds, many of which also nest on the refuge. The refuge provides a "home" for more than 39 species of reptiles and amphibians, 29 species of fish, 33 species of mammals and approximately 600 species of plants from both the Northern and Southern Botanical Zones (including 215 species of wildflowers). Additionally, 26 of these wildlife species are listed by New Jersey as threatened or endangered, including the wood turtle, blue-spotted salamander, bog turtle (federally threatened), and Indiana bat (federally endangered).

Approximately 165,000 people visit the refuge annually. The Helen C. Fenske Visitor Center, the Wildlife Observation Center, and vistas along Pleasant Plains Road are focal points for visitation. People are encouraged to observe, study, photograph, and hike in designated areas. The visitor center offers information, interactive exhibits, trails, and more. The Wildlife Observation Center provides spectacular wetlands vistas and is particularly good for photography and wildlife observation. There is over one mile of boardwalk trails, interpretive displays, an information kiosk, and three blinds for observing wildlife. Pleasant Plains Road offers great viewing and photography opportunities. The refuge's Wilderness Area, the first designated Wilderness within the Department of the Interior, offers the more adventurous visitor over eight miles of primitive trails and an unconfined backcountry experience.

Area Economy

The Great Swamp NWR is located in northern New Jersey. Table 5-41 shows the area economy. The area population increased by 2 percent from 2001 to 2011, compared with a 4 percent increase for New Jersey and a 9 percent increase for the U.S. as a whole. Area employment increased by 3 percent from 2001 to 2011, with New Jersey showing a 5 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 3 percent over the 2001-2011 period, while New Jersey and the U.S. increased by 4 and 5 percent respectively.

Table 5-41. Great Swamp NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Bergen NJ	911.0	3%	599.0	4%	$66,096	0%
Essex NJ	785.1	-1%	456.7	1%	$52,956	10%
Morris NJ	495.0	5%	374.9	5%	$71,730	0%
Somerset NJ	324.9	8%	225.1	3%	$73,011	2%
Union NJ	539.5	3%	288.8	-1%	$51,860	1%
Area Total	**3,055.5**	**2%**	**1,944.4**	**3%**	**$61,854**	**3%**
New Jersey	8,821.2	4%	4,984.0	5%	$52,430	4%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 5-42 shows the recreation visits for Great Swamp NWR. The Refuge had 183,441 visits in 2011. Non-consumptive recreation accounted for 182,776 visits with residents comprising 87 percent of Refuge visitation.

Table 5-42. Great Swamp NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	114,750	20,250	135,000
Auto Tour	25,650	1,350	27,000
Boat Trail/Launch	0	0	0
Bicycle	5,742	58	5,800
Interpretation	1,923	19	1,942
Photography	10,400	2,600	13,000
Other Recreation	34	0	34
Hunting:			
Big Game	466	200	665
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	**158,964**	**24,477**	**183,441**

Regional Economic Analysis

The economic area for the Refuge is Bergen, Essex, Morris, Somerset, and Union Counties in New Jersey. It is assumed that visitor expenditures occur primarily within this 5-county study area. Visitor recreation expenditures for 2011 are shown in
Table 5-43. Total expenditures were nearly $1.8 million with non-residents accounting for $892,800 or just about 50 percent of total expenditures. Expenditures on non-consumptive activities accounted for 99 percent of all expenditures.

Table 5-44 summarizes the local economic effects associated with recreation visits. Final demand totaled $3.2 million with associated employment of 19 jobs, $1.0 million in employment income and $472,500 in total tax revenue.

Table 5-43. Great Swamp NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$883.0	$882.1	$1,765.1
Hunting	$10.0	$10.7	$20.7
Fishing	$0.0	$0.0	$0.0
Total Expenditures	**$893.0**	**$892.8**	**$1,785.8**

Table 5-44. Great Swamp NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$1,575.3	$1,583.7	$3,159.0
Jobs	10	9	19
Job Income	$502.2	$503.2	$1,005.5
Total Tax Revenue	$241.2	$231.3	$472.5

Table 5-45 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $3.51 means that for every $1 of budget expenditures, $3.51 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 5-45. Great Swamp NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Great Swamp NWR	$1,374.5	$1,785.8	$3,038.6	$3.51

John Heinz at Tinicum National Wildlife Refuge

Description

The John Heinz at Tinicum NWR is located in Philadelphia and Delaware Counties, Pennsylvania about 1 mile from Philadelphia International Airport. The refuge was established by an act of Congress in 1972 to protect the largest remaining freshwater tidal marsh in Pennsylvania; approximately 200 acres. Currently the refuge contains 993 acres of varied habitats within an authorized 1200 acre authorized acquisition boundary. The refuge provides important resting and feeding habitat for more than 300 species of migratory birds, 85 of which have been recorded nesting on site, including bald eagles and a number of state threatened/endangered species. Fox, deer, muskrat, turtles, frogs, fish, butterflies and a wide variety of wildflowers thrive within the refuge, which is located along the Atlantic Flyway. Congressional mandate for the refuge is to protect, preserve and enhance wildlife habitat; promote environmental education; and provide compatible public outdoor recreation opportunities.

Area Economy

John Heinz NWR is located in Philadelphia in Pennsylvania. Table 5-46 shows the area economy. The area population increased by 2 percent from 2001 to 2011, compared with a 4 percent increase for Pennsylvania and a 9 percent increase for the U.S. as a whole. Area employment increased by 3 percent from 2001 to 2011, with Pennsylvania showing a 4 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 14 percent over the 2001-2011 period, while Pennsylvania and the U.S. increased by 9 and 5 percent respectively.

Table 5-46. John Heinz NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Delaware PA	559.5	1%	290.7	5%	$49,795	4%
Philadelphia PA	1,536.5	2%	784.8	3%	$39,041	20%
Area Total	**2,096.0**	**2%**	**1,075.5**	**3%**	**$41,912**	**14%**
Pennsylvania	12,742.9	4%	7,222.3	4%	$42,291	9%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 5-47 shows the recreation visits for John Heinz NWR. The Refuge had 177,435 visits in 2011. Non-consumptive recreation accounted for 172,122 visits with residents comprising 95 percent of Refuge visitation.

Table 5-47. John Heinz NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	126,189	6,642	132,830
Auto Tour	0	0	0
Boat Trail/Launch	285	15	300
Bicycle	4,410	90	4,500
Interpretation	14,329	754	15,083
Photography	11,955	1,328	13,283
Other Recreation	6,003	123	6,126
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	5,207	106	5,313
Saltwater	0	0	0
Total Visitation	**168,377**	**9,058**	**177,435**

Regional Economic Analysis

The economic area for the Refuge is Delaware and Philadelphia Counties in Pennsylvania. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 5-48. Total expenditures were $1.4 million with non-residents accounting for $338,700 or 24 percent of total expenditures. Expenditures on non-consumptive activities accounted for 97 percent of all expenditures.

Table 5-49 summarizes the local economic effects associated with recreation visits. Final demand totaled $2.5 million with associated employment of 18 jobs, $811,500 in employment income and $329,100 in total tax revenue.

Table 5-48. John Heinz NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$1,029.9	$335.8	$1,365.7
Hunting	$0.0	$0.0	$0.0
Fishing	$43.1	$3.0	$46.1
Total Expenditures	**$1,073.0**	**$338.7**	**$1,411.8**

Table 5-49. John Heinz NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$1,920.4	$608.0	$2,528.4
Jobs	14	4	18
Job Income	$617.0	$194.5	$811.5
Total Tax Revenue	$253.2	$75.9	$329.1

Table 5-50 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $4.60 means that for every $1 of budget expenditures, $4.60 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 5-50. John Heinz NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
John Heinz NWR	$1,018.1	$1,411.8	$3,268.3	$4.60

Maine Coastal Islands National Wildlife Refuge

Description

The Maine Coastal Islands NWR Complex includes five national wildlife refuges: Petit Manan, Cross Island, Franklin Island, Seal Island, and Pond Island. These contain 58 islands and four mainland units, totaling more than 8,100 acres, spanning over 250 miles of Maine coastline. Refuge islands provide nesting habitat for eagles, wading birds and seabirds - including common, Arctic, and endangered roseate terns, Atlantic puffins, razorbills, black guillemots, Leach's storm-petrels, herring gulls, great black-backed gull, laughing gulls, double-crested cormorants, great cormorants and common eiders. Several of these birds are rare in the United States; Atlantic puffins and razorbills can only be found in Maine, common eiders are plentiful here but rare further south, and Arctic terns are only found here and in Alaska. Many companies capitalize on this, offering seabird viewing tour boat trips popular with tourists out and around these refuge islands.

Over the last 25 years, the Service and its conservation partners, through intensive management of seabird colonies - hiring almost 30 students each year who reside on a handful of islands during the summer nesting season - have reversed the decline in these birds' populations and many species have returned to islands where they nested historically. Continued intensive management of the terns and alcids (diving seabirds) is necessary to insure *any* productivity of these birds in the face of intensive predation by human-subsidized, high populations of large gulls, who eat eggs and chicks if given free rein. The islands are also important to migrating shorebirds, songbirds, and bats.

The mainland divisions, located “downeast” in Hancock and Washington Counties, provide habitat for songbirds, shorebirds, and waterfowl, as well as opportunities for bird watching and hiking.

The refuge’s 8 full-time employees are divided between two offices two hours drive time apart– one in leased space in Milbridge, Maine, and a new headquarters and visitor center (just opening – no exhibits or visitors yet!) in Rockland, Maine. Each office has boats and the other equipment necessary to support island work. Staff are engaged in a great deal of research regarding seabird foraging locations and ecosystem research to assist understanding where best to place future offshore wind generator placement and how to mitigate climate change.

The employees also manage the unstaffed12,500 acre Sunkhaze Meadows NWR in Milford, Maine.

Area Economy

Maine Coastal Island NWR is a complex of five refuges on the coast of Maine. Table 5-51 shows the area economy. The area population increased by 1 percent from 2001 to 2011, compared with a 3 percent increase for Maine and a 9 percent increase for the U.S. as a whole. Area employment decreased by 3 percent from 2001 to 2011, with Maine showing a 1 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 7 percent over the 2001-2011 period, while Maine and the U.S. increased by 7 and 5 percent respectively.

Table 5-51. Maine Coastal Islands NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Hancock ME	54.6	5%	36.5	0%	$38,542	2%
Knox ME	39.7	0%	26.6	-3%	$38,777	5%
Sagadahoc ME	35.2	0%	20.8	-2%	$41,044	14%
Washington ME	32.6	-3%	16.6	-9%	$32,738	13%
Area Total	**162.1**	**1%**	**100.5**	**-3%**	**$37,975**	**7%**
Maine	1,328.2	3%	799.1	1%	$38,299	7%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 5-52 shows the recreation visits for Maine Coastal Islands NWR. The Refuge had 155,245 visits in 2011. Non-consumptive recreation accounted for 151,805 visits with residents comprising 28 percent of Refuge visitation.

Table 5-52. Maine Coastal Islands NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	2,944	4,416	7,360
Auto Tour	14	56	70
Boat Trail/Launch	14,369	43,106	57,475
Bicycle	0	0	0
Interpretation	6,570	19,710	26,280
Photography	13,935	41,805	55,740
Other Recreation	2,440	2,440	4,880
Hunting:			
Big Game	409	22	430
Small Game	423	47	470
Migratory Birds	918	102	1,020
Fishing:			
Freshwater	0	0	0
Saltwater	1,216	304	1,520
Total Visitation	**43,237**	**112,008**	**155,245**

Regional Economic Analysis

The economic area for the Refuge is Hancock, Knox, Sagadahoc, and Washington Counties in Maine. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 5-53. Total expenditures were $5.4 million with non-residents accounting for $5.0 million or 93 percent of total expenditures. Expenditures on non-consumptive activities accounted for 99 percent of all expenditures.

Table 5-54 summarizes the local economic effects associated with recreation visits. Final demand totaled $7.9 million with associated employment of 71 jobs, $2.2 million in employment income and $930,700 in total tax revenue.

Table 5-53. Maine Coastal Islands NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$301.1	$5,006.3	$5,307.4
Hunting	$24.3	$5.1	$29.4
Fishing	$32.6	$15.7	$48.3
Total Expenditures	**$358.1**	**$5,027.0**	**$5,385.1**

Table 5-54. Maine Coastal Islands NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$529.1	$7,344.9	$7,874.0
Jobs	5	66	71
Job Income	$153.0	$2,050.0	$2,203.0
Total Tax Revenue	$67.8	$863.0	$930.7

Table 5-55 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $5.13 means that for every $1 of budget expenditures, $5.13 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 5-55. Maine Coastal Islands NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Maine Coastal Islands NWR	$1,731.4	$5,385.1	$3,495.8	$5.13

Moosehorn National Wildlife Refuge

Description

Moosehorn NWR provides important feeding and nesting habitat for many bird species, including neo-tropical migrants, waterfowl, wading birds, shorebirds, upland game birds, and birds of prey.

The refuge serves as a Land Management Research and Demonstration area for the Northern Forest. Unique study areas managed as early succession habitat for American woodcock and late succession forest management areas for Bay-breasted warbler and other species. Black bear, coyote, otter, moose and other wildlife of the North inhabit the refuge and are enjoyed by the public.

The refuge covers over 29,235 in two divisions. Baring located off U.S. Route 1, southwest of Calais and Edmunds between Dennysville and Whiting on U.S. Route 1 and borders the tidal waters of Cobscook Bay. Each division contains a National Wilderness Area, thousands of acres managed to preserve their wild character for future generation.

Area Economy

Moosehorn NWR is located in east central Maine. Table 5-56 shows the area economy. The area population decreased by 3 percent from 2001 to 2011, compared with a 3 percent increase for Maine and a 9 percent increase for the U.S. as a whole. Area employment decreased by 9 percent from 2001 to 2011, with Maine showing a 1 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 13 percent over the 2001-2011 period, while Maine and the U.S. increased by 7 and 5 percent respectively.

Table 5-56. Moosehorn NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Washington ME	32.6	-3%	16.6	-9%	$32,738	13%
Maine	1,328.2	3%	799.1	1%	$38,299	7%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 5-57 shows the recreation visits for Moosehorn NWR. The Refuge had 22,396 visits in 2011. Non-consumptive recreation accounted for 20,061 visits with residents comprising 52 percent of Refuge visitation.

Table 5-57. Moosehorn NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	4,400	4,400	8,800
Auto Tour	150	150	300
Boat Trail/Launch	1,850	1,850	3,700
Bicycle	555	555	1,110
Interpretation	75	0	75
Photography	38	38	76
Other Recreation	3,000	3,000	6,000
Hunting:			
Big Game	275	0	275
Small Game	170	0	170
Migratory Birds	279	11	290
Fishing:			
Freshwater	800	800	1,600
Saltwater	0	0	0
Total Visitation	**11,592**	**10,804**	**22,396**

Regional Economic Analysis

The economic area for the Refuge is Washington County, Maine. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2011 are shown in Table 5-58. Total expenditures were $319,500 with non-residents accounting for $267,000 or 84 percent of total expenditures. Expenditures on non-consumptive activities accounted for 92 percent of all expenditures.

Table 5-59 summarizes the local economic effects associated with recreation visits. Final demand totaled $414,800 with associated employment of 5 jobs, $119,500 in employment income and $48,500 in total tax revenue.

Table 5-58. Moosehorn NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$43.3	$251.9	$295.2
Hunting	$4.8	$0.1	$4.9
Fishing	$4.4	$15.0	$19.4
Total Expenditures	**$52.5**	**$267.0**	**$319.5**

Table 5-59. Moosehorn NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$70.7	$344.1	$414.8
Jobs	1	4	5
Job Income	$19.7	$99.9	$119.5
Total Tax Revenue	$8.5	$40.0	$48.5

Table 5-60 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $0.52 means that for every $1 of budget expenditures, $0.52 of total recreational economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 5-60. Moosehorn NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Moosehorn NWR	$1,158.5	$319.5	$282.9	$0.52

Occoquan National Wildlife Refuge

Description

Occoquan Bay NWR is a 644 acre parcel on a peninsula bordered by the sandy river shoreline of Belmont Bay, Occoquan Bay and the tidal flats of Marumsco Creek. Occoquan Bay NWR is made up of two parcels formerly known as the Marumsco NWR and the Woodbridge Research Facility. Marumsco NWR had been established in 1973 when the Army excessed the creek portion of the property. The research facility, which served as an Army communications in the 1950'a and 1960's and a top secret research center in the 1970's and 1980's, closed its operations in September of 1994 under the Base Realignment and Closure Act (BRAC). The site was formally transferred to the U.S. Fish and Wildlife Service in June 1998. Recombining the two parcels with the new name Occoquan Bay gave the site more community recognition and management capability.

Occoquan Bay NWR contains a diversity of grassland and wetland plant species unusual in the heavily developed Potomac region. Its diverse habitats support a correspondingly high number of wildlife species, particularly migrant land and waterbirds and grassland nesting species with 246 species documented on the refuge. Wetland habitats cover about 50 percent of the site, and include wet meadows, bottomland hardwoods, open freshwater marsh, and tidally influenced marshes and streams. About 20 percent of the unit is upland meadows, with the remaining vegetated areas consisting of shrub and mature or second growth forest. The refuge is managed to provide early successional habitats and appropriate wildlife dependent recreational opportunities, to educate visitors on the results and benefits of habitat management for wildlife, and for the enjoyment and benefit of people.

Area Economy

Occoquan NWR is located in eastern Virginia. Table 5-61 shows the area economy. The area population increased by 18 percent from 2001 to 2011, compared with a 12 percent increase for Virginia and a 9 percent increase for the U.S. as a whole. Area employment increased by 16 percent from 2001 to 2011, with Virginia showing a 9 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 3 percent over the 2001-2011 period, while Virginia and the U.S. increased by 9 and 5 percent respectively.

Table 5-61. Occoquan NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Fairfax, Fairfax City + Falls Church	1,136.0	11%	853.3	13%	$69,008	4%
Prince William, Manassas + Manassas Park	473.6	37%	193.2	30%	$44,986	9%
Area Total	**1,609.6**	**18%**	**1,046.5**	**16%**	**$61,939**	**3%**
Virginia	8,096.6	12%	4,800.8	9%	$46,107	9%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 5-62 shows the recreation visits for Occoquan NWR. The Refuge had 25,438 visits in 2011. Non-consumptive recreation accounted for 25,358 visits with residents comprising 96 percent of Refuge visitation.

Table 5-62. Occoquan NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	9,504	396	9,900
Auto Tour	9,816	409	10,225
Boat Trail/Launch	0	0	0
Bicycle	72	3	75
Interpretation	195	10	205
Photography	4,755	198	4,953
Other Recreation	0	0	0
Hunting:			
Big Game	64	16	80
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	**24,406**	**1,032**	**25,438**

Regional Economic Analysis

The economic area for the Refuge is Fairfax County, Fairfax City, Falls Church City, Prince William County, Manassas, and Manassas Park in Virginia. It is assumed that visitor expenditures occur primarily within these counties and independent cities. Visitor recreation expenditures for 2011 are shown in Table 5-63. Total expenditures were $170,600 with non-residents accounting for $34,000 or 20 percent of total expenditures. Expenditures on non-consumptive activities accounted for 99 percent of all expenditures.

Table 5-64 summarizes the local economic effects associated with recreation visits. Final demand totaled $241,400 with associated employment of 3 jobs, $76,400 in employment income and $37,600 in total tax revenue.

Table 5-63. Occoquan NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$135.3	$33.1	$168.4
Hunting	$1.4	$0.9	$2.2
Fishing	$0.0	$0.0	$0.0
Total Expenditures	**$136.7**	**$34.0**	**$170.6**

Table 5-64. Occoquan NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$193.8	$47.6	$241.4
Jobs	2	1	3
Job Income	$61.6	$14.8	$76.4
Total Tax Revenue	$30.6	$7.0	$37.6

Table 5-65 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 5-65. Occoquan NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Occoquan NWR	NA	$170.6	$413.8	$584.5

Stewart B. McKinney National Wildlife Refuge

Description

Stewart B. McKinney NWR is comprised of ten different units that are stretched across Connecticut's shoreline. The headquarters is located approximately 45 minutes south of Hartford and 30 minutes east of New Haven in Westbrook, Connecticut.

Salt Meadow NWR was established in 1972 and redesignated by Congress as the Connecticut Coastal National Wildlife Refuge in 1984. The refuge was renamed in 1987 to honor the late U.S. Congressman Stewart B. McKinney, who was instrumental in its establishment. The ten units of the Stewart B. McKinney National Wildlife Refuge span 70 miles of Connecticut coastline.

Located in the Atlantic Flyway, the refuge provides important resting, feeding, and nesting habitat for many species of wading birds, shorebirds, songbirds and terns, including the endangered roseate tern. Adjacent waters serve as wintering habitat for brant, scoters, American black duck and other waterfowl. Overall, the refuge encompasses over 800 acres of barrier beach, tidal wetland and fragile island habitats. Salt Meadow Unit, in Westbrook, CT, and Falkner Island Unit, three miles off the coast of Guilford, CT, have both been designation as an "Important Bird Area" by the National Audubon Society. Falkner Island Unit is home to over 40 pairs of nesting Federally Endangered Roseate Terns and over 2,500 nesting pairs of common terns. Salt Meadow Unit is used by over 280 species of migrating neotropical birds during the spring and fall migrations.

Area Economy

Stewart NWR is located in southwestern Connecticut. Table 5-66 shows the area economy. The area population increased by 4 percent from 2001 to 2011, compared with a 4 percent increase for Connecticut and a 9 percent increase for the U.S. as a whole. Area employment increased by 5 percent from 2001 to 2011, with Connecticut showing a 4 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 3 percent over the 2001-2011 period, while Connecticut and the U.S. both increased by 5 percent.

Table 5-66. Stewart B. McKinney NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Fairfield CT	925.9	4%	612.9	7%	$78,504	0%
Middlesex CT	166.0	6%	94.3	4%	$54,198	6%
New Haven CT	861.1	4%	483.7	3%	$49,478	8%
Area Total	**1,953.1**	**4%**	**1,190.9**	**5%**	**$63,640**	**3%**
Connecticut	3,580.7	4%	2,203.2	4%	$57,902	5%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 5-67 shows the recreation visits for Stewart B. McKinney NWR. The Refuge had 14,935 visits in 2011. Non-consumptive recreation accounted for 14,890 visits with residents comprising 87 percent of Refuge visitation.

Table 5-67. Stewart B. McKinney NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	9,025	475	9,500
Auto Tour	0	0	0
Boat Trail/Launch	665	35	700
Bicycle	0	0	0
Interpretation	3,325	175	3,500
Photography	0	1,190	1,190
Other Recreation	0	0	0
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	23	23	45
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	**13,038**	**1,898**	**14,935**

Regional Economic Analysis

The economic area for the Refuge is Fairfield, Middlesex, and New Haven Counties in Connecticut. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 5-68. Total expenditures were $217,500 with non-residents accounting for $109,200 or 50 percent of total expenditures. Expenditures on non-consumptive activities accounted for 99 percent of all expenditures.

Table 5-69 summarizes the local economic effects associated with recreation visits. Final demand totaled $388,900 with associated employment of 2 jobs, $129,700 in employment income and $62,400 in total tax revenue.

Table 5-68. Stewart B. McKinney NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$107.6	$108.2	$215.8
Hunting	$0.7	$1.0	$1.7
Fishing	$0.0	$0.0	$0.0
Total Expenditures	**$108.3**	**$109.2**	**$217.5**

Table 5-69. Stewart B. McKinney NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$194.8	$194.1	$388.9
Jobs	1	1	2
Job Income	$64.7	$65.0	$129.7
Total Tax Revenue	$31.8	$30.5	$62.4

Table 5-70 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $1.21 means that for every $1 of budget expenditures, $1.21 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 5-70. Stewart B. McKinney NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Stewart B. McKinney NWR	$486.2	$217.5	$368.7	$1.21

Region 6

Region 6 includes the states of Colorado, Kansas, Montana, North Dakota, Nebraska, South Dakota, Utah, and Wyoming. Sample refuges and management districts selected within this region include:

Alamosa NWR (Colorado)
Flint Hills NWR (Kansas)
J. Clark Salyer NWR (North Dakota)
Marais des Cygnes NWR (Kansas)
National Bison Range (Montana)
Sand Lake NWR (South Dakota)
Seedskadee and Cokeville Meadows NWR (Wyoming)
Tewaukon NWR (North Dakota)
Valentine NWR (Nebraska)
Waubay WMD (South Dakota)

Alamosa National Wildlife Refuge

Description

Alamosa National Wildlife Refuge (NWR) is located in southeastern Colorado, approximately 220 miles south of Denver CO and 150 miles north of Santa Fe NM, and is part of the Alamosa/Monte Vista/Baca National Wildlife Refuge Complex. The Refuge was established in 1962 as a haven for migratory birds and other wildlife. 14,345 foot Mt. Blanca of the Sangre de Cristo Mountains provides a stunning backdrop for this 11,169 acre refuge. Alamosa NWR consists of wet meadows, river oxbows and riparian corridor primarily within the flood plain of the Rio Grande, and dry uplands vegetated with greasewood and saltbush.

The 12,026 acres that make up Alamosa NWR include upland areas, riparian corridors, wet meadows, and river oxbows. The wetland and river habitats provide a wildlife oasis in this dry region. These habitats support a variety of wildlife, including songbirds, water birds, raptors, deer, beaver, coyotes, and more. The mission of the Alamosa NWR is to provide food, cover, migration, and breeding habitat for migratory birds and other wildlife. The Refuge conserves and enhances the mixture of wetland and desert habitats found in the area to accomplish these goals. Habitat management tools used on the Refuges include water and wetland management, farming, grazing, and prescribed fire.

Area Economy

Table 6-1 shows the area economy for Alamosa NWR. The area population increased by 2 percent from 2001 to 2011, compared with a 16 percent increase for Colorado and a 9 percent increase for the U.S. as a whole. Area employment increased by 4 percent from 2001 to 2011, with Colorado showing a 10 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 15 percent over the 2001-2011 period, while Colorado per capita income declined by 2 percent and the U.S. increased by 5 percent.

Table 6-1. Alamosa NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Alamosa	15,710	5%	10,558	6%	$33,402	18%
Rio Grande	11,956	-2%	6,962	-2%	$34,051	12%
Area Total	**27.666**	**2%**	**17,520**	**4%**	**$33,727**	**15%**
Colorado	5,100.0	16%	3,200.0	10%	$44,053	-2%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 6-2 shows the recreation visits for Alamosa NWR. The Refuge had 3,260 visits in 2011. Non-consumptive recreation accounted for 2,660 visits with residents comprising 80 percent of Refuge visitation.

Table 6-2. Alamosa NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	360	40	400
Auto Tour	1,560	520	2,080
Boat Trail/Launch	0	0	0
Bicycle	48	3	50
Interpretation	60	20	80
Photography	38	13	50
Other Recreation	0	0	0
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	540	60	600
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	**2,605**	**655**	**3,260**

Regional Economic Analysis

The economic area for the Refuge is Alamosa and Rio Grande Counties in Colorado. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 6-3. Total expenditures were $38,800 with non-residents accounting for $18,300 or 47 percent of total expenditures. Expenditures on non-consumptive activities accounted for 69 percent of all expenditures.

Table 6-4 summarizes the local economic effects associated with recreation visits. Final demand totaled $45,000 with associated employment of 2 jobs, $14,100 in employment income and $6,100 in total tax revenue.

Table 6-3. Alamosa NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$12.6	$14.2	$26.8
Hunting	$7.9	$4.1	$12.0
Fishing	$0.0	$0.0	$0.0
Total Expenditures	**$20.5**	**$18.3**	**$38.8**

Table 6-4. Alamosa NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$25.1	$19.9	$45.0
Jobs	1	1	2
Job Income	$7.9	$6.2	$14.1
Total Tax Revenue	$3.5	$2.7	$6.1

Table 6-5 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 6-5. Alamosa NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Alamosa NWR	N/A	$38.8	$37.9	$76.7

Flint Hills National Wildlife Refuge

Description

The Flint Hills National Wildlife Refuge is located in the broad, flat Neosho River Valley within the tallgrass prairie region of the United States. It is an "overlay project" on a U.S. Army Corps of Engineers flood control reservoir. The entire 18,463 acres are owned by the U.S. Army Corps of Engineers but managed by the U.S. Fish and Wildlife Service for the benefit of fish and wildlife. The Neosho and Cottonwood Rivers provide most of the water for the refuge until the John Redman reservoir backs up during flood events. The refuge is composed of uplands, grasslands, agricultural lands, hardwood river bottoms, marshes, and flooded sloughs. It is managed primarily for migratory waterfowl, with consideration given to resident and other migratory species of birds. A secondary function is to provide an opportunity for the public to observe, study, harvest and enjoy wildlife and plants in their natural environment. Prescribed fire is an extremely important tool used on the refuge to maintain and restore prairie habitats.

The refuge has 294 bird species that utilize refuge lands for feeding, breeding, and migratory purposes. It is a haven for white-tailed deer, wild turkey, bobwhite quail, and an assortment of other mammals, reptiles, and insects.

Area Economy

Flint Hills NWR is located in east central Kansas. Table 6-6 shows the area economy. The area population decreased by 6 percent from 2001 to 2011, compared with a 6 percent increase for Kansas and a 9 percent increase for the U.S. as a whole. Area employment decreased by 10 percent from 2001 to 2011, with Kansas showing a 3 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 12 percent over the 2001-2011 period, while Kansas and the U.S. increased by 9 and 5 percent respectively.

Table 6-6. Flint Hills NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Coffey KS	8.5	-3%	6.5	6%	$46,517	28%
Lyon KS	33.8	-6%	18.8	-14%	$29,493	7%
Area Total	**42.3**	**-6%**	**25.3**	**-10%**	**$32,927**	**12%**
Kansas	2,871.2	6%	1,825.4	3%	$40,883	9%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 6-7 shows the recreation visits for Flint Hills NWR. The Refuge had 4,410 visits in 2011. Non-consumptive recreation accounted for 2,270 visits with residents comprising 70 percent of Refuge visitation.

Table 6-7. Flint Hills NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	165	135	300
Auto Tour	660	540	1,200
Boat Trail/Launch	225	25	250
Bicycle	0	0	0
Interpretation	270	30	300
Photography	75	25	100
Other Recreation	60	60	120
Hunting:			
Big Game	74	137	210
Small Game	8	18	25
Migratory Birds	471	235	705
Fishing:			
Freshwater	1,080	120	1,200
Saltwater	0	0	0
Total Visitation	**3,087**	**1,324**	**4,410**

Regional Economic Analysis

The economic area for the Refuge is Coffey and Lyon Counties in Kansas. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 6-8. Total expenditures were $139,100 with non-residents accounting for $88,600 or 64 percent of total expenditures. Expenditures on non-consumptive activities accounted for 40 percent of all expenditures, followed by hunting (38 percent) and fishing (21 percent).

Table 6-9 summarizes the local economic effects associated with recreation visits. Final demand totaled $164,400 with associated employment of 2 jobs, $49,400 in employment income and $21,400 in total tax revenue.

Table 6-8. Flint Hills NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$18.2	$38.1	$56.3
Hunting	$10.6	$42.4	$53.0
Fishing	$21.7	$8.1	$29.8
Total Expenditures	**$50.5**	**$88.6**	**$139.1**

Table 6-9. Flint Hills NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$58.7	$105.8	$164.4
Jobs	1	1	2
Job Income	$17.4	$32.0	$49.4
Total Tax Revenue	$7.7	$13.7	$21.4

Table 6-10 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $0.34 means that for every $1 of budget expenditures, $0.34 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 6-10. Flint Hills NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Flint Hills NWR	$740.5	$139.1	$110.6	$0.34

J. Clark Salyer National Wildlife Refuge

Description

J. Clark Salyer National Wildlife Refuge is located along the Souris River in north-central North Dakota. This 58,700-acre Refuge extends south from the Canadian border for approximately 45 miles and is the largest refuge in North Dakota. The diverse habitat types found on the refuge - mixed grass prairie, river valley, marshes, sandhills, and woodlands - support an abundant variety of wildlife.

The Refuge serves as an important feeding and resting area for hundreds of thousands of waterfowl which annually migrate through the Central Flyway. The refuge has developed into one of the most important duck production areas in the United States and is a favorite spot for birds of all descriptions to stop during their migrations north and south. More than 300 species of birds have been observed here since the refuge was established. Nearly 125 species nest here. Gadwall, blue-winged teal, mallard, and Canada goose are the most numerous nesting waterfowl. Many species of shorebirds and grebes, the white pelican, sandhill crane, lark bunting, longspurs, and the sparrows- including Baird's and LeConte's, are among the list that take summer residence on the refuge. The Refuge is designated as a Globally Important Bird Area and is a regional site in the Western Hemisphere Shorebird Reserve Network.

Area Economy

Table 6-11 shows the area economy for J. Clark Salyer NWR. The area population increased by 7 percent from 2001 to 2011, compared with a 7 percent increase for North Dakota and a 9 percent increase for the U.S. as a whole. Area employment increased by 15 percent from 2001 to 2011, with North Dakota showing a 19 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 35 percent over the 2001-2011 period, while North Dakota and the U.S. increased by 40 and 5 percent respectively.

Table 6-11. J. Clark Salyer NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Bottineau ND	6.4	-8%	4.9	10%	$44,061	35%
McHenry ND	5.5	-6%	3.0	5%	$35,784	31%
Ward ND	64.1	10%	46.1	17%	$45,976	35%
Area Total	**76.0**	**7%**	**54.1**	**15%**	**$45,076**	**35%**
North Dakota	683.9	7%	527.0	19%	$47,236	40%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 6-12 shows the recreation visits for J. Clark Salyer NWR. The Refuge had 80,340 visits in 2011. Non-consumptive recreation accounted for 15,395 visits with residents comprising 68 percent of Refuge visitation.

Table 6-12. J. Clark Salyer NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	830	830	1,660
Auto Tour	4,525	4,525	9,050
Boat Trail/Launch	20	5	25
Bicycle	40	10	50
Interpretation	280	120	400
Photography	404	3,636	4,040
Other Recreation	51	119	170
Hunting:			
Big Game	2,610	1,740	4,350
Small Game	460	115	575
Migratory Birds	1,491	3,279	4,770
Fishing:			
Freshwater	44,200	11,050	55,250
Saltwater	0	0	0
Total Visitation	**54,911**	**25,429**	**80,340**

Regional Economic Analysis

The economic area for the Refuge is Bottineau, McHenry, and Ward Counties in North Dakota. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 6-13. Total expenditures were $3.1 million with non-residents accounting for nearly $2.2 million or 69 percent of total expenditures. Expenditures on fishing activities accounted for 42 percent of all expenditures, followed by non-consumptive activities (33 percent) and hunting (25 percent).

Table 6-14 summarizes the local economic effects associated with recreation visits. Final demand totaled $4.4 million with associated employment of 40 jobs, $1.3 million in employment income and $575,300 in total tax revenue.

Table 6-13. J. Clark Salyer NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$121.3	$905.5	$1,026.7
Hunting	$135.2	$648.7	$783.9
Fishing	$710.3	$599.3	$1,309.7
Total Expenditures	**$966.8**	**$2,153.5**	**$3,120.3**

Table 6-14. J. Clark Salyer NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$1,360.8	$2,984.2	$4,345.0
Jobs	14	27	40
Job Income	$405.9	$911.5	$1,317.4
Total Tax Revenue	$183.6	$391.8	$575.3

Table 6-15 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $2.77 means that for every $1 of budget expenditures, $2.77 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 6-15. J. Clark Salyer NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
J. Clark Salyer NWR	$1,991.7	$3,120.3	$2,395.6	$2.77

Marais des Cygnes National Wildlife Refuge

Description

Marais des Cygnes National Wildlife Refuge lies where the Marais des Cygnes River flows through the transitioning landscape of tallgrass prairies to hardwood forests. These forests are some of the western-most reaches of the diverse and productive bottomland hardwood ecosystem of the southeastern U.S. Native tree species have been planted to reforest bottomland fields and additional restoration efforts bring back native prairies. The collection of forests, prairies and wetlands attract more than 320 species of birds, including 117 species that nest on the Refuge. Nearly 30 species of fresh water mussels are found in gravels beds within the nine miles of river flowing through the Refuge, and over 150 species of mammals, fish, reptiles and amphibians are found in the area.

Although the Refuge lies within a rural landscape, more than two million people live within 75 miles, including metropolitan Kansas City. Visitors come to the Refuge for hunting, fishing, photography, birding and hiking. The Refuge provides a growing number of environmental education opportunities and events.

Area Economy

Marais des Cygnes NWR is located in east central Kansas on the border with Missouri. Table 6-16 shows the area economy. The area population increased by 11 percent from 2001 to 2011, compared with a 6 and 7 percent increase for Kansas and Missouri, and a 9 percent increase for the U.S. as a whole. Area employment showed a 3 percent increase from 2001 to 2011, with Kansas and Missouri showing a 3 and 1 percent increase and the U.S. a 6 percent increase. Per capita income in the area a 2 percent increase over the 2001-2011 period, while Kansas, Missouri, and the U.S. increased by 9, 4, and 5 percent respectively.

Table 6-16. Marais des Cygnes NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Bourbon KS	15.0	-2%	9.2	-5%	$30,693	8%
Johnson KS	553.0	19%	409.0	10%	$56,550	0%
Leavenworth KS	77.2	10%	37.5	11%	$34,360	3%
Linn KS	9.6	-1%	4.0	-3%	$31,382	8%
Miami KS	32.7	14%	10.8	-7%	$42,131	18%
Wyandotte KS	158.2	0%	99.2	5%	$28,836	7%
Bates MO	17.0	1%	7.8	-1%	$32,429	2%
Cass MO	100.1	18%	37.4	15%	$35,244	-2%
Clay MO	225.2	20%	122.8	11%	$38,213	-6%
Jackson MO	676.4	3%	435.5	-6%	$40,564	2%
Platte MO	90.9	19%	52.8	18%	$44,561	1%
Area Total	**1,955.2**	**11%**	**1,226.0**	**3%**	**$43,369**	**2%**
Kansas	2,871.2	6%	1,825.4	3%	$40,883	9%
Missouri	6,010.7	7%	3,495.6	1%	$37,969	4%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 6-17 shows the recreation visits for Marais des Cygnes NWR. The Refuge had 3,295 visits in 2011. Non-consumptive recreation accounted for 2,110 visits with residents comprising 53 percent of Refuge visitation.

Table 6-17. Marais des Cygnes NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	23	128	150
Auto Tour	850	850	1,700
Boat Trail/Launch	40	10	50
Bicycle	0	0	0
Interpretation	18	2	20
Photography	30	70	100
Other Recreation	72	18	90
Hunting:			
Big Game	440	360	800
Small Game	60	40	100
Migratory Birds	62	24	85
Fishing:			
Freshwater	160	40	200
Saltwater	0	0	0
Total Visitation	**1,754**	**1,541**	**3,295**

Regional Economic Analysis

The economic area for the Refuge is Linn, Bourbon, Miami, Johnson, Leavenworth, Wyandotte counties in Kansas; Bates, Cass, Jackson, Clay and Platte in Missouri. It is assumed that visitor expenditures occur primarily within these five counties. Visitor recreation expenditures for 2011 are shown in Table 6-18. Total expenditures were $139,200 with non-residents accounting for $111,400 or 80 percent of total expenditures. Expenditures on hunting activities accounted for 72 percent of all expenditures, followed by non-consumptive activities (25 percent) and fishing (3 percent).

Table 6-19 summarizes the local economic effects associated with recreation visits. Final demand totaled $236,700 million with associated employment of 2 jobs, $72,000 in employment income and $30,800 in total tax revenue.

Table 6-18. Marais des Cygnes NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$6.3	$28.5	$34.8
Hunting	$19.0	$80.7	$99.7
Fishing	$2.6	$2.2	$4.7
Total Expenditures	**$27.9**	**$111.4**	**$139.2**

Table 6-19. Marais des Cygnes NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$47.2	$189.5	$236.7
Jobs	0	1	2
Job Income	$14.2	$57.8	$72.0
Total Tax Revenue	$6.2	$24.6	$30.8

Table 6-20 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $0.42 means that for every $1 of budget expenditures, $0.42 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 6-20. Marais des Cygnes NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Marais des Cygnes NWR	$509.6	$139.2	$73.5	$0.42

National Bison Range

Description

The National Bison Range, its two satellite refuges (Ninepipe and Pablo NWRs), and 9 units of the Northwest Montana Waterfowl Production Area (Lake County) are situated in the intermountain Mission Valley with spectacular views of the snowcapped Mission Mountains. Rolling hills, native intermountain prairie, and numerous glacial potholes provide diverse habitats for fish, wildlife and birds. Much of the valley was once inundated by prehistoric Lake Missoula, which was formed by a glacial dam on the Clark Fork River. Geologists believe the ice dam formed, broke, and reformed as many as 40 times over the time frame of 10,000 to 100,000 years ago. Old beach lines are still evident on north–facing slopes.

The National Bison Range, established by President Theodore Roosevelt in 1908, maintains a herd of 325-350 bison on 18,766 acres. These bison have a high level of genetic diversity, and, of all the federal herds currently tested, it has one of the highest levels of allelic richness, heterozygosity, and private alleles. It is one of the oldest wildlife refuges in the nation and has the distinction of being the first Congressional appropriations ever made for the purchase of lands for a wildlife refuge. The original herd of bison, on the other hand, was purchased with private money raised by the American Bison Society and donated to the Refuge. The Bison Range is visited each year by more than 120,000 people who experience excellent wildlife viewing and photographic opportunities. The refuge provides environmental education programs for more than 3,000 school children every year.

Ninepipe and Pablo NWRs are overlay refuges on Confederated Salish and Kootenai Tribal land surrounding irrigation reservoirs. The 1921 establishing legislation set up the refuges to function “as a refuge and breeding ground for native birds.” In conjunction with the nine units of the Northwest Montana WMD, the lands provide for numerous waterfowl and wetland birds, including a large number of duck species, grebes, great blue heron and double crested cormorant rookeries, breeding terns, bald eagle and osprey nests, avocets, stilts and phalaropes. The uplands provide for high concentrations of nesting northern harriers and short eared owls as well as wintering grounds for rough legged hawks. These are premier bird watching areas.

Area Economy

The National Bison Range is located in northwestern Montana. Table 6-21 shows the area economy. The area population increased by 15 percent from 2001 to 2011, compared with a 10 percent increase for Montana and a 9 percent increase for the U.S. as a whole. Area employment increased by 11 percent from 2001 to 2011, with Montana showing a 12 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 5 percent over the 2001-2011 period, while Montana and the U.S. increased by 12 and 5 percent respectively.

Table 6-21. National Bison Range: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Flathead MT	91.3	20%	57.9	15%	$35,875	7%
Lake MT	28.9	8%	13.5	1%	$27,536	11%
Missoula MT	110.1	13%	75.7	11%	$35,190	2%
Sanders MT	11.4	9%	5.2	1%	$26,061	11%
Area Total	**241.8**	**15%**	**152.4**	**11%**	**$34,101**	**5%**
Montana	998.2	10%	629.2	12%	$36,016	12%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 6-22 shows the recreation visits for the National Bison Range. The Range had 224,300 visits in 2011. Non-consumptive recreation accounted for 223,800 visits with non-residents comprising 83 percent of visitation.

Table 6-22. National Bison Range: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	9,200	48,300	57,500
Auto Tour	19,200	100,800	120,000
Boat Trail/Launch	0	0	0
Bicycle	225	75	300
Interpretation	104	546	650
Photography	9,000	36,000	45,000
Other Recreation	175	175	350
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	300	200	500
Saltwater	0	0	0
Total Visitation	**38,204**	**186,096**	**224,300**

Regional Economic Analysis

The economic area for the National Bison Range is Flathead, Lake, Missoula, and Sanders Counties in Montana. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 6-23. Total expenditures were $12.5 million with non-residents accounting for $11.9 million or 95 percent of total expenditures. Expenditures on non-consumptive activities accounted for nearly all of expenditures although a small amount of fishing does occur.

Table 6-24 summarizes the local economic effects associated with recreation visits. Final demand totaled $20.1 million with associated employment of 169 jobs, $5.7 million in employment income and $2.5 million in total tax revenue.

Table 6-23. National Bison Range: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$578.6	$11,869.2	$12,447.8
Hunting	$0.0	$0.0	$0.0
Fishing	$4.8	$10.8	$15.7
Total Expenditures	**$583.4**	**$11,880.0**	**$12,463.4**

Table 6-24. National Bison Range: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$977.7	$19,143.1	$20,120.8
Jobs	9	160	169
Job Income	$283.9	$5,442.4	$5,726.3
Total Tax Revenue	$127.4	$2,410.6	$2,538.0

Table 6-25 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $13.89 means that for every $1 of budget expenditures, $13.89 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 6-25. National Bison Range: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
National Bison Range	$1,213.8	$12,463.4	$4,396.7	$13.89

Sand Lake National Wildlife Refuge

Description

Sand Lake NWR was established in 1935 as a refuge and breeding ground for migratory birds and other wildlife and is now known for its spectacular concentrations of wildlife. Covering almost 21,500 acres, Sand Lake NWR is home to over 266 bird species, 40 mammal species, and a variety of fish, reptile, and amphibian species. Sand Lake NWR is a Globally Important Bird Area and has been named one of the top 15 birding sites in North America by *WildBird* magazine.

The Sand Lake Wetland Management District (WMD), was established in 1961 and is the largest WMD in the country, encompassing 45,000 acres of grasslands and wetlands on 162 Federally owned Waterfowl Production Areas. It protects over 550,000 acres of private land through wetland and grassland conservation easements in partnership with landowners; this land provides habitat for nesting and migrating birds and other wildlife, as well as year-round recreational opportunities. The habitat conserved on both Sand Lake NWR and Sand Lake WMD combined provide a landscape scale conservation effort for migratory birds and other wildlife.

Area Economy

Sand Lake NWR is located in northeastern South Dakota. Table 6-26 shows the area economy. The area population increased by 4 percent from 2001 to 2011, compared with a 9 percent increase for South Dakota and a 9 percent increase for the U.S. as a whole. Area employment increased by 5 percent from 2001 to 2011, with South Dakota showing a 10 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 27 percent over the 2001-2011 period, while South Dakota and the U.S. increased by 25 and 5 percent respectively.

Table 6-26. Sand Lake NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Brown SD	36.8	4%	27.7	5%	$50,274	27%
South Dakota	824.1	9%	564.4	10%	$44,217	25%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 6-27 shows the recreation visits for Sand Lake NWR. The Refuge had 9,193 visits in 2011. Hunting accounted for 8,628 visits, followed by non-consumptive activities (445 visits) and fishing (120 visits. Residents comprised 59 percent of Refuge visitation. Refuge visitation in 2011 was likely lower than average due to flooding related impacts to the refuge auto tour route road. Additionally, resident hunting visitation was lower due to a decrease in available refuge specific deer tags. The decrease in tags was a direct result of muli-years of high water and flooding that displaced the deer herd and decreased the population on the refuge.

Table 6-27. Sand Lake NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	113	38	150
Auto Tour	0	0	0
Boat Trail/Launch	0	0	0
Bicycle	14	1	15
Interpretation	144	16	160
Photography	66	44	110
Other Recreation	9	1	10
Hunting:			
Big Game	1,863	207	2,070
Small Game	2,230	3,345	5,575
Migratory Birds	882	101	983
Fishing:			
Freshwater	114	6	120
Saltwater	0	0	0
Total Visitation	**5,435**	**3,758**	**9,193**

Regional Economic Analysis

The economic area for the Refuge is Brown County, South Dakota. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2011 are shown in

Table 6-28. Total expenditures were $592,400 with non-residents accounting for $440,100 or 74 percent of total expenditures. Expenditures on hunting activities accounted for 98 percent of all expenditures.

Table 6-29 summarizes the local economic effects associated with recreation visits. Final demand totaled $800,700 with associated employment of 7 jobs, $235,000 in employment income and $100,200 in total tax revenue.

Table 6-28. Sand Lake NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$3.9	$5.9	$9.8
Hunting	$147.5	$434.1	$581.5
Fishing	$0.9	$0.2	$1.1
Total Expenditures	**$152.3**	**$440.1**	**$592.4**

Table 6-29. Sand Lake NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$217.2	$583.5	$800.7
Jobs	2	5	7
Job Income	$62.1	$172.9	$235.0
Total Tax Revenue	$27.7	$72.6	$100.2

Table 6-30 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $0.78 means that for every $1 of budget expenditures, $0.78 of total economic effects from recreation activities are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 6-30. Sand Lake NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Sand Lake NWR	$1,283.5	$592.4	$409.4	$0.78

Seedskadee and Cokeville Meadows National Wildlife Refuges

Description

The name Seedskadee originated from the Shoshone Indian word "Sisk-a-dee-agie" meaning "river of the prairie hen." The 27,230 acre Refuge protects a mosaic of riparian, wetland, and upland shrub habitats along 36 miles of the Green River. The river is an oasis that bisects the vast high desert sagebrush plains of southwest Wyoming. Located 37 miles northwest of the City of Green River, the entire Refuge is within the Green River Basin. Geographically, the Refuge is long and narrow, and bisected throughout its length by the Green River. The north boundary of the Refuge is seven miles downstream from Fontenelle Dam. From there, the Refuge extends 36 miles downstream and ranges in width from one to two miles. Seedskadee NWR was established in 1965 as mitigation for the loss of habitat resulting from the construction of the Flaming Gorge and Fontenelle dams. The riparian corridor is an important migration route and nesting area for a wide variety of migratory waterfowl and passerine bird species. Over 350 species of wildlife utilizes the variety of habitat types, including the river corridor, wetlands and sagebrush uplands, that Seedskadee National Wildlife Refuge support.

Refuge lands are rich in historic and cultural resources because the area was used by nomadic Indian tribes, fur trappers, and early pioneers. Hundreds of thousands of pioneers crossed the treacherous Green River on what is now Seedskadee National Wildlife Refuge. The Oregon and Mormon Trails, which crossed the refuge, have been designated as National Historic Trails by Congress. Jim Bridger and others operated ferries on the Green in the 1840's and 1850's. Diaries of immigrants often mention the crossing on the river and its difficulties. Ferries were swept away by the strong currents and lives and possessions were lost. To this day, some of the trails can be traced across the Refuge by their ruts.

Cokeville Meadows National Wildlife Refuge (CMNWR) south of Cokeville, Wyoming is centered around a 20-mile stretch of the Bear River and its associated wetlands and uplands. The Refuge was established in 1992. While the approved acquisition boundary for the Refuge totals 26,657 acres, only 9,259 have been purchased or are protected through conservation easements to date. Land acquisition is ongoing from willing sellers only.

Wetlands within the acquisition area provide excellent habitat for a variety of migratory and resident wildlife species. The area was identified as the number one priority in the Bear River Focus Area Plan for the Inter-Mountain West Joint Venture. The Refuge supports one of the highest densities of nesting waterfowl in Wyoming, species including White-faced Ibis, Black Tern, and numerous other marsh and shorebirds; provides excellent potential for reintroduction of Trumpeter Swans; and provide habitat for Mule Deer, Elk, and Pronghorn.

Currently Cokeville Meadows is managed as a satellite of Seedskadee National Wildlife Refuge 75 miles to the east. The Refuge remains closed to the public except for the wildlife viewing station located along US Route 30 approximately 10 miles south of the town of Cokeville, WY.

Area Economy

Seedskadee and Cokeville Meadows NWRs are located in southwestern Wyoming. Table 6-31 shows the area economy. The area population increased by 17 percent from 2001 to 2011, compared with a 15 percent increase for Wyoming and a 9 percent increase for the U.S. as a whole. Area employment increased by 20 percent from 2001 to 2011, with Wyoming showing an 18 percent increase and the U.S. a

6 percent increase. Per capita income in the area increased by 25 percent over the 2001-2011 period, while Wyoming and the U.S. increased by 21 and 5 percent respectively.

Table 6-31. Seedskadee and Cokeville Meadows NWRs: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Lincoln WY	18.1	23%	10.1	22%	$37,739	15%
Sweetwater WY	44.2	20%	30.7	26%	$51,860	30%
Uinta WY	21.0	8%	12.6	6%	$41,833	19%
Area Total	**83.2**	**17%**	**53.4**	**20%**	**$46,266**	**25%**
Wyoming	568.2	15%	391.5	18%	$47,898	21%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 6-32 shows the recreation visits for Seedskadee and Cokeville Meadows NWRs. The Refuges had 13,410 visits in 2011. Non-consumptive recreation accounted for 10,800 visits with residents comprising 29 percent of Refuge visitation.

Table 6-32. Seedskadee and Cokeville Meadows NWRs: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	120	180	300
Auto Tour	1,500	3,500	5,000
Boat Trail/Launch	400	400	800
Bicycle	0	0	0
Interpretation	320	2,880	3,200
Photography	150	1,350	1,500
Other Recreation	0	0	0
Hunting:			
Big Game	60	40	100
Small Game	60	40	100
Migratory Birds	246	164	410
Fishing:			
Freshwater	1,000	1,000	2,000
Saltwater	0	0	0
Total Visitation	**3,856**	**9,554**	**13,410**

Regional Economic Analysis

The economic area for the Refuges is Lincoln, Sweetwater, and Uinta Counties in Wyoming. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 6-33. Total expenditures were $498,100 with non-residents accounting for $438,400 or 88 percent of total expenditures. Expenditures on non-consumptive activities accounted for 75 percent of all expenditures.

Table 6-34 summarizes the local economic effects associated with recreation visits. Final demand totaled $613.7 with associated employment of 6 jobs, $177,900 in employment income and $81,800 in total tax revenue.

Table 6-33. Seedskadee and Cokeville Meadows NWRs: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$30.5	$341.3	$371.8
Hunting	$9.1	$29.3	$38.4
Fishing	$20.1	$67.8	$87.9
Total Expenditures	**$59.7**	**$438.4**	**$498.1**

Table 6-34. Seedskadee and Cokeville Meadows NWRs: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$75.2	$538.5	$613.7
Jobs	1	5	6
Job Income	$21.4	$156.5	$177.9
Total Tax Revenue	$10.3	$71.5	$81.8

Table 6-35 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $1.17 means that for every $1 of budget expenditures, $1.17 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 6-35. Seedskadee and Cokeville Meadows NWRs: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Seedskadee and Cokeville Meadows NWRs	$633.7	$498.1	$241.0	$1.17

Tewaukon National Wildlife Refuge

Description

The Tewaukon National Wildlife Refuge Complex (NWRC) is located in the southeast corner of North Dakota and includes the Tewaukon National Wildlife Refuge (NWR) and the Tewaukon Wetland Management District (WMD). The refuge is composed of the Tewaukon and Sprague Lake units (8,363 acres) located in eastern Sargent County while the District is spread over portions of Sargent, Ransom, and Richland Counties. District lands are comprised of both Service owned Waterfowl Production Areas (WPA; 15,966 ac.) and privately owned wetland and grassland easements. The District is located on the gently rolling glacial till plain in the Prairie Pothole Region and the Red River of the North Valley. More than 243 bird species have been recorded in the area it hosts birds from both the Central and Mississippi Flyways. Of these species, 100 are known to nest in the area and the remainder can be seen during spring and fall migrations when peak numbers occur.

The majority of the Tewaukon Complex is located in the tallgrass prairie ecosystem while a portion of western Ransom and Sargent counties lie in the mixed-grass ecosystem. Of all the prairie types, the tallgrass prairie is the most mesic with annual precipitation averaging 20 inches for southeastern North Dakota. The northern tallgrass prairie is characterized by a mixture of warm and cool season grass including big bluestem, Indian grass, switchgrass, prairie cordgrass, green needle grass, and a variety of forbs including golden Alexander, Maximilian sunflower, blazing stars and leadplant. The mixed-grass prairie is characterized by grass and forbs ranging from 2-4 feet tall including needle and thread grass, side oats, blue grama, little bluestem, coneflowers, asters, and golden rods. These plant communities are not separated by distinct boundaries, but instead, transition from tall to mixed grass communities, depending on the cycle of drought and flooding.

The complex has four key wildlife and habitat values: 1) wetlands provide important migration and breeding habitat for several species associated with wetlands including northern leopard frog, painted turtles, mink, and muskrat, 2) tallgrass prairie remnants provide some of the last remaining habitat for nesting and migrating grassland birds, rare prairie butterflies, and other prairie wildlife, 3) other grassland habitat provides winter cover for resident species and breeding habitat for ground nesting birds and other grassland wildlife, 4) riparian habitat that provides breeding and migration areas for many species of birds and mammals. The Tewaukon Complex also provides unique and important values for people. Wildlife, habitat, scenery, recreation, and cultural history all combine to make the Complex a National treasure.

Area Economy

Tewaukon NWR is located in southeastern North Dakota on the border with South Dakota. Table 6-36 shows the area economy. The area population increased by 14 percent from 2001 to 2011, compared with 7 and 9 percent increases respectively for North Dakota and South Dakota, and a 9 percent increase for the U.S. as a whole. Area employment increased by 16 percent from 2001 to 2011, with North Dakota and South Dakota showing 19 and 10 percent increase respectively, and the U.S. a 6 percent increase. Area per capita income increased by 22 percent over the 2001-2011 period, while North Dakota, South Dakota and the U.S. increased by 40, 25 and 5 percent respectively.

Table 6-36. Tewaukon NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Cass ND	152.4	21%	126.3	22%	$45,602	17%
Richland ND	16.2	-8%	10.6	-4%	$46,527	50%
Ransom ND	5.4	-8%	3.6	2%	$45,557	37%
Sargent ND	3.8	-12%	3.4	5%	$57,283	45%
Brown SD	36.8	4%	27.7	5%	$50,274	27%
Area Total	**214.6**	**14%**	**171.6**	**16%**	**$46,679**	**22%**
North Dakota	683.9	7%	527.0	19%	$47,236	40%
South Dakota	824.1	9%	564.4	10%	$44,217	25%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 6-37 shows the recreation visits for Tewaukon NWR. The Refuge had 2,824 visits in 2011. Hunting accounted for 1,670 visits, followed by non-consumptive activities (904 visits) and fishing (250 visits). Residents comprised 74 percent of Refuge visitation.

Table 6-37. Tewaukon NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	162	18	180
Auto Tour	70	70	140
Boat Trail/Launch	190	10	200
Bicycle	4	0	4
Interpretation	80	80	160
Photography	140	60	200
Other Recreation	18	2	20
Hunting:			
Big Game	265	5	270
Small Game	910	490	1,400
Migratory Birds	0	0	0
Fishing:			
Freshwater	238	13	250
Saltwater	0	0	0
Total Visitation	**2,076**	**748**	**2,824**

Regional Economic Analysis

The economic area for the Refuge is Cass, Ranson, Richland and Sargent Counties in North Dakota and Brown County, South Dakota. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 6-38. Total expenditures were $113,800 with non-residents accounting for $69,100 or 61 percent of total expenditures. Expenditures on hunting activities accounted for 74 percent of all expenditures.

Table 6-39 summarizes the local economic effects associated with recreation visits. Final demand totaled $158,600 with associated employment of 2 jobs, $45,300 in employment income and $19,400 in total tax revenue.

Table 6-38. Tewaukon NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$10.6	$11.9	$22.5
Hunting	$28.4	$56.2	$84.6
Fishing	$5.7	$1.0	$6.7
Total Expenditures	**$44.7**	**$69.1**	**$113.8**

Table 6-39. Tewaukon NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$62.2	$96.3	$158.6
Jobs	1	1	2
Job Income	$17.9	$27.4	$45.3
Total Tax Revenue	$7.8	$11.7	$19.4

Table 6-40 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $0.29 means that for every $1 of budget expenditures, $0.29 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 6-40. Tewaukon NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Tewaukon NWR	$739.1	$113.8	$97.5	$0.29

Valentine National Wildlife Refuge

Description

Valentine National Wildlife Refuge (NWR) was established on August 4, 1935 under the Migratory Bird Conservation Act by Executive Order 7142. The purpose of the refuge as stated in the executive order is "as a refuge and breeding ground for migratory birds and other wildlife." Acquisition funding came from Duck Stamp sales and the Emergency Conservation Fund Of 1933.

The 71,772-acre Valentine NWR is located in the Sandhills of north-central Nebraska. The Sandhills contain the largest remaining stands of mid and tall grass native prairie left in North America. The refuge is a unique and ecologically important component of the National Wildlife Refuge System. The refuge has about 49,000 acres of grassy, undulating sand dunes, 13,000 acres of sub-irrigated meadows, and 10,000 acres of shallow lakes and marshes. The refuge is home to 271 species of birds, 59 species of mammals, and 22 species of reptiles and amphibians. The refuge is important to nesting and migrating waterfowl and is also one of the few places where good numbers of sharp-tailed grouse and prairie chickens can be found in the same area. Several threatened or endangered birds stop at the refuge during migration. Two listed plants and one listed insect are also found here. Most of the native flora and fauna found here historically are still present today. About 20,000 people, mostly hunters and fishermen, visit the refuge each year.

The refuge is part of a complex administered from Fort Niobrara NWR. Valentine NWR is in Cherry County with a sub-headquarters located on Pony Lake, 27.5 miles south of the small town of Valentine on US 83 then 1mile east on Pony Lake Road. Valentine National Wildlife Refuge staff also manages the Yellowthroat Wildlife Management Area in Brown County and four easements.

Area Economy

Valentine NWR is located in north central Nebraska. Table 6-41 shows the area economy. The county population decreased by 5 percent from 2001 to 2011, compared with a 7 percent increase for Nebraska, and a 9 percent increase for the U.S. as a whole. County employment increased by 2 percent from 2001 to 2011, with Nebraska showing a 5 percent increase respectively, and the U.S. a 6 percent increase. County per capita income increased by 31 percent over the 2001-2011 period, while Nebraska and the U.S. increased by 12 and 5 percent respectively.

Table 6-41. Valentine NWR:Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Cherry NE	5.8	-5%	4.1	2%	$39,813	31%
Nebraska	1,842.6	7%	1,231.4	5%	$42,450	12%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 6-42 shows the recreation visits for Valentine NWR. The Refuge had 23,375 visits in 2011. Fishing accounted for 20,000 of all recreation visits (86 percent). Residents comprised 15 percent of Refuge visitation.

Table 6-42. Valentine NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	150	850	1,000
Auto Tour	30	170	200
Boat Trail/Launch	0	0	0
Bicycle	0	0	0
Interpretation	0	0	0
Photography	8	43	50
Other Recreation	0	0	0
Hunting:			
Big Game	225	1,275	1,500
Small Game	90	510	600
Migratory Birds	4	21	25
Fishing:			
Freshwater	3,000	17,000	20,000
Saltwater	0	0	0
Total Visitation	**3,506**	**19,869**	**23,375**

Regional Economic Analysis

The economic area for the Refuge is Cherry County, Nebraska. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2011 are shown in Table 6-43. Total expenditures were $2.3 million with non-residents accounting for nearly $2.2 million or 95 percent of total expenditures. Expenditures on fishing activities accounted for 84 percent of all expenditures.

Table 6-44 summarizes the local economic effects associated with recreation visits. Final demand totaled $2.7 million with associated employment of 28 jobs, $780,800 in employment income and $360,300 in total tax revenue.

Table 6-43. Valentine NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$1.1	$27.8	$29.0
Hunting	$10.7	$323.9	$334.5
Fishing	$96.4	$1,844.1	$1,940.5
Total Expenditures	**$108.3**	**$2,195.8**	**$2,304.0**

Table 6-44. Valentine NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$137.5	$2,573.0	$2,710.4
Jobs	2	26	28
Job Income	$40.0	$740.8	$780.8
Total Tax Revenue	$18.9	$341.3	$360.3

Table 6-45 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 6-45. Valentine NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Valentine NWR	NA	$2,304.0	$1,229.3	$3,533.3

Waubay Wetland Mangement District

Description

Waubay National Wildlife Refuge Complex is located in the tallgrass prairie area of northeastern South Dakota.

Waubay Refuge, in the Central Flyway, was established in 1935 to provide a safe place for migrating birds to feed and rest. The Refuge includes 4,650 acres of marsh, prairie, and forest habitat. "Waubay" a Lakota word literally translates to "a nesting place for birds". More than 100 species of birds nest on the Refuge; their abundance fluctuating with the dynamic prairie changes in habitat. A visitor center, trails, and an observation tour are provided for those coming to observe wildlife.

Waubay Wetland Management District (WMD) covers six counties and protects 100,000 acres of wetlands and 150,000 acres of grasslands. In addition 40,000 acres of fee title lands called Waterfowl Production Areas (WPAs) are located here. The first WPA in the nation was purchased in Waubay WMD in 1959. WPAs are managed to provide nesting habitat for waterfowl in this critical Prairie Pothole Region and are open to public hunting.

Area Economy

Table 6-46 shows the area economy for Waubay NWR. The area population increased by 3 percent from 2001 to 2011, compared with a 9 percent increase for South Dakota and a 9 percent increase for the U.S. as a whole. Area employment increased by 7 percent from 2001 to 2011, with South Dakota showing a 10 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 23 percent over the 2001-2011 period, while South Dakota and the U.S. increased by 25 and 5 percent respectively.

Table 6-46. Waubay WMD: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Codington SD	27.4	5%	21.5	10%	$41,322	18%
Day SD	5.7	-6%	3.6	-5%	$45,836	45%
Area Total	**33.2**	**3%**	**25.1**	**7%**	**$42,103**	**23%**
South Dakota	824.1	9%	564.4	10%	$44,217	25%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 6-47 shows the recreation visits for Waubay WMD. Waubay WMD had 62,625 visits in 2011. Hunting accounted for 40,225 visits with residents comprising 44 percent of Refuge visitation.

Table 6-47. Waubay WMD: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	600	2,400	3,000
Auto Tour	1,000	4,000	5,000
Boat Trail/Launch	0	0	0
Bicycle	180	20	200
Interpretation	0	0	0
Photography	350	3,150	3,500
Other Recreation	0	0	0
Hunting:			
Big Game	7,669	2,556	10,225
Small Game	5,400	12,600	18,000
Migratory Birds	3,150	8,850	12,000
Fishing:			
Freshwater	9,095	1,605	10,700
Saltwater	0	0	0
Total Visitation	**27,444**	**35,181**	**62,625**

Regional Economic Analysis

The economic area for the Refuge is Codington and Day Counties in South Dakota. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 6-48. Total expenditures were $2.6 million with non-residents accounting for $2.2 million or 83 percent of total expenditures. Expenditures on hunting activities accounted for 76 percent of all expenditures.

Table 6-49 summarizes the local economic effects associated with recreation visits. Final demand totaled $3.2 million with associated employment of 32 jobs, $945,500 in employment income and $399,600 in total tax revenue.

Table 6-48. Waubay WMD: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$16.3	$373.7	$390.0
Hunting	$266.1	$1,698.3	$1,964.4
Fishing	$146.2	$87.1	$233.2
Total Expenditures	**$428.6**	**$2,159.0**	**$2,587.6**

Table 6-49. Waubay WMD: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$550.1	$2,667.8	$3,218.0
Jobs	6	26	32
Job Income	$160.3	$785.2	$945.5
Total Tax Revenue	$70.8	$328.8	$399.6

Table 6-50 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 6-50. Waubay WMD: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Waubay WMD	NA	$2,587.6	$1,486.2	$4,073.8

Region 7

Region 7 includes Alaska. Sample refuges selected within the region include:

Alaska Peninsula and Becharof NWR
Kenai NWR
Kodiak NWR
Koyukuk/Nowitna NWR Complex
Selawik NWR
Tetlin NWR
Togiak NWR

Alaska Peninsula and Becharof National Wildlife Refuges

Description

Alaska Peninsula and Becharof National Wildlife Refuges, located between the Bering Sea and Pacific Ocean, present a breathtakingly dramatic landscape made up of active volcanoes, towering mountain peaks, rolling tundra, and rugged, wave-battered coastlines.

Becharof Lake, within Becharof National Wildlife Refuge, is the largest freshwater lake in the National Wildlife Refuge System. The lake and its drainage are home to one of the most abundant and significant sockeye salmon runs in Bristol Bay. As is the case with most of Alaska's coastal refuges, salmon provide the principal "nutrient engine" for the Refuges, supporting the species that prey upon them and enriching the rivers and surrounding lands after they spawn and die.

Char, Arctic grayling, bald eagles and brown bear, all predators on salmon, can be found on the Refuges. Other land mammals include wolverine, the caribou of the Northern Alaska Peninsula Herd, wolves, and moose. The latter are relative newcomers, first observed on the peninsula in the early 1900s, and uncommon until the 1950s. The refuge's coastal and offshore waters are home to sea otters, harbor seals, sea lions, and migrating whales.

The Alaska Peninsula and Becharof National Wildlife Refuges encompass over 4.1 million acres of a highly diverse and varied habitats which support both subsistence and recreational activities not found anywhere else in the world.

Area Economy

Alaska Peninsula and Becharof NWRs are located in southwestern Alaska. Table 7-1 shows the area economy. The area population increased by 12 percent from 2001 to 2011, compared with a 14 percent increase for Alaska and a 9 percent increase for the U.S. as a whole. Area employment increased by 12 percent from 2001 to 2011, with Alaska showing a 13 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 9 percent over the 2001-2011 period, while Alaska and the U.S. increased by 11 and 5 percent respectively.

Table 7-1. Alaska Peninsula and Becharof NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
Borough	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Anchorage (Municipality) AK	295.6	12%	202.2	11%	$50,958	9%
Bristol Bay AK	1.0	-14%	2.1	76%	$49,727	6%
Lake and Peninsula AK	1.7	-3%	0.9	-11%	$37,023	17%
Area Total	**298.3**	**12%**	**205.1**	**12%**	**$50,876**	**9%**
Alaska	722.7	14%	454.2	13%	$45,665	11%
U.S.	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 7-2 shows the recreation visits for Alaska Peninsula and Becharof NWR. The Refuge had 8,196 visits in 2011. Non-consumptive recreation accounted for 5,900 visits with residents comprising 59 percent of Refuge visitation. Due to the Refuges remote location, most visitors conduct their recreation in days not hours. Our refuges, in particular Becharof, support millions of salmon that in turn support commercial fishing, the economic mainstay of the region.

Table 7-2. Alaska Peninsula and Becharof NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	1,120	480	1,600
Auto Tour	0	0	0
Boat Trail/Launch	0	0	0
Bicycle	0	0	0
Interpretation	760	40	800
Photography	960	240	1,200
Other Recreation	345	1,955	2,300
Hunting:			
Big Game	280	70	350
Small Game	46	0	46
Migratory Birds	48	0	48
Fishing:			
Freshwater	1,296	556	1,852
Saltwater	0	0	0
Total Visitation	**4,855**	**3,341**	**8,196**

Regional Economic Analysis

The economic area for the Refuge is Anchorage, Bristol Bay, and Lake and Peninsula in Alaska. It is assumed that visitor expenditures occur primarily within this study area. Visitor recreation expenditures for 2011 are shown in Table 7-3. Total expenditures were $1.2 million with non-residents accounting for $1.0 million or 82 percent of total expenditures. Expenditures on non-consumptive activities accounted for 69 percent of all expenditures.

Table 7-4 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.6 million with associated employment of 12 jobs, $486,900 in employment income and $221,200 in total tax revenue.

Table 7-3. Alaska Peninsula and Becharof NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$126.1	$730.3	$856.4
Hunting	$21.9	$32.0	$53.9
Fishing	$75.9	$254.0	$329.9
Total Expenditures	**$224.0**	**$1,016.3**	**$1,240.2**

Table 7-4. Alaska Peninsula and Becharof NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$348.1	$1,265.5	$1,613.7
Jobs	2	9	12
Job Income	$106.5	$380.4	$486.9
Total Tax Revenue	$49.9	$171.3	$221.2

Table 7-5 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $0.71 means that for every $1 of budget expenditures, $0.71 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 7-5. Alaska Peninsula and Becharof NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Alaska Peninsula and Becharof NWR	$2,203.6	$1,240.2	$319.0	$0.71

Kenai National Wildlife Refuge

Description

Alaska's Kenai Peninsula is, in geologic terms, still quite "young," since its entire land mass was covered by glacial ice as recently as 10,000 years ago. Much of that frozen blanket still exists today, in the form of the more than 800-square mile Harding Ice Field, which the Refuge "shares" with Kenai Fjords National Park.

The grudging withdrawal of the Harding Ice Field has helped to make the lands of the Kenai National Wildlife Refuge an “Alaska in miniature. “ Today, the Refuge includes examples of every major Alaska habitat type which results in a notably high diversity of wildlife. Sportfish bring hundreds of thousands of visitors to the peninsula each year. Eager anglers can pursue chinook, sockeye, coho and pink salmon; as well as Dolly Varden char, rainbow trout, and arctic grayling. The Refuge is also home to brown and black bears, caribou, Dall sheep, mountain goats, wolves, lynx, wolverines, eagles and thousands of shorebirds and waterfowl, not to mention the mighty Alaska-Yukon moose that the refuge was originally established (as the Kenai National Moose Range) to protect.

Today the Kenai National Wildlife Refuge's wealth of habitat, scenery and fish and wildlife resources draws over half a million visitors per year, more than any other wildlife refuge in Alaska.

Area Economy

Kenai NWR is located in south central Alaska. Table 7-6 shows the area economy. The area population increased by 13 percent from 2001 to 2011, compared with a 14 percent increase for Alaska and a 9 percent increase for the U.S. as a whole. Area employment increased by 10 percent from 2001 to 2011, with Alaska showing a 13 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 11 percent over the 2001-2011 period, while Alaska and the U.S. increased by 11 and 5 percent respectively.

Table 7-6. Kenai NWR: Summary of Area Economy, 2011
(Population & Employment in 000’s; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
Borough	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Kenai Peninsula AK	56.3	13%	31.3	10%	$41,772	11%
Alaska	722.7	14%	454.2	13%	$45,665	11%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 7-7 shows the recreation visits for Kenai NWR. The Refuge had 572,584 visits in 2011. Non-consumptive recreation accounted for 305,402 visits with residents comprising 62 percent of Refuge visitation.

Table 7-7. Kenai NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	97,306	41,702	139,008
Auto Tour	0	0	0
Boat Trail/Launch	7,494	7,494	14,987
Bicycle	390	21	410
Interpretation	513	513	1,025
Photography	32,716	21,810	54,526
Other Recreation	47,723	47,723	95,446
Hunting:			
Big Game	7,008	1,237	8,245
Small Game	4,457	786	5,243
Migratory Birds	7,172	377	7,549
Fishing:			
Freshwater	147,687	98,458	246,145
Saltwater	0	0	0
Total Visitation	**352,463**	**220,121**	**572,584**

Regional Economic Analysis

The economic area for the Refuge is Kenai Peninsula Borough Alaska. It is assumed that visitor expenditures occur primarily within this borough. Visitor recreation expenditures for 2011 are shown in Table 7-8. Total expenditures were $83.7 million with non-residents accounting for $69.3 million or 83 percent of total expenditures. Expenditures on fishing activities accounted for 64 percent of all expenditures, followed by non-consumptive activities (34 percent) and hunting activities (2 percent).

Table 7-9 summarizes the local economic effects associated with recreation visits. Final demand totaled $112.7 million with associated employment of 907jobs, $32.4 million in employment income and $15.2 million in total tax revenue.

Table 7-8. Kenai NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$4,959.7	$23,457.6	$28,417.3
Hunting	$751.2	$831.4	$1,582.6
Fishing	$8,652.0	$45,009.0	$53,661.0
Total Expenditures	**$14,362.8**	**$69,298.0**	**$83,660.9**

Table 7-9. Kenai NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$18,228.5	$94,526.3	$112,754.8
Jobs	148	759	907
Job Income	$5,448.1	$26,958.8	$32,406.9
Total Tax Revenue	$2,719.6	$12,464.6	$15,184.2

Table 7-10 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $27.10 means that for every $1 of budget expenditures, $27.10 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from Refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 7-10. Kenai NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Kenai NWR	$3,883.7	$83,660.9	$21,570.4	$27.10

Kodiak National Wildlife Refuge

Description

Kodiak is a rugged, beautiful island on the coast of southwestern Alaska. Established in 1941, the refuge provides habitat for brown bear, salmon and other wildlife. Kodiak's scenery is magnificent- rugged mountains, hundreds of miles of shoreline, lakes, marshes, bogs, and meadows. Four-thousand-foot mountains rise from the sea accented with fjord like inlets. Lush vegetation blankets the mountains ranging from sedges, alders, and spruce to colorful wildflowers and berries.

The 1.9 million-acre Kodiak National Wildlife Refuge roughly encompasses the southwestern two-thirds of Kodiak Island, Uganik Island, the Red Peaks area on northwestern Afognak Island, and all of Ban Island. No place on the refuge is more than 15 miles from the Pacific Ocean. Without roads, the refuge provides a wilderness setting for fish, wildlife, and humans alike.

The refuge is home to an estimated 2,300 brown bears, and at least 600 nesting pairs of bald eagles. More than 250 species of birds live upon or visit the refuge, while more than 1.5 million seabirds overwinter in nearshore waters surrounding Kodiak Island.

The refuge also provides spawning and rearing habitat for all five North American species of Pacific salmon. Salmon produced on the refuge make up approximately 65 percent of the total commercial harvest in the Kodiak Archipelago.

Area Economy

Table 7-11 shows the area economy for Kodiak NWR. The area population increased by 11 percent from 2001 to 2011, compared with a 14 percent increase for Alaska and a 9 percent increase for the U.S. as a whole. Area employment increased by 11 percent from 2001 to 2011, with Alaska showing a 13 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 9 percent over the 2001-2011 period, while Alaska and the U.S. increased by 11 and 5 percent respectively.

Table 7-11. Kodiak NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
Borough	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Anchorage (Municipality) AK	295.6	12%	202.2	11%	$50,958	9%
Kodiak Island (Borough) AK	13.9	1%	10.1	7%	$43,951	25%
Area Total	**309.4**	**11%**	**212.3**	**11%**	**$50,644**	**9%**
Alaska	722.7	14%	454.2	13%	$45,665	11%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 7-12 shows the recreation visits for Kodiak NWR. The Refuge had 50,855 visits in 2011. Non-consumptive recreation accounted for 47,795 visits with residents comprising 34 percent of Refuge visitation.

Table 7-12. Kodiak NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	900	900	1,800
Auto Tour	0	0	0
Boat Trail/Launch	0	0	0
Bicycle	0	0	0
Interpretation	14,598	21,897	36,495
Photography	400	3,600	4,000
Other Recreation	250	250	500
Hunting:			
Big Game	550	4,950	5,500
Small Game	157	3	160
Migratory Birds	475	25	500
Fishing:			
Freshwater	190	1,710	1,900
Saltwater	0	0	0
Total Visitation	**17,520**	**33,335**	**50,855**

Regional Economic Analysis

The economic area for the Refuge is the Anchorage municipality and Kodiak Island Borough in Alaska. It is assumed that visitor expenditures occur primarily within this study area. Visitor recreation expenditures for 2011 are shown in Table 7-13. Total expenditures were over $6.1 million with non-residents accounting for $5.9 million or 95 percent of total expenditures. Expenditures on non-consumptive activities accounted for 62 percent of all expenditures.

Table 7-14 summarizes the local economic effects associated with recreation visits. Final demand totaled $9.7 million with associated employment of 65 jobs, $2.9 million in employment income and $1.3 million in total tax revenue.

Table 7-13. Kodiak NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$257.4	$3,573.9	$3,831.3
Hunting	$50.7	$1,705.7	$1,756.5
Fishing	$8.3	$586.3	$594.6
Total Expenditures	**$316.5**	**$5,865.9**	**$6,182.4**

Table 7-14. Kodiak NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$491.3	$9,204.7	$9,696.0
Jobs	3	61	65
Job Income	$150.3	$2,783.9	$2,934.3
Total Tax Revenue	$70.5	$1,216.4	$1,286.8

Table 7-15 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $3.24 means that for every $1 of budget expenditures, $3.24 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 7-15. Kodiak NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Kodiak NWR	$2,201.8	$6,182.4	$956.0	$3.24

Koyukuk/Nowitna National Wildlife Refuge Complex

Description

The 3.5 million-acre Koyukuk National Wildlife Refuge lies within the floodplain of the Koyukuk River, in a basin that extends from the Yukon River to the Purcell Mountains and the foothills of the Brooks Range. This region of wetlands and low rolling uplands is home to an abundance of fish, waterfowl and songbirds, beaver, snowshoe hares and voles, moose and caribou, bears, wolves, lynx and marten.

In the Koyukuk's wetlands, breeding waterfowl feast upon water plants and abundant protein-rich invertebrates. Young birds grow quickly in the short, lush summer, and prepare for the fall migration. As many as 100,000 ducks are hatched and raised on Refuge lands during a single nesting season. Migratory songbirds and raptors also depend on the rich resources of the Koyukuk Refuge for breeding and raising young.

Koyukuk Refuge's Three-Day Slough area, part of the 400,000 acre Koyukuk Wilderness, has some of the most productive moose habitat in Alaska. The Wilderness Area also encompasses the Nogahabara Sand Dune field, home to several rare plant and insect species. Caribou from the migratory Western Arctic Herd, which numbers more than 450,000, often move into the northernmost reaches of the Refuge in winter months in search of lichens that lie beneath the snow. The Koyukuk also supports a resident non-migratory caribou population, the Galena Mountain Herd, which numbers about 300. Wolves, lynx and other furbearers, as well as black and grizzly bears, are found on the Refuge year around.

The heart of Nowitna National Wildlife Refuge is a lowland basin of forests and wetlands that forms the floodplain of the meandering Nowitna River. The Refuge's climate is typically marked by light precipitation, mild winds, long, hard winters and short, relatively warm, summers. The hills that circle the refuge lowlands are capped by alpine tundra.

It takes a week in a canoe, or more than an hour in a small plane, to traverse the Nowitna Refuge's 2.1 million acres of pristine wildlife habitat. Approximately 223 miles of the Nowitna River's 283-mile length flow within the boundaries of the Refuge. Fish species inhabiting the river and its related lakes and streams include sheefish, burbot, whitefish, sucker, king and chum salmon, northern pike and arctic grayling.

The slow, meandering lower reaches of the Nowitna wander through another of Alaska's productive waterfowl nurseries. The grassy margins of the river, surrounding lakes, and waterways provide breeding habitat for trumpeter swans, white-fronted geese, canvasback ducks, cranes, and many other migratory species. More than 120 bird species have been sighted on the Refuge during summer months, but only a few dozen hardy species remain through winters.

Forested uplands of the Nowitna Refuge are important habitat for marten and their small mammal prey, lynx, bears, and wolves. The refuge has been a traditional trapping area for area residents for centuries.

Area Economy

Koyukuk/Nowitna NWR is located in the western interior region of Alaska. There are eight rural villages within or near the refuge: Galena, Huslia, Hughes, Koyukuk, Nulato, Kaltag, Ruby, and Tanana. Galena serves as the area hub, with Fairbanks serving as the nearest larger city. Most travel between these communities is done by commercial air carriers, personal boats or snow machine.

Table 7-16 shows the area economy. The area population increased by 15 percent from 2001 to 2011, compared with a 14 percent increase for Alaska and a 9 percent increase for the U.S. as a whole. Area employment increased by 11 percent from 2001 to 2011, with Alaska showing a 13 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 19 percent over the 2001-2011 period, while Alaska and the U.S. increased by 11 and 5 percent respectively.

Table 7-16. Koyukuk/Nowitna NWR Complex: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
Borough	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Yukon-Koyukuk	99.2	17%	59.0	12%	$42,626	17%
Fairbanks North Star	5.7	-11%	3.3	1%	$37,259	36%
Area Total	**104.8**	**15%**	**62.4**	**11%**	**$42,336**	**19%**
Alaska	722.7	14%	454.2	13%	$45,665	11%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 7-17 shows the recreation visits for Koyukuk/Nowitna NWR Complex. The Refuge had 11,623 visits in 2011. Non-consumptive recreation accounted for 6,438 visits with residents comprising 93 percent of Refuge visitation.

Table 7-17. Koyukuk/Nowitna NWR Complex: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	10	0	10
Auto Tour	0	0	0
Boat Trail/Launch	1,710	90	1,800
Bicycle	0	0	0
Interpretation	223	5	228
Photography	488	163	650
Other Recreation	3,713	38	3,750
Hunting:			
Big Game	2,678	473	3,150
Small Game	67	4	70
Migratory Birds	565	0	565
Fishing:			
Freshwater	1,330	70	1,400
Saltwater	0	0	0
Total Visitation	**10,782**	**841**	**11,623**

Regional Economic Analysis

The economic area for the Refuge is Yukon/Koyukuk and Fairbanks North Star areas in Alaska. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 7-18. Total expenditures were $858,600 with non-residents accounting for $354,700 or 41 percent of total expenditures. Expenditures on hunting activities accounted for 48 percent of all expenditures, followed by non-consumptive activities (40 percent) and fishing activities (12 percent).

Table 7-19 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.1 million with associated employment of 8 jobs, $330,600 in employment income and $146,500 in total tax revenue.

Table 7-18. Koyukuk/Nowitna NWR Complex: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$234.1	$105.9	$340.0
Hunting	$191.9	$216.8	$408.7
Fishing	$77.9	$32.0	$109.9
Total Expenditures	**$503.9**	**$354.7**	**$858.6**

Table 7-19. Koyukuk/Nowitna NWR Complex: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$622.1	$456.0	$1,078.1
Jobs	5	3	8
Job Income	$193.7	$136.9	$330.6
Total Tax Revenue	$88.7	$57.8	$146.5

Table 7-20 shows total economic effects (total recreation expenditures plus net economic value) for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures to estimate total economic effects. A ratio comparing economic effects and the Refuge's budget is unavailable because the Refuge is part of a Complex.

Table 7-20. Koyukuk/Nowitna NWR Complex: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects
Koyukuk/Nowitna NWR Complex	NA	$858.6	$503.0	$1,361.6

Selawik National Wildlife Refuge

Description

It could be argued that Selawik National Wildlife Refuge contains some of the most historically significant acreage in North America. The refuge once formed part of the American portion of the vast Bering Land Bridge that, some scientists speculate, was the route followed by the ancestors of many of today's large mammals, as well as early humans, when traveling between Asia and the Americas some 12,000 years ago. Today the refuge remains the homeland of the indigenous Iñupiat who continue to hunt, fish, and gather plants and berries on refuge lands as they have for thousands of years.

The refuge is home to a variety of wildlife. More than 300,000 caribou from the Western Arctic Caribou Herd, the largest in Alaska, travel through the refuge in spring and fall. Portions of the herd sometimes winter in the area. Moose, brown bear, wolverine and other furbearers are present year-round. Selawik's approximately 24,000 lakes and wetlands also serve as breeding or stop-over resting places for hundreds of thousands of migratory birds, some arriving from as far away as Australia. And, in addition to the sheefish that gave the refuge its name, whitefish, arctic grayling and northern pike are present in Selawik's waters.

Area Economy

Selawik NWR is located in northwestern Alaska. Table 7-21 shows the area economy. The area population increased by 13 percent from 2001 to 2011, compared with a 14 percent increase for Alaska and a 9 percent increase for the U.S. as a whole. Area employment increased by 11 percent from 2001 to 2011, with Alaska showing a 13 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 10 percent over the 2001-2011 period, while Alaska and the U.S. increased by 11 and 5 percent respectively.

Table 7-21. Selawik NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
Borough	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Anchorage (Municipality) AK	295.6	12%	202.2	11%	$50,958	9%
Fairbanks North Star AK	99.2	17%	59.0	12%	$42,626	17%
Northwest Arctic AK	7.7	7%	3.6	8%	$34,720	11%
Area Total	**402.5**	**13%**	**264.8**	**11%**	**$48,593**	**10%**
Alaska	722.7	14%	454.2	13%	$45,665	11%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 7-22 shows the recreation visits for Selawik NWR. The Refuge had 21,203 visits in 2011. Non-consumptive recreation accounted for 7,803 visits with residents comprising 94percent of Refuge visitation.

Table 7-22. Selawik NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	0	0	0
Auto Tour	0	0	0
Boat Trail/Launch	2,822	58	2,880
Bicycle	0	0	0
Interpretation	273	30	303
Photography	5	5	10
Other Recreation	4,149	461	4,610
Hunting:			
Big Game	3,240	360	3,600
Small Game	711	15	725
Migratory Birds	763	13	775
Fishing:			
Freshwater	7,885	415	8,300
Saltwater	0	0	0
Total Visitation	**19,847**	**1,356**	**21,203**

Regional Economic Analysis

The economic area for the Refuge is Anchorage, and the Fairbanks North Star and Northwest Arctic Boroughs in Alaska. It is assumed that visitor expenditures occur primarily within these areas. Visitor recreation expenditures for 2011 are shown in Table 7-23. Total expenditures were $901,600 with non-residents accounting for $325,200 or 36 percent of total expenditures. Expenditures on non-consumptive and hunting activities each accounted for about 36 percent of all expenditures.

Table 7-24 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.4 million with associated employment of 9 jobs, $419,500 in employment income and $190,300 in total tax revenue.

Table 7-23. Selawik NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$208.3	$123.1	$331.5
Hunting	$194.9	$130.9	$325.8
Fishing	$173.2	$71.1	$244.4
Total Expenditures	**$576.4**	**$325.2**	**$901.6**

Table 7-24. Selawik NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$896.7	$511.9	$1,408.5
Jobs	6	3	9
Job Income	$267.6	$151.9	$419.5
Total Tax Revenue	$124.5	$65.8	$190.3

Table 7-25 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $1.28 means that for every $1 of budget expenditures, $1.28 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 7-25. Selawik NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Selawik NWR	$1,150.7	$901.6	$571.5	$1.28

Tetlin National Wildlife Refuge

Description

Tetlin National Wildlife Refuge is a dynamic landscape made up of forests, wetlands, tundra, lakes, mountains and glacial rivers bounded by the snowy peaks of the Alaska Range. This upper Tanana River valley has been called the "Tetlin Passage," because it serves as a major migratory route for birds traveling to and from Canada, the lower 48 and both Central and South America. Many of these birds breed and nest on the refuge. Others pass through on their way to breeding and nesting grounds elsewhere in the state. Migrants, including ducks, geese, swans, cranes, raptors and songbirds, begin arriving in the valley in April, and continue into early June. An estimated 116 species breed on Tetlin during the short summer, when long days and warm temperatures accelerate the growth of plants, insects and other invertebrates, providing a ready source of rich foods for nesting birds.

Tetlin Refuge also supports a variety of large mammals. Dall sheep dot the higher slopes while moose feed upon the tender new growth that springs up in the wake of frequent lightning caused fires. Wolves, grizzly and black bears and members of three different caribou herds range over the refuge. Two of the six known humpback whitefish spawning areas in the Yukon River drainage are located within the refuge. Along with caribou and moose, these fish are important subsistence resources for area residents. Arctic grayling, northern pike and burbot are also found in the refuge's many streams and lakes.

Area Economy

Tetlin NWR is located in southeastern Alaska. Table 7-26 shows the area economy. The area population increased by 11 percent from 2001 to 2011, compared with a 14 percent increase for Alaska and a 9 percent increase for the U.S. as a whole. Area employment increased by 11 percent from 2001 to 2011, with Alaska showing a 13 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 9 percent over the 2001-2011 period, while Alaska and the U.S. increased by 11 and 5 percent respectively.

Table 7-26. Tetlin NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
Borough	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Valdez-Cordova (Census Area) AK	9.8	-3%	7.3	3%	$45,289	12%
Anchorage (Municipality) AK	295.6	12%	202.2	11%	$50,958	9%
Area Total	**305.3**	**11%**	**209.4**	**11%**	**$50,777**	**9%**
Alaska	722.7	14%	454.2	13%	$45,665	11%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 7-27 shows the recreation visits for Tetlin NWR. The Refuge had 90,624 visits in 2011. Non-consumptive recreation accounted for 86,403 visits with residents comprising 53 percent of Refuge visitation.

The number of visits in 2011 is higher than past years past due to more opportunities being available to visitors on the refuge, more accurate estimations, and better methods of counting visitors. Visits in 2011 for some activities however was slightly down due to a wet, cool summer.

Table 7-27. Tetlin NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	4,384	5,146	9,530
Auto Tour	2,594	23,342	25,936
Boat Trail/Launch	2,785	147	2,932
Bicycle	0	200	200
Interpretation	74	1,401	1,475
Photography	30,376	3,375	33,751
Other Recreation	3,774	8,805	12,579
Hunting:			
Big Game	587	6	593
Small Game	1,477	0	1,477
Migratory Birds	936	0	936
Fishing:			
Freshwater	1,215	0	1,215
Saltwater	0	0	0
Total Visitation	**48,201**	**42,423**	**90,624**

Regional Economic Analysis

The economic area for the Refuge is Valdez-Cordova and Anchorage, Alaska. It is assumed that visitor expenditures occur primarily within these areas. Visitor recreation expenditures for 2011 are shown in Table 7-28. Total expenditures were $6.3 million with non-residents accounting for $5.5 million or 88 percent of total expenditures. Expenditures on non-consumptive activities accounted for 97 percent of all expenditures.

Table 7-29 summarizes the local economic effects associated with recreation visits. Final demand totaled $10.0 million with associated employment of 66 jobs, $3.0 million in employment income and $1.3 million in total tax revenue. Seasonal tourism (June-August) is the primary economic activity on the Refuge for the community of Tok.

Table 7-28. Tetlin NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$567.3	$5,485.8	$6,053.1
Hunting	$140.4	$2.7	$143.1
Fishing	$71.2	$0.0	$71.2
Total Expenditures	**$778.9**	**$5,488.5**	**$6,267.4**

Table 7-29. Tetlin NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$1,223.2	$8,750.7	$9,973.8
Jobs	8	58	66
Job Income	$370.7	$2,628.8	$2,999.5
Total Tax Revenue	$173.6	$1,149.6	$1,323.2

Table 7-30 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $5.00 means that for every $1 of budget expenditures, $5.00 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 7-30. Tetlin NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Tetlin NWR	$1,512.6	$6,267.4	$1,300.5	$5.00

Togiak National Wildlife Refuge

Description

Dominated by the Ahklun Mountains in the north and the cold waters of Bristol Bay to the south, Togiak National Wildlife Refuge confronts the traveler with a kaleidoscope of landscapes. The natural forces that have shaped this land range from the violent and powerful to the geologically patient. Earthquakes and volcanoes filled the former role, and their marks can still be found, but it was the gradual advance and retreat of glacial ice that carved many of the physical features of this refuge.

The refuge is home to 48 mammal species, 31 of which are terrestrial and 17 marine. More than 150,000 caribou from two herds, the Nushagak Peninsula and the Mulchatna, make use of refuge lands, which they share with wolves, moose, brown and black bears, wolverines, red foxes, marmots, beavers, and porcupines, among other land mammals. Seals, sea lions, walrus and whales are found at various times of year along the refuge's 600 miles of coastline.

Some 201 species of birds have been sighted on Togiak Refuge. Threatened species can occasionally be found here, including Steller's and spectacled eiders. Several arctic goose species frequent the refuge, along with murres, peregrine falcons, dowitchers, Lapland longspurs and a rich variety of other seabirds, waterfowl, shorebirds, songbirds and raptors. Refuge staff and volunteers have also documented more than 500 species of plants, demonstrating a high degree of biodiversity for a sub-arctic area.

Area Economy

Togiak NWR is located within the Dillingham and Bethel Cenus Areas within the Unincorporated Borough in Alaska. The Municipality of Anchorage is included in the area economy because the city is a transportation hub for western Alaska. Table 7-31 shows the area economy. The area population increased by 11 percent from 2001 to 2011, compared with a 14 percent increase for Alaska and a 9 percent increase for the U.S. as a whole. Area employment increased by 11 percent from 2001 to 2011, with Alaska showing a 13 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 9 percent over the 2001-2011 period, while Alaska and the U.S. increased by 11 and 5 percent respectively.

Table 7-31. Togiak NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
Borough	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Anchorage (Municipality) AK	295.6	12%	202.2	11%	$50,958	9%
Bethel (Census Area) AK	17.4	8%	8.9	9%	$32,108	16%
Dillingham (Census Area) AK	5.0	3%	4.2	6%	$40,046	15%
Area Total	**318.0**	**11%**	**215.2**	**11%**	**$49,755**	**9%**
Alaska	722.7	14%	454.2	13%	$45,665	11%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 7-32 shows the recreation visits for Togiak NWR. The Refuge had 32,827 visits in 2011. Fishing activities accounted for 17,518 visits with half of the fishing trip to the refuge lasting 7 to 9 days and the other half lasting 1 to 3 days. Alaska residents comprised 31 percent of Refuge visitation.

The sport fishing industry attracts clients from throughout the US and some foreign countries. Much of the visitor use reported under Freshwater Fishing includes clients with permitted guides. The refuge has 25 competitively awarded permits in place for sport fishing services and we issue 5 to 7 air taxi permits each year that mainly transport fishing and hunting clients (for both the guided groups and non-guided groups). Three permitted big game guides take approximately 15 clients per year (total) to the refuge for brown bear hunting. One permitted bird hunting guide takes approximately 8 clients per year (total) to the refuge for waterfowl hunting, and in most years 1 to 2 permitted eco-touring companies take approximately 10 clients per year to view wildlife.

Table 7-32. Togiak NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	0	0	0
Auto Tour	0	0	0
Boat Trail/Launch	0	0	0
Bicycle	0	0	0
Interpretation	195	195	390
Photography	3,864	5,796	9,660
Other Recreation	1,700	1,700	3,400
Hunting:			
Big Game	330	770	1,100
Small Game	233	26	259
Migratory Birds	450	50	500
Fishing:			
Freshwater	3,504	14,014	17,518
Saltwater	0	0	0
Total Visitation	**10,276**	**22,551**	**32,827**

Regional Economic Analysis

The economic area for the Refuge is Anchorage, Bethel, and Dillingham in Alaska. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 7-33. Total expenditures were $9.1 million with non-residents accounting for $8.7 million or 95 percent of total expenditures. Expenditures on fishing activities accounted for 72 percent of all expenditures, followed by non-consumptive activities (23 percent) and hunting activities (5 percent).

Table 7-34 summarizes the local economic effects associated with recreation visits. Final demand totaled $14.3 million with associated employment of 95 jobs, $4.3 million in employment income and $1.9 million in total tax revenue.

Table 7-33. Togiak NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$190.7	$1,929.9	$2,120.7
Hunting	$41.0	$370.8	$411.8
Fishing	$205.3	$6,406.5	$6,611.8
Total Expenditures	**$437.0**	**$8,707.2**	**$9,144.2**

Table 7-34. Togiak NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$675.6	$13,579.7	$14,255.3
Jobs	5	91	95
Job Income	$206.2	$4,089.2	$4,295.4
Total Tax Revenue	$96.6	$1,783.7	$1,880.3

Table 7-35 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $5.15 means that for every $1 of budget expenditures, $5.15 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 7-35. Togiak NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Togiak NWR	$2,056.3	$9,144.2	$1,450.1	$5.15

Region 8

California-Nevada Operations includes California and Nevada. Sample refuges selected within the region include:

Sacramento NWR (California)
San Luis NWR (California)
Sony Bono Salton Sea NWR (California)
Stillwater NWR (Nevada)

Sacramento National Wildlife Refuge

Description

The Sacramento National Wildlife Refuge is the headquarters for the Sacramento National Wildlife Refuge Complex and is one of five refuges in the Complex. The Complex is located in the Sacramento Valley of north-central California, which is approximately 90 miles north of Sacramento.

The -acre refuge consists of uplands, riparian habitat, vernal pools and about 7,600 acres of managed wetlands. It typically supports wintering populations of more than 600,000 ducks and 200,000 geese. More than 95 percent of the wetlands of the central valley have been lost in the last 100 years, and waterfowl have become increasingly dependent upon the refuges of the Sacramento Valley.

The refuge supports several endangered plants and animals, including transplanted colonies of palmate-bracted bird's-beak, several species of fairy shrimp, vernal pool tadpole shrimp, giant garter snake, wintering peregrine falcon, bald eagle, and tricolored blackbird. Resident wildlife includes grebe, heron, blackbird, golden eagle, beaver, muskrat, black-tailed deer, and other species typical of upland and wetland habitats.

Area Economy

Sacramento NWR is located in north central California. Table 8-1 shows the area economy. The area population increased by 8 percent from 2001 to 2011, compared with a 9 percent increase for California and a 9 percent increase for the U.S. as a whole. Area employment decreased by 1 percent from 2001 to 2011, with California showing a 2 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 13 percent over the 2001-2011 period, while California and the U.S. increased by 1 and 5 percent respectively.

Table 8-1. Sacramento NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Butte CA	220.3	7%	99.7	-1%	$33,356	9%
Colusa CA	21.5	13%	11.3	15%	$46,741	42%
Glenn CA	28.1	6%	11.8	1%	$36,796	36%
Tehama CA	63.6	12%	22.5	-6%	$27,592	6%
Area Total	**333.5**	**8%**	**145.3**	**-1%**	**$33,412**	**13%**
California	37,691.9	9%	19,969.3	2%	$43,647	1%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 8-2 shows the recreation visits for Sacramento NWR. The Refuge had 71,514 visits in 2011. Non-consumptive recreation accounted for 63,727 visits with residents comprising 18 percent of Refuge visitation.

Table 8-2. Sacramento NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	854	5,712	6,566
Auto Tour	6,788	45,424	52,212
Boat Trail/Launch	0	0	0
Bicycle	2	0	2
Interpretation	2,086	2,171	4,257
Photography	90	600	690
Other Recreation	0	0	0
Hunting:			
Big Game	0	0	0
Small Game	157	217	374
Migratory Birds	3,113	4,300	7,413
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	**13,089**	**58,425**	**71,514**

Regional Economic Analysis

The economic area for the Refuge is Butte, Colusa, Glenn, and Tehama Counties in California. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 8-3. Total expenditures were $2.5 million with non-residents accounting for $2.2 million or 90 percent of total expenditures. Expenditures on non-consumptive activities accounted for 75 percent of all expenditures.

Table 8-4 summarizes the local economic effects associated with recreation visits. Final demand totaled $3.8 million with associated employment of 28 jobs, $1.1 million in employment income and $510,900 in total tax revenue.

Table 8-3. Sacramento NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$120.8	$1,732.8	$1,853.6
Hunting	$127.9	$476.0	$603.9
Fishing	$0.0	$0.0	$0.0
Total Expenditures	**$248.8**	**$2,208.7**	**$2,457.5**

Table 8-4. Sacramento NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$386.3	$3,460.1	$3,846.5
Jobs	3	25	28
Job Income	$117.7	$1,015.1	$1,132.8
Total Tax Revenue	$56.6	$454.3	$510.9

Table 8-5 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $1.01 means that for every $1 of budget expenditures, $1.01 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 8-5. Sacramento NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Sacramento NWR	$3,618.7	$2,457.5	$1,183.2	$1.01

San Luis National Wildlife Refuge

Description

The San Luis National Wildlife Refuge – located in the northern San Joaquin Valley of California in Merced County – encompasses over 26,800 acres of wetlands, riparian forests, native grasslands, and vernal pools. A thriving population of the endemic tule elk is showcased by one of three auto tour routes. The Refuge is host to significant assemblages of birds, mammals, reptiles, amphibians, fish, insects, and plants; some of which, such as the California tiger salamander, the long-horned fairy shrimp, and San Joaquin kit fox, are endangered species.

The Refuge is a major wintering ground and migratory stopover point for large concentrations of waterfowl, shorebirds, and other waterbirds. Large flocks of green-winged teal, northern shoveler, mallard, gadwall, wigeon, cinnamon teal, northern pintail, ring-necked duck, canvasback, ruddy duck, and snow, Ross', and white-fronted geese swarm over the mosaic of seasonal and permanent wetlands that comprise a quarter of the Refuge. Waterfowl generally remain until late March before beginning their journey north to breeding areas. Thousands upon thousands of waterfowl use this Refuge from September through March.

Shorebirds including sandpipers and plovers can be found in the tens of thousands from autumn through spring. Large flocks of dunlin, long-billed dowitchers, least sandpipers, and western sandpipers can be seen feeding in shallow seasonal wetlands, whereas flocks of long-billed curlews are found using both wetlands and grasslands. More than 25 species of shorebirds have been documented at the San Luis NWR.

The San Luis NWR provides visitors a variety of ways to observe and experience the diverse assortment of wildlife. A visitor center, opened in fall 2011 is a focal point of visitation and features and interactive exhibit hall and environmental education room to conduct school visits. Auto tour routes allow visitors to remain in their vehicles, using them as a "blind" while observing wildlife throughout various habitats. Auto tour routes and nature trails also include elevated observation decks with spotting scopes that allow even closer views of wildlife, and interpretive panels that provide information about wildlife, habitats, and refuge management to further enhance visitors' experiences.

Area Economy

San Luis NWR is located in north central California. Table 8-6 shows the area economy. The area population increased by 10 percent from 2001 to 2011, compared with a 9 percent increase for California and a 9 percent increase for the U.S. as a whole. Area employment decreased by 3 percent from 2001 to 2011, with California showing a 2 percent increase and the U.S. a 6 percent increase. Per capita income in the area decreased by 2 percent over the 2001-2011 period, while California and the U.S. increased by 1 and 5 percent respectively.

Table 8-6. San Luis NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		Employment		Per Capita Income	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Alameda, CA	1,529.9	4%	862.8	-4%	$49,617	0%
Fresno, CA	942.9	16%	429.0	6%	$31,542	2%
Madera, CA	152.9	22%	56.7	10%	$28,631	12%
Merced, CA	259.9	19%	90.4	8%	$28,497	6%
San Joaquin, CA	696.2	18%	269.1	2%	$31,013	-4%
Santa Clara, CA	1,809.4	7%	1,144.2	-7%	$61,833	-2%
Stanislaus, CA	518.5	12%	209.1	0%	$32,115	2%
Area Total	**5,909.7**	**10%**	**3,061.1**	**-3%**	**$45,274**	**-2%**
California	37,691.9	9%	19,969.3	2%	$43,647	1%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 8-7 shows the recreation visits for San Luis NWR. The Refuge had 92,225 visits in 2011. Non-consumptive recreation accounted for 78,450 visits with residents comprising 58 percent of Refuge visitation.

Table 8-7. San Luis NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	2,200	1,800	4,000
Auto Tour	39,600	32,400	72,000
Boat Trail/Launch	850	150	1,000
Bicycle	0	0	0
Interpretation	383	68	450
Photography	400	600	1,000
Other Recreation	0	0	0
Hunting:			
Big Game	0	0	0
Small Game	120	80	200
Migratory Birds	5,745	3,830	9,575
Fishing:			
Freshwater	3,800	200	4,000
Saltwater	0	0	0
Total Visitation	**53,098**	**39,128**	**92,225**

Regional Economic Analysis

The economic area for the Refuge is the 7-county area shown in Table 8-6. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 8-8. Total expenditures were $5.2 million with non-residents accounting for $3.3 million or 64 percent of total expenditures. Expenditures on non-consumptive activities accounted for 85 percent of all expenditures.

Table 8-9 summarizes the local economic effects associated with recreation visits. Final demand totaled $8.8 million with associated employment of 52 jobs, $2.7 million in employment income and $1.3 million in total tax revenue.

Table 8-8. San Luis NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$1,518.1	$2,894.5	$4,412.6
Hunting	$235.0	$424.1	$659.1
Fishing	$102.2	$11.8	$114.0
Total Expenditures	**$1,855.3**	**$3,330.3**	**$5,185.6**

Table 8-9. San Luis NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$3,128.4	$5,643.4	$8,771.8
Jobs	20	32	52
Job Income	$969.9	$1,713.1	$2,683.0
Total Tax Revenue	$471.9	$798.7	$1,270.6

Table 8-10 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $3.09 means that for every $1 of budget expenditures, $3.09 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 8-10. San Luis NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
San Luis NWR	$2,700.0	$5,185.6	$3,155.3	$3.09

Sonny Bono Salton Sea National Wildlife Refuge

Description

Sonny Bono Salton Sea Refuge management programs maintain and improve habitat for wintering waterfowl and shorebirds. Waterfowl programs are designed to limit waterfowl depredations to adjacent croplands. The refuge provides habitat for over 375 bird species for many as a critical wintering or migration stopover area.

The refuge winters up to 30,000 snow, Ross's, and Canada geese, and 60,000 ducks from November through February. Marsh birds and shorebirds account for more than 6,000,000 use-days each year. Endangered species observed on the refuge include the Yuma clapper rail, and the desert pupfish.

A significant Yuma clapper rail population nests on the refuge. Sensitive species using the refuge include the fulvous whistling-duck, wood stork, long-billed curlew, mountain plover, western snowy plover, burrowing owl, and white-faced ibis.

Area Economy

Sonny Bono Salton Sea NWR is located in southwestern California southeast of Los Angeles. Table 8-11 shows the area economy. The area population increased by 23 percent from 2001 to 2011, compared with a 9 percent increase for California and a 9 percent increase for the U.S. as a whole. Area employment increased by 16 percent from 2001 to 2011, with California showing a 2 percent increase and the U.S. a 6 percent increase. Per capita income in the area increased by 10 percent over the 2001-2011 period, while California and the U.S. increased by 1 and 5 percent respectively.

Table 8-11. Sonny Bono Salton Sea NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Imperial CA	177.1	23%	69.9	16%	$28,351	10%
California	37,691.9	9%	19,969.3	2%	$43,647	1%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 8-12 shows the recreation visits for Sonny Bono Salton Sea NWR. The Refuge had 26,065 visits in 2011. Non-consumptive recreation accounted for 25,115 visits with residents comprising 6 percent of Refuge visitation.

Table 8-12. Sonny Bono Salton Sea NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	525	9,975	10,500
Auto Tour	668	12,687	13,355
Boat Trail/Launch	0	0	0
Bicycle	0	0	0
Interpretation	155	155	310
Photography	48	903	950
Other Recreation	0	0	0
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	95	855	950
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	**1,490**	**24,575**	**26,065**

Regional Economic Analysis

The economic area for the Refuge is Imperial County, California. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2011 are shown in Table 8-13. Total expenditures were $1.3 million with non-residents accounting for $1.2 million or 97 percent of total expenditures. Expenditures on non-consumptive activities accounted for 92 percent of all expenditures.

Table 8-14 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.5 million with associated employment of 12 jobs, $491,800 in employment income and $208,600 in total tax revenue.

Table 8-13. Sonny Bono Salton Sea NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$28.3	$1,144.0	$1,172.3
Hunting	$3.8	$93.4	$97.2
Fishing	$0.0	$0.0	$0.0
Total Expenditures	**$32.1**	**$1,237.4**	**$1,269.5**

Table 8-14. Sonny Bono Salton Sea NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$36.7	$1,437.4	$1,474.1
Jobs	0	12	12
Job Income	$11.7	$480.1	$491.8
Total Tax Revenue	$5.5	$203.1	$208.6

Table 8-15 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $1.24 means that for every $1 of budget expenditures, $1.24 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 8-15. Sonny Bono Salton Sea NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Sonny Bono Salton Sea NWR	$1,436.8	$1,269.5	$511.3	$1.24

Stillwater National Wildlife Refuge

Description

The Stillwater National Wildlife Refuge Complex (NWRC) consists of Stillwater, Fallon, and Anaho Island National Wildlife Refuges in northwestern Nevada. Together, these refuges encompass approximately 95,800 acres of wetland and upland habitats, freshwater and brackish water marshes, cottonwood and willow riparian areas, alkali playas, salt desert shrub lands, sand dunes, and a rocky island in a desert lake.

Nearly 400 wildlife species, including more than 260 bird species rely on these habitats. The refuges provide important migration, breeding, and wintering habitat for up to 1 million migratory birds, including waterfowl, shorebirds, colonial nesting water birds, and neotropical migratory birds. Stillwater and Fallon Refuges are part of the Lahontan Valley Shorebird Reserve, one of only 44 sites recognized for their international importance by the Western Hemispheric Shorebird Reserve Network.

Recreational opportunities abound on Stillwater National Wildlife Refuge. From waterfowl hunting to bird watching and wildlife observation, diverse habitats offer a variety of opportunities.

Area Economy

Stillwater NWR is located about 80 miles east of Reno in northwestern Nevada. Table 8-16 shows the area economy. The area population increased by 22 percent from 2001 to 2011, compared with a 30 percent increase for Nevada and a 9 percent increase for the U.S. as a whole. Area employment increased by 8 percent from 2001 to 2011, with Nevada showing an 18 percent increase and the U.S. a 6 percent increase. Per capita income in the area decreased by 11 percent over the 2001-2011 period, while Nevada showed a decrease of 6 percent, and the U.S. increased by 5 percent.

Table 8-16. Stillwater NWR: Summary of Area Economy, 2011
(Population & Employment in 000's; Per Capita Income in 2011 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2011	Percent change 2001-2011	2011	Percent change 2001-2011	2011	Percent change 2001-2011
Churchill NV	24.6	1%	23.4	44%	$42,281	25%
Lyon NV	51.9	44%	16.1	16%	$27,835	-10%
Storey NV	3.9	15%	3.9	148%	$33,924	-10%
Washoe NV	425.7	21%	244.8	4%	$41,790	-12%
Area Total	**506.1**	**22%**	**288.3**	**8%**	**$40,323**	**-11%**
Nevada	2,723.3	30%	1,498.2	18%	$36,964	-6%
United States	311,591.9	9%	175,834.7	6%	$41,560	5%

Source: U.S. Department of Commerce November 2012.

Activity Levels

Table 8-17 shows the recreation visits for Stillwater NWR. The Refuge had 8,882 visits in 2011. Non-consumptive recreation accounted for 5,620 visits with residents comprising 66 percent of Refuge visitation.

Table 8-17. Stillwater NWR: 2011 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Pedestrian	1,125	375	1,500
Auto Tour	2,100	700	2,800
Boat Trail/Launch	56	19	75
Bicycle	19	6	25
Interpretation	800	200	1,000
Photography	100	100	200
Other Recreation	10	10	20
Hunting:			
Big Game	2	0	2
Small Game	40	0	40
Migratory Birds	1,620	1,600	3,220
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	**5,872**	**3,010**	**8,882**

Regional Economic Analysis

The economic area for the Refuge is Churchill, Lyon, Storey, and Washoe Counties in Nevada. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2011 are shown in Table 8-18. Total expenditures were $305,600 with non-residents accounting for $187,700 or 61 percent of total expenditures. Expenditures on non-consumptive activities accounted for 40 percent of all expenditures.

Table 8-19 summarizes the local economic effects associated with recreation visits. Final demand totaled $480,100 with associated employment of 3 jobs, $145,400 in employment income and $62,300 in total tax revenue.

Table 8-18. Stillwater NWR: Visitor Recreation Expenditures (2011 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive	$68.2	$56.6	$124.8
Hunting	$49.6	$131.1	$180.7
Fishing	$0.0	$0.0	$0.0
Total Expenditures	**$117.8**	**$187.7**	**$305.6**

Table 8-19. Stillwater NWR: Local Economic Effects Associated with Recreation Visits (2011 $,000)

	Residents	Non-Residents	Total
Final Demand	$181.4	$298.8	$480.1
Jobs	1	2	3
Job Income	$56.9	$88.5	$145.4
Total Tax Revenue	$24.8	$37.5	$62.3

Table 8-20 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2011. For an individual, net economic value is that person's total willingness to pay for a particular recreation activity minus his or her actual expenditures for that activity. The figure for economic value is derived by multiplying net economic values for hunting, fishing, and non-consumptive recreation use (on a per-day basis) by estimated refuge visitor days for that activity. This figure is combined with the estimate of total expenditures and divided by the refuge budget for 2011. The $0.36 means that for every $1 of budget expenditures, $0.36 of total economic effects are associated with these budget expenditures. This ratio is provided only for the purpose of broadly comparing the magnitude of economic effects resulting from refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 8-20. Stillwater NWR: Summary of Local Economic Effects of Recreation Visits (2011 $,000)

	FY 2011 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Stillwater NWR	$1,464.9	$305.6	$217.8	$0.36

An Overview of Sample Refuges

Characteristics of Sample Refuges

The refuges selected for the detailed analysis are not a random sample. Instead, each refuge was chosen by the FWS Regional Office. The following tables are provided to compare the sample refuges to the refuge population as a whole.

Figure 9-1 shows the distribution of national wildlife refuges by recreational visitor days (RVDs). The sample represents each category well, except for the category for refuges with less than 10,000 RVDs which is underrepresented.

Figure 9-1. Percent of National Wildlife Refuges by Recreational Visitor Days

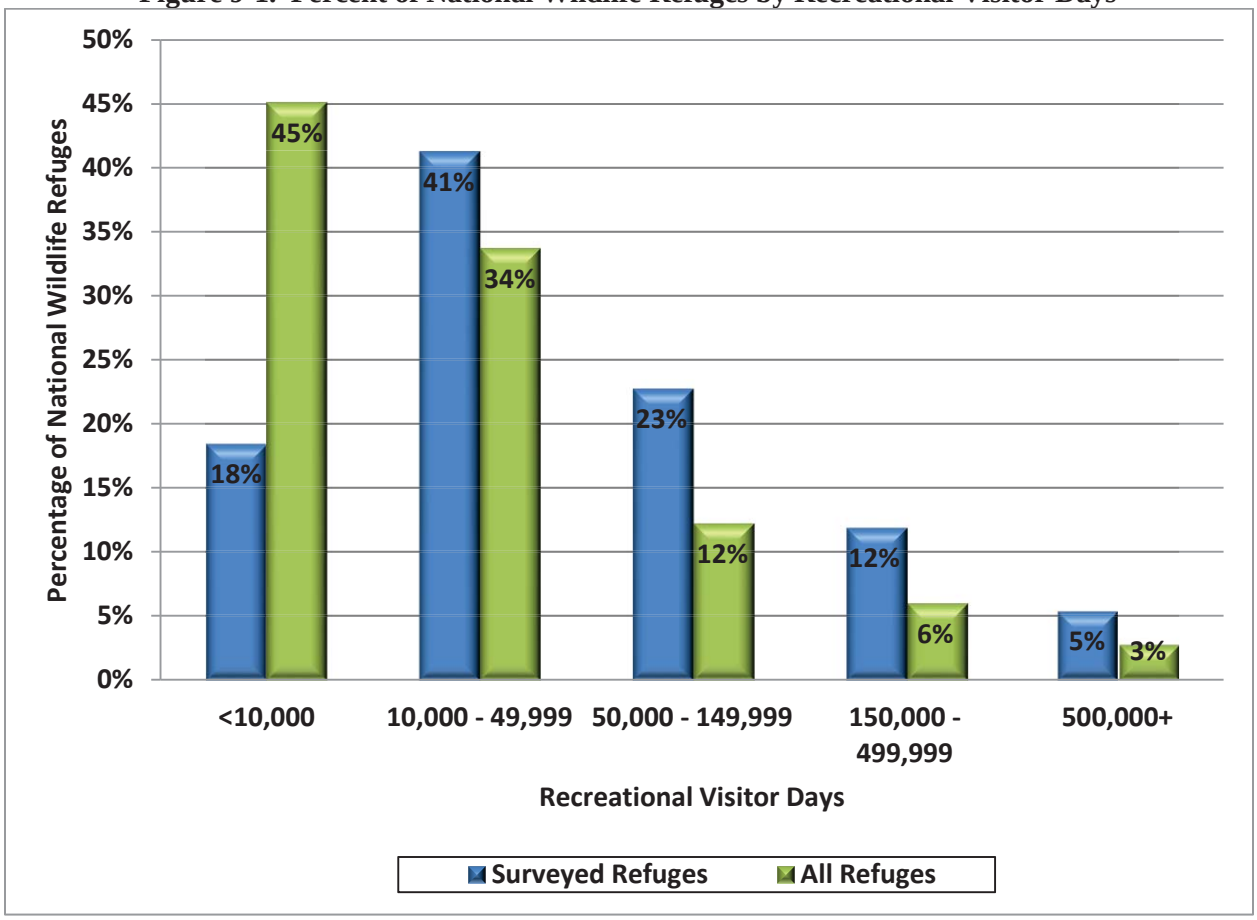
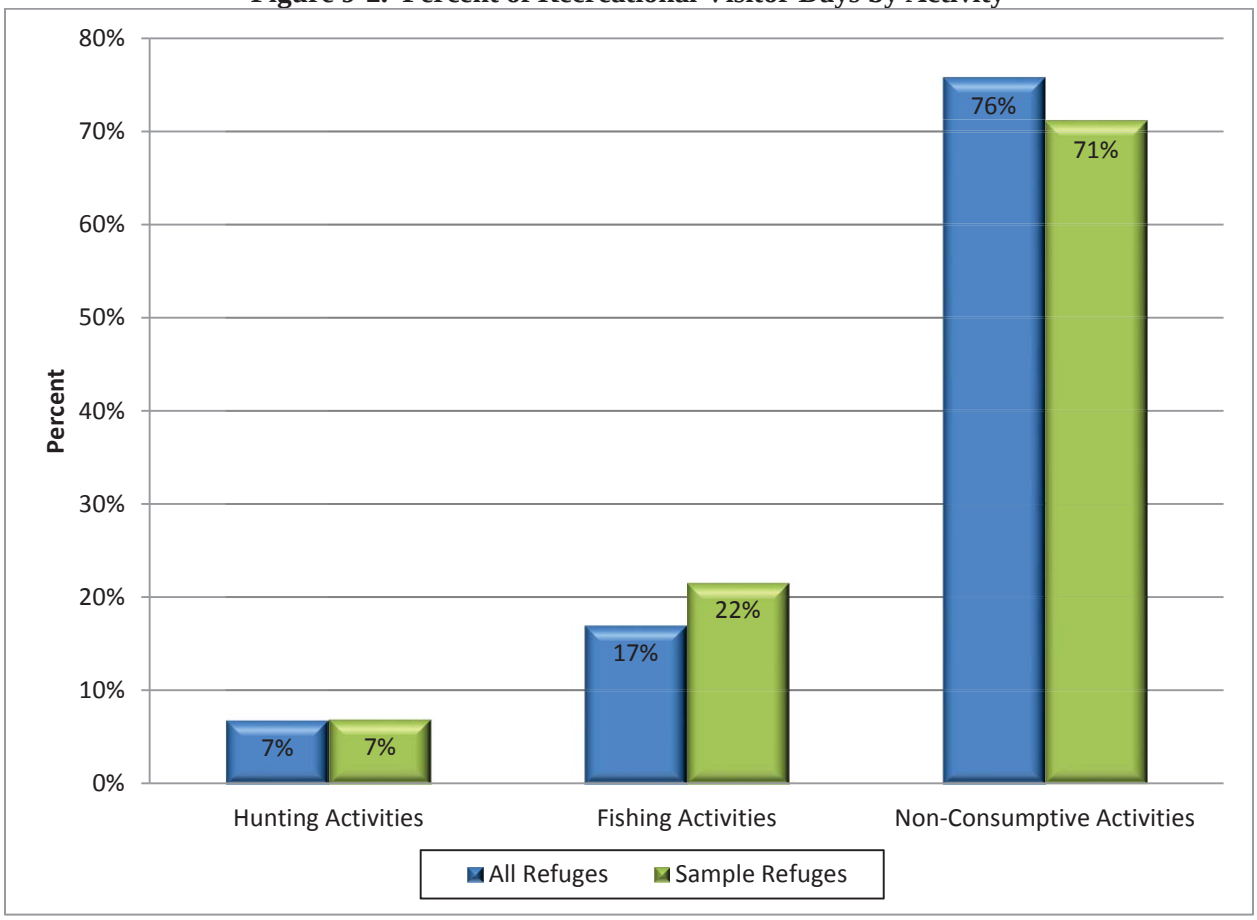


Figure 9-2 illustrates the percentage of RVDs across activities. The majority of RVDs are attributable to non-consumptive activities, followed by fishing activities and hunting activities. Again, the sample represents the refuge population well when comparing averages.

Figure 9-2. Percent of Recreational Visitor Days by Activity



Economic Effects of Sample Refuges

Many variables affect a refuge's economic impact on its local economy. Some relate to the refuge and its public use program; others relate to the economy of the region. This section recapitulates the results from the detailed case studies to highlight the differences among the sampled refuges. This information is not intended to rate refuges. Refuges serve many different purposes ─ a refuge with no public use, for example, could be vital to the survival of an endangered species. Each refuge must be viewed in light of its individual goals and how it achieves them.

Figure 9-3 illustrates the impact of non-resident visitors on total expenditures. Non-resident visitors are associated with 77 percent of the total expenditures for the sample refuges. This shows the proportionately greater impact of non-residents on local economies due to their higher daily expenditures compared to local visitors. The majority of expenditures are associated with non-consumptive activities, which is consistent with the majority of visitors partaking in non-consumptive activities.

Figure 9-3. Distribution of Expenditures by Resident and Non-Resident Visitors

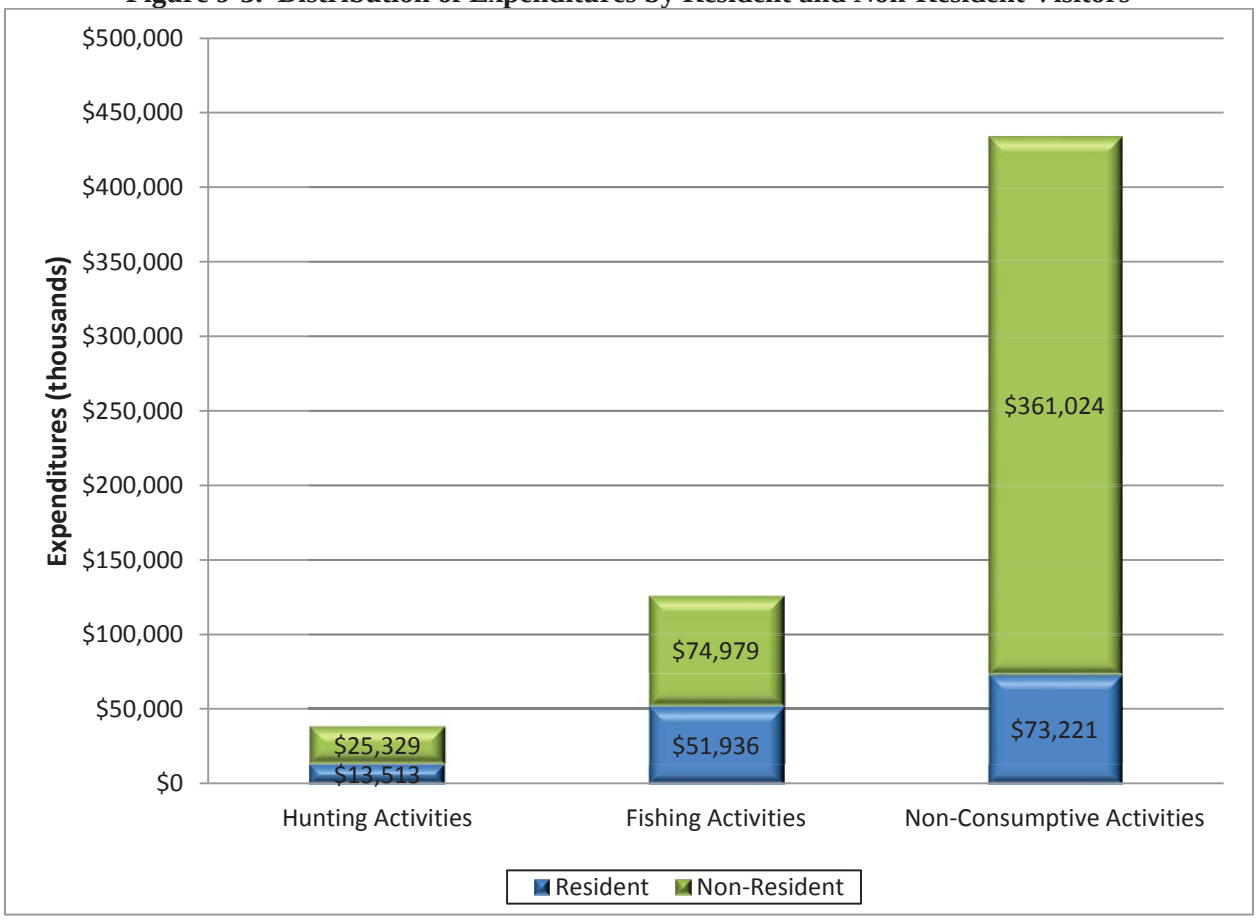


Figure 9-4 shows the distribution of recreational visitor days by region. The majority of visitors partake in non-consumptive activities. Six of the regions have less than 40 percent of their visitation attributed to hunting or fishing activities. However, consumptive activities accounted for 46 percent in Region 6 and 62 percent in Region 7. For Region 7, fishing activities were popular choices for visitors.

Figure 9-4. Distribution of Recreational Visitor Days by Region

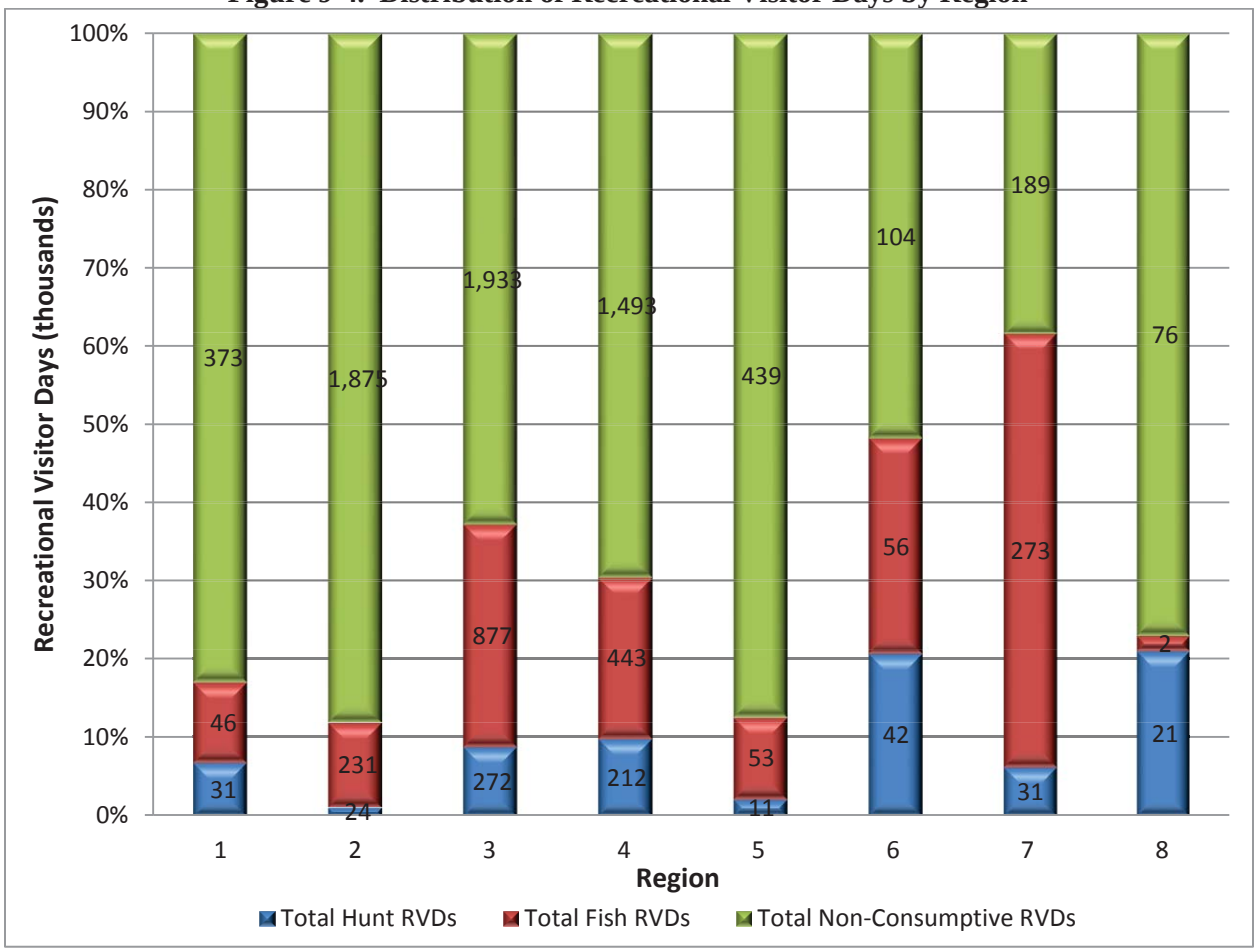


Table 9-1 shows the sample refuges with the highest final demand generated by recreational visitation. Compared to all the sample refuges, Upper Mississippi River NWFR had the highest recreational visitation (4.4 million visits) and the highest final demand ($161.4 million). A close look at Table 9-1 shows how differences in refuge use result in different economic results. Time spent, activities enjoyed, and residence of visitors determine refuge recreation economics. Crystal River NWR receives about 430,000 recreation visits annually compared with Crab Orchard NWR receiving about 729,000 recreation visits. Although Crab Orchard NWR receives about 70 percent more visits, the final demand for Crystal River is 69 percent higher than Crab Orchard NWR. This difference is because visitors to Crystal River NWR are travelling from outside the local area and spending more money on average than visitors to Crab Orchard NWR.

For information on other refuges, Appendix 3 summarizes the economic effects of the sample refuges.

Table 9-1 Top 10 National Wildlife Refuges Ranked by Final Demand

Refuge	Recreational Visitation	Final Demand $(,000)	Employment Income $(,000)	Jobs
Upper Mississippi River NWFR	4,437,390	$161,400	$47,000	1,394
Wichita Mountains NWR	3,187,148	$113,200	$34,700	1,053
Kenai NWR	572,584	$112,754	$32,406	907
Merritt Island NWR	1,191,741	$60,441	$18,077	467
Crystal River NWR	429,500	$38,136	$11,448	278
Laguna Atascosa NWR	440,042	$23,412	$6,549	205
Crab Orchard NWR	728,952	$22,600	$6,800	209
Okefenokee NWR	458,312	$20,788	$6,254	211
Pea Island NWR	603,150	$20,317	$6,219	201
National Bison Range	224,300	$20,120	$5,726	169

Economic Impacts of Birding

According to the 2011 National Survey of Fishing, Hunting and Wildlife-Associated Recreation published by the Fish and Wildlife Service, about 47 million Americans over the age of 16 observed birds last year. Participation in wildlife-watching (of which birding constitutes a significant portion) away from home has remained consistent as a recreational pursuit since 2006.

Watching birds on refuges continues to be an attractive non-consumptive activity System-wide. Birding can occur on virtually all refuges open to the public and just about any time of year. Moreover, visitors find that birds are usually accessible, attractive, and can serve as a functional portal to other aspects of nature-study. Watching birds can also be a high-quality activity for children and families and provides a great way to introduce them to the natural world.

Visitation to refuges for wildlife observation and photography continues to grow as illustrated in the general and individual refuge economic tables in this report. In FY 2011, birding visits continued to be an important activity for refuge visitors (Table 10-1). For some refuges, the primary visitor activity is birding. For example, Tualatin River NWR located on the outskirts of Portland,Oregon is a key stopping point on the Pacific Highway for migratory waterfowl, shorebirds, and songbirds. As a result, nearly all of the refuge's visitors take the opportunity to enjoy quality birding. Another refuge, John Heinz NWR at Tinicum located in Philadelphia, Pennsylvania, also offers an outstanding opportunity to view more than 300 species of birds.

Table 10-1. Birding Visitation on Sample Refuges: 50,000 or More Visits in FY 2011

National Wildlife Refuge	2011 FY Birding Visits
Horicon NWR	345,870
Upper Mississippi River NWR	300,000
Squaw Creek NWR	263,430
John Heinz NWR at Tinicum	163,516
Edwin B. Forsythe NWR	106,933
Great Swamp NWR	100,527
Hagerman NWR	85,865
Blackwater NWR	70,000
Tualatin River NWR	69,900
Santee NWR	67,748
Salt Plains NWR	64,287

Birding also has considerable expenditures associated with refuge visitation. Table 10-2 shows the refuges with the highest impact from birding visits.

Table 10-2. Birding Expenditures on Sample Refuges: $1 million or more in FY 2011 (2011$, '000's)

National Wildlife Refuge	2011 FY Expenditures
Upper Mississippi River NWR	$7,904,766
Horicon NWR	$5,481,654
Squaw Creek NWR	$2,359,815
Santee NWR	$2,172,227
Blackwater NWR	$1,929,565
Hagerman NWR	$1,553,232
Edwin B. Forsythe NWR	$1,492,999
John Heinz NWR at Tinicum	$1,297,375
Arthur R. Marshall Loxahatchee NWR	$1,088,476
Muleshoe NWR	$1,027,679

Quality birding is an outgrowth of the Refuge System's national and international role in conserving quality habitat. In fact, one-third of all Important Bird Areas (IBA) in the United States are located on National Wildlife Refuges (American Bird Conservancy, Random House, 2003), illustrating the key role that refuges play in attracting both birds and bird enthusiasts. Table 10-3 shows the national estimates that were derived using a combination of average ratios from the sample refuges in 2011 and from the sample refuges in 2006. As shown in Table 10-3, final demand associated with visits primarily for birding totaled $257 million. This is the total monetary value of economic activity generated by birding visits. In turn, this final demand generated $73.9 million in job income and 3,269 jobs.

Table 10-3. National Significance of Birding Visitation to Refuges

2011 FY Birding Visits	Final Demand ($2011 ,000)	Job Income ($2011 ,000)	Jobs
11.9 million	$257,433.4	$73,927.8	3,269

A National View

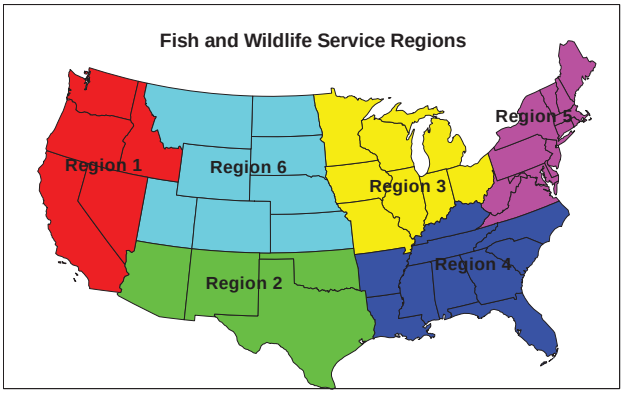
Aggregate National Economic Effects

Ninety-two refuges (including wetland management districts) were studied in detail for this report. Sample refuges were used to estimate the local economic effects of refuge visitation nationwide[2]. The methodology for this aggregation provides only a rough approximation at the refuge level. In the regional totals shown here, some of the errors for individual refuges will cancel out as they are added up, thus making the regional totals more reliable.

As shown in Table 11-1, final demand associated with recreation visits totaled nearly $2.4 billion. This is the total monetary value of economic activity generated by recreational refuge visitation. In turn, this final demand generated $792.7 million in job income and 35,058 jobs.

Region 4 had the most visitors in FY 2011. The region contains several very popular refuges such as Pea Island, Ding Darling, Merritt Island, and Okefenokee.

The National Park system as a whole received 278.9 million recreation visits in 2011. In 2011, Bureau of Land Management lands accounted for 67.0 million visitor days (U.S. Department of the Interior 2011). Although national wildlife refuges are used less intensively than the other federal lands, they are a major contributor to the mix of outdoor recreational opportunities in the United States.



2 Refer to the Introduction and Appendix 1 for further information.

Table 11-1. 2011 National Significance of Refuge Visitation by FWS Region

Fish and Wildlife Service Region	Visitors FY 2011	Final Demand ($2011 ,000)	Job Income ($2011 ,000)	Jobs
1	7,948,191	$323,930	$81,643	4,873
2	7,251,868	$283,532	$97,786	4,410
3	7,206,834	$375,687	$125,562	5,662
4	12,439,092	$661,034	$226,837	9,455
5	6,193,634	$309,337	$107,485	4,329
6	2,334,982	$211,013	$69,806	3,227
7	1,464,315	$164,950	$54,896	2,181
8	1,611,711	$82,143	$28,711	921
Total	**46,450,627**	**$2,411,627**	**$792,725**	**35,058**
Change from 2006	**+ 29.3%**	**+ 19.1%**	**+ 21.4%**	**+ 22.7%**

Note: **Change from 2006** is the percentage change from 2006 to 2011 excluding Region 7 (which was not included in the 2006 report) and adjusting the dollar figures for inflation.

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Note on the Appendices

The following appendices are intended to provide technical background information on the data, methods, and assumptions used to produce "Banking on Nature: The Economic Benefits to Local Communities of National Wildlife Refuge Recreation." The appendices should be read in conjunction with the report, especially the Introduction. There is very little expository material in the appendices.

Appendix 1 - Estimating Economic Impacts: General Methodology and Assumptions

This appendix explains the methodology and assumptions used to generate estimates of the sample refuges' impacts and the national aggregation of local impacts. It is intended for economists and others knowledgeable in impact analysis.

Appendix 2 - Regional Recreation Expenditures

This appendix shows the expenditure function by Fish and Wildlife Service region, activity, and residence .

Appendix 3 – Summary of Sample Refuges' Economic Effects

This appendix summarizes the data presented for the refuges in the sample.

Appendix 1: Estimating Economic Impacts

General Methodology and Assumptions

1. Model.

Economic impacts for the 92 sample refuges were estimated using IMPLAN, a regional input-output modeling system. For more information on IMPLAN and regional input-output economic analysis, see Taylor et. al. **Micro IMPLAN User's Guide**. U.S. Department of Agriculture - Forest Service. Fort Collins, CO, May 1993, and Olson and Lindall, **IMPLAN Professional Software, Analysis and Data Guide**., Stillwater, MN, 1996.

2. Data Set.

The 2008 IMPLAN data set was used for the analysis. All monetary impacts were adjusted to 2011dollars.

3. Expenditure Data

Per-person per-day expenditure information is based on the 2011 National Survey of Fishing, Hunting and Wildlife Associated Recreation (NSFHWR). This survey is conducted every 5 years by the U.S. Fish and Wildlife Service. Expenditure categories include: (1) **food,** including food, drink, and refreshments; (2) **lodging**, which includes lodging at motels, cabins, lodges, or campgrounds; (3) **transportation**, which includes both public transportation and the round-trip cost of transportation by private vehicle; and (4) **other**, which encompasses guide fees, pack trip or package fees, public land use or access fees, private land use or access fees (not including leases), equipment rental, and miscellaneous retail expenditures.

NSFHWR respondents were classified as non-residents if their state of residence differed from the state where the activity took place. Mean expenditures were calculated for each Fish and Wildlife Service region. Smaller geographic breakdowns left too few respondents in some categories for reliable averages.

Appendix 2 shows the per-day per-person expenditures for U.S. Fish and Wildlife Regions 1 through 8. These expenditures were allocated to IMPLAN sectors and activities as follows (Table 1a).

Table 1a. Allocation of Expenditures to IMPLAN Categories

Fish/ Hunt Survey Category	IMPLAN Activity/Sector	Percentage allocated to IMPLAN sector[3]
Lodging	hotels	100%
Food/drink	food for off-site consumption	Residents: 35% Non-residents 65%
..	purchased meals	Residents: 65% Non-residents: 35%
Air Transportation	airline	100%
Other Transportation	gas/oil	90%
..	car repairs	10%
Other	nondurable sport supplies	100%

4. Recreation Visits and Expenditures

(a) Visits to the refuge are assumed to be for the primary purpose of engaging in wildlife-dependent recreation activities.

(b) Visitor use data is based on information obtained from the U.S. Fish and Wildlife Service Division of Refuges' Refuge Annual Performance Plan (RAPP). Fiscal year 2011 data are used in this report.

(c) For the economic impact IMPLAN analysis, residents are defined as living within a 50-mile radius of the refuge; non-residents live outside of this area.

(d) Non-consumptive use is calculated by summing visitor use for nature trails, beach and water uses, wildlife observation, birding, observation towers/platforms/photo blinds, and other non-consumptive recreation specific to each refuge. Visitor use data for the 92 sample refuges were further refined by discussions with refuge personnel to minimize the possibility of double-counting visitors who engage in more than one activity during a given visit.

(e) It is assumed that all expenditures related to refuge visits occur primarily in the economic base area defined for the refuge.

[3]Percentage of spending in NSFHWR category allocated to specified IMPLAN activity or sector.

(f) Information on refuge visitors concerning trip destinations or the primary purpose of the trip is not currently available. To address the question of how much of total per-person per-day trip expenditures can be attributed to refuge visitation, the following assumptions were used for this study:

(i) On average, the more hours people spend on the refuge per trip, the higher the proportion of total daily trip expenditures are attributed to the refuge visit.

(ii) For hunting activities, visits are converted to recreation visitor days based upon the average number of hours that visitors engaged in hunting activities at the sample refuges. Thus, each refuge visitor day is then assumed to result in between one-half and three-fourths of the NSFHWR per-person per-day trip expenditures, depending on the type of hunting activity.

(iii) For fishing activities, visits are converted to recreation visitor days based upon the average number of hours that visitors engaged in non-consumptive activities at the sample refuges. Thus, each refuge visitor day is then assumed to result in about one-half of the NSFHWR per-person per-day trip expenditures for fishing activities.

(iv) For non-consumptive activities, visits are converted to recreation visitor days based upon the average number of hours that visitors engaged in non-consumptive activities at the sample refuges. Thus, each refuge visitor day is then assumed to result in just less than one-third of the NSFHWR per-person per-day trip expenditures for non-consumptive recreation.

5. Economic Study Area for the 92 Sample Refuges

In lieu of specific regional and local trade-flow information, IMPLAN economic study areas are defined as those counties adjacent or within the refuge which had a significant proportion of total refuge recreation expenditures. Significance was determined in consultation with refuge personnel and is based on estimates of where refuge visitors spent money and the location of major travel corridors. Generally, a conservative approach was taken in identifying counties to be included in the study area. Only spatial expenditure patterns and major travel corridors were used as criteria for determining counties to be included in the study area for each refuge. Backward linkages were not explicitly considered. It was decided that, given the lack of site-specific information on spending and trade flows, it would be better to underestimate economic impacts by keeping the study area small than to overestimate impacts by including counties marginally affected by refuge spending.

6. National Aggregation

One goal of this research is to generate estimates of the national impact of refuges on their regional economies. Ideally, an IMPLAN model and the necessary visitation information would be developed for each refuge and the results summed for a national estimate. Such a process would be prohibitively expensive. As an alternative, the results from 92 case studies can be treated as data points. National estimates were derived using a combination of average ratios from the sample refuges in 2011 and from the sample refuges in 2006. Ratios were derived for (1) final demand per recreation visit, (2) employment income per recreation visit, and (3) jobs per recreation visit. These ratios were averaged over 2006 and 2011 respectively (adjusting for inflation). Averaging over 2006 and 2011 provided more observations (data points) to improve the accuracy of the national estimates. These ratios were then

applied to estimate the economic impact of national wildlife refuges nationwide. This methodology is not the same as that used in reports prior to 2006 .

Adjustments were made to the data to ensure consistency. The sample refuges' recreational visitors ranged from 3,260 to 4.4 million. Refuges in the U.S. Territories were deleted from the calculations. These areas were considered to have very different local economies which this overall model did not capture well. The model applied the average length of stay for the sample refuges to all refuges.

This technique produces estimates of final demand, employment income and jobs created by all visitor spending at each refuge. From comparison of these predictions with the case study results, it was clear that the estimates could be wide of the mark. However, the predicted values were both too high and too low so it appeared that the deviations would balance each other when applied to aggregates of refuges. For this reason, the results for refuges outside of the study sample are not reported. Only regional and national aggregates are reported.

The national estimates and refuge case studies provide a rough scale of the economic significance of refuge recreation in local communities. These results are broadly descriptive. They are not intended to provide policy direction or performance measures. Refuge management balances multiple goals. This report highlights only one component.

Appendix 2: Regional Recreation Expenditures

Table 2a. Recreation Expenditures: Per Person Per Day, by Recreation Activity (2011 $)

	Non-Consumptive		Big Game Hunting		Small Game Hunting		Migratory Waterfowl Hunting		Freshwater Fishing		Saltwater Fishing	
Region	**Resident**	**Non-Resident**	**Resident**	**Non-Resident**	**Resident**	**Non-Resident**	**Resident**	**Non-Resident**	**Resident**	**Non-Resident**	**Resident**	**Non-Resident**
Region 1	$25.55	$155.11	$39.82	$201.03*	$17.20*	$93.49**	$48.56*	$109.26**	$32.03	$79.40	$65.69	$153.11**
Region 2	$24.67	$71.71	$40.05	$169.15*	$22.23	$93.49**	$32.28	$109.26**	$27.34	$89.71	$68.15	$64.87**
Region 3	$25.62	$64.16	$24.18	$55.90	$16.40	$49.94	$34.96	$109.26	$24.43	$61.30	$0.00	$0.00
Region 4	$21.92	$140.25	$26.34	$85.07	$21.30	$67.53*	$38.46	$94.86*	$20.01	$45.54	$61.59	$61.59
Region 5	$17.20	$100.82	$21.56	$53.45	$29.60	$92.32*	$29.81	$45.73*	$22.08	$74.87	$53.61	$103.08
Region 6	$38.06	$163.62	$37.96	$207.14	$30.59	$150.59	$29.36	$135.39*	$32.14	$108.48	$0.00	$0.00
Region 7	$58.58	$457.14	$58.58	$457.14	$58.58	$457.14	$58.58	$457.14	$58.58	$457.14	$58.58	$457.14
Region 8	$55.37	$131.96	$134.83	$113.40**	$52.70	$93.49**	$40.09	$109.26**	$53.77	$117.98	$86.38	$207.31**

Note: Expenditures denoted by * have small sample sizes (n=10 to 30). Expenditures denoted by ** are national averages because sample sizes were too small to report data reliably (n<10).

Appendix 3: Sample Refuges' Economic Impacts

Table 3a. Sample Refuges' Visitation and Economic Significance

Refuge Name	Region	Total Recreational Visitation	Total Final Demand $(,000)	Total Employment Income $(,000)	Total Jobs
Agassiz NWR	3	8,500	$202	$58	2
Alamosa NWR	6	3,260	$45	$14	2
Alaska Peninsula NWR	7	8,196	$1,614	$487	12
Alligator River NWR	4	51,793	$1,823	$567	17
Anahuac NWR	2	91,593	$3,164	$966	23
Arthur R. Marshall Loxahatchee NWR	4	306,866	$15,252	$4,549	107
Assabet River NWR	5	119,130	$2,078	$689	12
Back Bay NWR	5	123,660	$3,073	$914	27
Big Oaks NWR	3	8,075	$332	$99	3
Blackwater NWR	5	82,163	$2,480	$766	23
Buenos Aires NWR	2	21,908	$1,488	$425	11
Cache River NWR	4	381,510	$11,796	$3,572	100
Camas NWR	1	13,513	$250	$68	2
Canaan Valley NWR	5	44,795	$952	$284	9
Chickasaw NWR	4	73,175	$3,176	$968	25
Columbia NWR	1	51,873	$2,037	$585	16
Conboy Lake NWR	1	5,605	$466	$58	4
Crab Orchard NWR	3	728,952	$22,600	$6,800	209
Crystal River NWR	4	429,500	$38,136	$11,449	278
Cypress Creek NWR	3	25,300	$710	$215	7
Deep Fork NWR	2	45,645	$1,310	$403	9
Dungeness NWR	1	111,628	$2,802	$861	25
Eastern Neck NWR	5	92,150	$930	$287	9
Eastern Shore Of Virginia NWR	5	36,625	$1,596	$523	14
Edwin B. Forsythe NWR	5	223,924	$6,006	$1,858	45
Egmont Key NWR	4	441,600	$15,141	$4,576	114
Felsenthal NWR	4	424,550	$19,631	$5,774	197
Flint Hills NWR	6	4,410	$164	$49	2
Great Dismal Swamp NWR	5	65,320	$2,430	$709	22
Great Swamp NWR	5	183,441	$3,159	$1,005	19
Hagerman NWR	2	152,550	$4,037	$1,153	34
Hanford Reach	1	33,925	$2,015	$593	17
Hart Mountain National Antelope Refuge	1	14,962	$942	$325	10

Refuge Name	Region	Total Recreational Visitation	Total Final Demand $(,000)	Total Employment Income $(,000)	Total Jobs
Hobe Sound NWR	4	107,400	$2,464	$738	17
Horicon NWR	3	392,199	$8,970	$2,620	88
Illinois River	3	18,388	$392	$119	3
Iowa WMD	3	76,839	$794	$220	8
J. Clark Salyer NWR	6	80,340	$4,345	$1,317	40
John Heinz NWR at Tinicum	5	177,435	$2,528	$811	18
Kenai NWR	7	572,584	$112,755	$32,407	907
Kodiak NWR	7	50,855	$9,696	$2,934	65
Kootenai NWR	1	94,952	$1,326	$386	15
Koyukuk NWR	7	11,623	$1,078	$331	8
Laguna Atascosa NWR	2	440,042	$23,413	$6,549	205
Las Vegas NWR	2	16,837	$161	$48	1
Little Pend Oreille NWR	1	64,130	$3,883	$1,162	30
Little River NWR	2	15,150	$431	$135	4
Lower Hatchie NWR	4	65,050	$3,333	$1,124	29
Maine Coastal Islands	5	155,245	$7,874	$2,203	71
Malheur NWR	1	119,075	$13,399	$1,162	140
Marais des Cygnes NWR	6	3,295	$237	$72	2
McFaddin NWR	2	26,801	$1,742	$529	16
McNary NWR	1	42,095	$1,561	$442	14
Merritt Island NWR	4	1,191,741	$60,442	$18,077	467
Moosehorn NWR	5	22,396	$415	$120	4
Morris WMD	3	72,870	$4,499	$1,287	40
Muleshoe NWR	2	25,360	$1,885	$544	14
National Bison Range	6	224,300	$20,121	$5,726	169
Nisqually NWR	1	203,815	$5,550	$588	41
Occoquan Bay NWR	5	25,438	$241	$76	2
Okefenokee NWR	4	458,312	$20,789	$6,254	211
Pea Island NWR	4	603,150	$20,317	$6,219	201
Pocosin Lakes NWR	4	70,150	$2,181	$664	25
Ridgefield NWR	1	164,525	$5,630	$1,682	39
Sacramento NWR	8	71,514	$3,846	$1,133	28
Salt Plains NWR	2	103,130	$1,926	$610	15
San Luis NWR	8	92,225	$8,772	$2,683	52
Sand Lake NWR	6	9,193	$801	$235	7
Santee NWR	4	174,178	$5,595	$1,586	56
Seedskadee NWR	6	13,410	$614	$178	5
Selawik NWR	7	21,203	$1,409	$419	9
Sheldon NWR	1	35,929	$1,290	$396	10

Refuge Name	Region	Total Recreational Visitation	Total Final Demand $(,000)	Total Employment Income $(,000)	Total Jobs
Sonny Bono Salton Sea NWR	8	26,065	$1,474	$492	12
Squaw Creek NWR	3	294,003	$3,465	$1,006	32
St. Marks NWR	4	753,881	$17,238	$5,108	157
Steigerwald Lake NWR	1	44,531	$1,361	$407	10
Stewart B. McKinney NWR	5	14,935	$389	$130	2
Stillwater NWR	8	8,882	$480	$145	3
Tetlin NWR	7	90,624	$9,974	$3,000	66
Tewaukon NWR	6	2,824	$159	$45	2
Togiak NWR	7	32,827	$14,255	$4,295	95
Trinity River NWR	2	18,340	$475	$144	4
Tualatin River NWR	1	103,780	$1,627	$703	17
Turnbull NWR	1	54,196	$1,075	$321	8
Two Rivers NWR	3	11,070	$160	$47	1
Union Slough NWR	3	6,130	$51	$15	0
Upper Mississippi River NWR	3	4,437,390	$161,400	$47,000	1,394
Valentine NWR	6	23,375	$2,710	$781	28
Waccamaw NWR	4	7,691	$226	$82	4
Waubay WMD	6	62,625	$3,218	$945	32
Wichita Mountains Wildlife Refuge	2	3,187,148	$113,200	$34,700	1,053
Willapa NWR	1	103,780	$2,563	$720	21