BANKING ON NATURE 2006:

The Economic Benefits to Local Communities of National Wildlife Refuge Visitation

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Washington, DC

September 2007

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Executive Summary

Banking on Nature 2006: 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) (2007), and the Division of Refuge's Refuge Annual Performance Plan (RAPP) (2006 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. To remain consistent with past studies, refuges located outside the continental United States and refuges with less than 1,500 visitors are excluded from the national estimate. The National View section concludes by examining how the findings for 71 of the 80 sample refuges apply to six of seven U.S. Fish and Wildlife Service geographical regions. Consequently, the national estimates discussed in this section reflect refuge visitation and economic impacts ***only*** for the lower 48 states and for refuges with more than 1,500 visitors. 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 2006, 34.8 million people visited refuges in the lower 48 states for recreation. Their spending generated almost $1.7 billion of sales in regional economies. As this spending flowed through the economy, nearly 27,000 people were employed and $542.8 million in employment income was generated.

* About 82 percent of total expenditures are generated by non-consumptive activities on refuges. Fishing accounted for 12 percent and hunting 6 percent. Local residents accounted for 13 percent of expenditures while visitors coming from outside the local area accounted for 87 percent.

* Refuge recreational spending generated about $185.3 million in tax revenue at the local, county, state and Federal level.

* Surveys show refuge visitors would have been willing to pay more for their visit than it actually cost them. The difference between what they were willing to pay and what they actually paid is their net economic value or consumer surplus. Visitors enjoyed a consumer surplus of nearly $860 million in 2006. Over $664 million of this amount (77 percent of total net economic value) accrued to non-consumptive visitors.

The above results include refuge visitation in the contiguous United States. The case-study results were expanded to encompass the Refuge System in 48 states. 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 80 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 80 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 80 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.

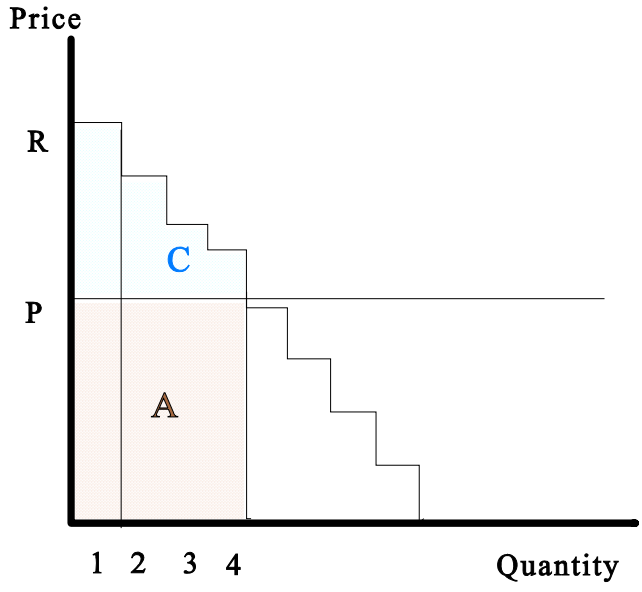
Recreation is a special kind of good. Recreationists at a refuge pay for their recreation not only in entrance fees but in the costs of traveling and staying near the refuge and taking time away from other activities. In Figure 1, all of the recreationist's costs to obtain recreation compose rectangle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

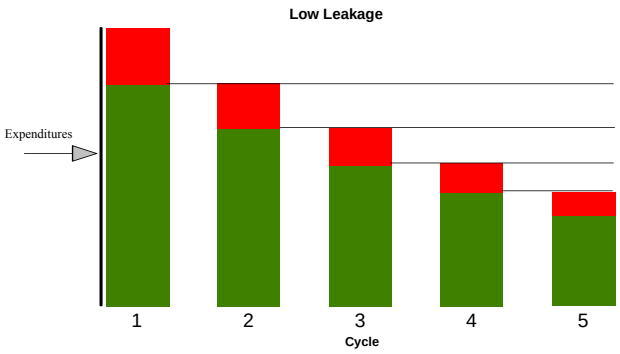
Time is an unusual good. Spending it, outside of paid work, does not result in a flow of money from one person to another. No one pays you to watch television, for example. Similarly, refuge visitors' opportunity cost of time, although it is an important component in the cost of recreation, has little 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.

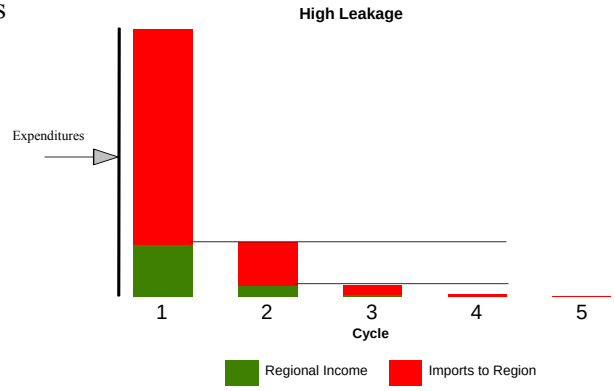
Expenditures and the Regional Economy

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 FWS National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (NSFHWR) and the FWS Refuge Annual Performance Plan (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 80 refuges' local economies. (For purposes of this study, a region is defined as the area within 30 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 548 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

Daily expenditure information for this study was extracted from the NSFHWR trip expenditure database (U.S. Department of the Interior et al. 2007). 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

[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.

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 3.

Lodging expenditures appear very low in this data, ranging from $0.36 per day to $42 per day (in the lower 48 states). 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., 1998). 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 30 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. (These budgets are shown in Appendix 3). 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 2006 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 69 of the case studies can be treated as data points. (To remain consistent with past studies, refuges with less than 1,500 visitors or located outside the continental United States were not included in this model. Therefore, the number of data points is slightly less than the number of refuges in the detailed sample.) National estimates were derived using average ratios from the sample refuges. 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 then applied to estimate the economic impact of national wildlife refuges nationwide. This methodology is not the same as that used in earlier reports.

Several adjustments were made to the data to ensure consistency. The sample refuges' recreational visitation ranged from 522 to 6.3 million. Applying the ratios derived from this sample to refuges with very low visitation yielded very high estimates of final demand. To avoid adding these into the national results, all refuges with fewer than 1,500 visits were deleted from the calculations. This eliminated about 135 refuges but relatively few visits. Refuges in Alaska, Hawaii, and the U.S. Territories were also 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.

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. Essentially the same process was followed for the refuges outside the sample. Outside the sample, detailed information was not available on the amount of time spent in each activity on a refuge. This was not a problem for hunting and fishing, as it had been assumed that these were full-day activities for the most part. Non-consumptive use was adjusted to recreational visitor days using the average length of time such visitors stayed at the sample refuges ─ about 2.8 hours. For states with too few observations to measure the net economic value, the national mean was substituted.

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 2006 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

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 30 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 California, Hawaii, Nevada, Oregon, and Washington. Sample refuges selected within this region include:

Bandon Marsh NWR (Oregon)
Camas NWR (Idaho)
Deer Flat NWR (Idaho)
Dungeness NWR (Washington)
Hakalau Forest NWR (Hawaii)
Kilauea Point NWR (Hawaii)
Malheur NWR (Oregon)
McNary NWR (Washington)
Nisqually NWR (Washington)
Ridgefield NWR (Washington)
Turnbull NWR (Washington)
Umatilla NWR (Oregon)
William Finley NWR (Oregon)

Bandon Marsh National Wildlife Refuge

Description

Bandon Marsh Refuge is located along the picturesque southern Oregon coast near the mouth of the Coquille River, and the city of Bandon. There are two units to the Bandon Marsh NWR: Bandon Marsh Unit and Ni-les'tun Unit.

The Bandon Marsh Unit protects the largest remaining tract of salt marsh within the Coquille River estuary. Major habitats include undisturbed salt marsh, mudflat, and Sitka spruce and alder river bank communities. These provide resting and feeding areas for migratory waterfowl, shorebirds, wading birds, neotropical migrants, and raptors. The lower Coquille River estuary provides important habitat for juvenile and adult forms of anadromous fish species found in the lower Coquille River estuary including Coho and Chinook salmon, steelhead, and cutthroat trout. Wildlife observation and study, photography, hunting, fishing, and clamming are permitted public uses.

The Ni-les'tun Unit of the Bandon Marsh NWR was named by Coquille Indian Tribe. Ni-les'tun means "small fish dam in the river," and refers to the numerous fish weirs located on, and adjacent to the site, which were used by Coquille ancestors for capturing fish. This refuge unit is managed as a natural area with no habitat manipulation. Most of the land in the Ni-les'tun Unit is diked lowland pasture and will eventually be restored to tidal marsh, making history as the largest tidal marsh restoration project ever attempted in Oregon. Other habitats of the Ni-les'tun Unit include intertidal marsh, forested wetlands, grasslands, and upland forest.

Area Economy

Bandon Marsh NWR is located on the coast in Coos County in southwestern Oregon. Table 1-1 shows the area economy. The county population increased by 1.6 percent from 1995 to 2005, compared with a 14.3 percent increase for the state of Oregon and a 11.4 percent increase for the U.S. as a whole. County employment increased by 17.4 percent from 1995 to 2005, with the state of Oregon showing a 20.2 percent increase and the U.S. a 17.0 percent increase. Per capita income in Coos County increased by 13.7 percent over the 1995-2005 period, while the state of Oregon and the U.S. increased by 9.7 and 13.2 percent respectively.

Table 1-1. Bandon Marsh NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 2005-2005
Coos, OR	64.6	1.6 %	33.8	17.4 %	$26,953	13.7 %
Oregon	3,638.9	14.3 %	2,232.7	20.2 %	$32,289	9.7 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 1-2 shows the recreation visits for Bandon Marsh NWR. The Refuge had 4,050 visits in 2006. Visitors enjoyed non-consumptive activities, migratory bird hunting, and saltwater fishing.

Table 1-2. Bandon Marsh NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	0	0	0
Observation Platforms	1,486	2,229	3,715
Wildlife Observation	44	66	110
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	160	40	200
Fishing:			
Freshwater	0	0	0
Saltwater	13	13	25
Total Visitation	***1,703***	***2,348***	***4,050***

Regional Economic Analysis

The economic area for the Refuge is Coos County Oregon. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 1-3 . Total expenditures were $46,400 with non-residents accounting for $36,300 or 78 percent of total expenditures. Expenditures on non-consumptive activities accounted for 82 percent of all expenditures, followed by hunting and fishing at 16 and 2 percent respectively.

Table 1-3. Bandon Marsh NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Total Non-Consumptive	$5.9	$32.2	$38.0
Hunting:			
Big Game	—	—	—
Small Game	—	—	—
Migratory Birds	$4.0	$3.5	$7.4
Total Hunting	$4.0	$3.5	$7.4
Fishing:			
Freshwater	—	—	—
Saltwater	$0.2	$0.7	$0.9
Total Fishing	$0.2	$0.7	$0.9
Total Expenditures	***$10.1***	***$36.3***	***$46.4***

Table 1-4 summarizes the local economic effects associated with recreation visits. Final demand totaled $45,600 with associated employment of 1 job, $17,900 in employment income and $6,200 in total tax revenue.

Table 1-4. Bandon Marsh NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$9.7	$36.0	$45.6
Jobs	0	1	1
Job Income	$4.3	$13.7	$17.9
Total Tax Revenue	$1.4	$4.8	$6.2

Table 1-5 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $0.19 means that for every $1 of budget expenditures, $0.19 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 1-5. Bandon Marsh NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Bandon Marsh NWR	$386.0	$46.4	$27.6	$0.19

Camas National Wildlife Refuge

Description

About half of the Camas National Wildlife Refuge in southeastern Idaho consists of lakes, ponds, and marshlands; the remainder is grass sagebrush uplands, meadows, and farm fields. Camas Creek flows through the length of the refuge. Water management is a critical component of Camas Refuge operations. An extensive system of canals, dikes, wells, ponds, and water-control structures is used to manipulate water for the benefit of wildlife, with an emphasis on nesting waterfowl. Haying and prescribed fire are used to manipulate vegetation in some fields, and small grain crops are grown to provide supplemental feed for geese and cranes and to keep them from damaging private croplands.

During migration, which peaks in March-April and October, up to 50,000 ducks and 3,000 geese may be present on the refuge. Tundra and trumpeter swans visit in the hundreds during migration. The refuge has become a popular swan watching destination with hundreds of tundra and trumpeter swans stopping over during migration. Several state record songbird observations have been made in refuge cottonwood groves on the refuge.

Area Economy

Camas NWR is located in southeastern Idaho. Table 1-6 shows the area economy. The area population increased by 16.7 percent from 1995 to 2005, compared with a 21.4 percent increase for the state of Idaho and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 34.8 percent from 1995 to 2005, with the state of Idaho showing a 29.3 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 11.1 percent over the 1995-2005 period, while the state of Idaho and the U.S. increased by 11.1 and 13.2 percent respectively.

Table 1-6. Camas NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 2005-2005
Bonneville, ID	91.8	15.3%	62.2	35.2%	$29,642	14.9%
Jefferson, ID	21.6	18.5%	9.5	32.7%	$21,315	6.6%
Madison, ID	31.2	19.6%	16.9	34.1%	$16,489	10.5%
Area Total	144.5	16.7%	88.6	34.8%	$22,482	11.1%
Idaho	1,429.4	21.4%	868.4	29.3%	$28,478	11.1%
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 1-7 shows the recreation visits for Camas NWR. The Refuge had 6,565 visits in 2006. Almost all of the visits were for non-consumptive recreation with residents accounting for 60 percent of all visits.

Table 1-7. Camas NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	225	150	375
Observation Platforms	360	240	600
Birding	1,200	800	2,000
Other Wildlife Observation	585	390	975
Beach /Water Use	0	0	0
Other Recreation	1,560	1,040	2,600
Hunting:			
Big Game	0	0	0
Small Game	5	0	5
Migratory Birds	10	1	10
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	***3,944***	***2,621***	***6,565***

Regional Economic Analysis

The economic area for the Refuge are the counties of Bonneville, Jefferson and Madison in Idaho. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2006 are shown in Table 1-8. Total expenditures were $107,300 with non-residents accounting for $75,800 or 71 percent of total expenditures. Expenditures on non-consumptive activities accounted for almost all of the expenditures.

Table 1-8. Camas NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$17.9	$43.6	$61.5
Other Non-Consumptive	$13.2	$32.1	$45.4
Total Non-Consumptive	$31.2	$75.7	$106.9
Hunting:			
Big Game	—	—	—
Small Game	$0.1	—	$0.1
Migratory Birds	$0.2	$0.1	$0.3
Total Hunting	$0.3	$0.1	$0.4
Fishing:			
Freshwater	—	—	—
Saltwater	—	—	—
Total Fishing	—	—	—
Total Expenditures	***$31.5***	***$75.8***	***$107.3***

Table 1-9 summarizes the local economic effects associated with recreation visits. Final demand totaled $110,800 with associated employment of 2 jobs, $91,900 in employment income and $14,400 in total tax revenue.

Table 1-9. Camas NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$33.1	$77.7	$110.8
Jobs	1	1	2
Job Income	$14.2	$77.8	$91.9
Total Tax Revenue	$4.5	$9.9	$14.4

Table 1-10 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $0.51 means that for every $1 of budget expenditures, $0.51 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 1-10. Camas NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Camas NWR	$369.0	$107.3	$79.2	$0.51

Deer Flat National Wildlife Refuge

Description

Deer Flat National Wildlife Refuge, established in 1909, is one of the nation's oldest refuges. Located southwest of Boise, Idaho, the refuge includes the Lake Lowell sector (10,588 acres) and the Snake River Islands sector (about 800 acres). Lake Lowell is an irrigation project reservoir that provides an oasis for wildlife in this arid region.

The late-summer drawdown of the lake reveals mud flats that provide food for a variety of resident and migratory wildlife. Historic wintering waterfowl populations averaged over 300,000 birds. This number has now declined to near 100,000. The Snake River Islands (101 islands along 113 miles of river) provide a diversity of habitats from small wetlands to sagebrush uplands. Several islands house heron rookeries and gull colonies, and provide feeding and resting spots for migratory birds. The refuge is popular with the public. Each year, more than 100,000 people visit to hunt, fish, photograph and view wildlife, learn about natural resources through displays and programs at the visitor center, and walk the nature trail.

Area Economy

Deer Flat NWR is located southwest of Boise Idaho. Table 1-11 shows the area economy. The area population increased by 34.5 percent from 1995 to 2005, compared with a 21.4 percent increase for the state of Idaho and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 37 percent from 1995 to 2005, with the state of Idaho showing a 29.3 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by 8 percent over the 1995-2005 period, while the state of Idaho and the U.S. increased by11.1 and 13.2 percent respectively.

Table 1-11. Deer Flat NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 2005-2005
Ada ID	345.4	34.5%	258.3	41.4%	$39,302	11.8%
Canyon ID	165.0	50.0%	74.2	37.8%	$20,397	-6.2%
Owyhee ID	11.0	15.4%	4.3	16.8%	$22,089	11.9%
Payette ID	22.1	15.0%	9.3	17.9%	$24,025	23.8%
Washington ID	10.1	7.0%	5.0	9.8%	$22,548	9.2%
Malheur OR	31.3	5.9%	18.5	7.1%	$21,609	-2.6%
Area Total	**585.0**	**34.6%**	**369.5**	**37.0%**	**$24,995**	**8.0 %**
Idaho	1,429.4	21.4 %	868.4	29.3 %	$28,478	11.1 %
United States	296,507.1	11.4%	174,249.6	17.0%	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 1-12 shows the recreation visits for Deer Flat NWR. The Refuge had 118,131 visits in 2006. Non-consumptive use accounted for 84 percent of all visits, fishing for 13 percent and hunting for 3 percent. Residents accounted for the vast majority of all visits to the Refuge.

Table 1-12. Deer Flat NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	2,744	56	2,800
Observation Platforms	196	4	200
Wildlife Observation	12,408	253	12,661
Beach /Water Use	82,944	838	83,782
Other Recreation	0	0	0
Hunting:			
Big Game	165	0	165
Small Game	1,120	11	1,131
Migratory Birds	2,188	22	2,210
Fishing:			
Freshwater	15,030	152	15,182
Saltwater	0	0	0
Total Visitation	***116,795***	***1,336***	***118,131***

Regional Economic Analysis

The economic area for the Refuge is a six county area including Ada, Canyon, Owyhee, Payette, and Washington counties in Idaho and Malheur County in Oregon. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2006 are shown in Table 1-13. Total expenditures were $1.7 million with residents accounting for $1.6 million. Expenditures on non-consumptive activities accounted for 83 percent of all expenditures, followed by fishing and hunting at 12 and 5 percent respectively.

Table 1-13. Deer Flat NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Total Non-Consumptive	$1,344.1	$53.4	$1,397.5
Hunting:			
Big Game	$3.8	—	$3.8
Small Game	$20.3	$0.9	$21.2
Migratory Birds	$54.5	$1.9	$56.4
Total Hunting	$78.6	$2.8	$81.4
Fishing:			
Freshwater	$206.1	$3.4	$209.5
Saltwater	—	—	—
Total Fishing	$206.1	$3.4	$209.5
Total Expenditures	***$1,628.8***	***$59.6***	***$1,688.4***

Table 1-14 summarizes the local economic effects associated with recreation visits. Final demand totaled $2.0 million with associated employment of 33 jobs, $852,500 in employment income and $277,500 in total tax revenue.

Table 1-14. Deer Flat NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$1,954.3	$74.0	$2,028.3
Jobs	32	1	33
Job Income	$825.3	$27.1	$852.5
Total Tax Revenue	$267.8	$9.7	$277.5

Table 1-15 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $10.29 means that for every $1 of budget expenditures, $10.29 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 1-15. Deer Flat NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Deer Flat NWR	$401.0	$1,688.4	$2,438.3	$10.29

Dungeness National Wildlife Refuge

Description

At Dungeness Refuge, one of the world's longest natural sand spits softens the rough sea waves to form a quiet bay and harbor, gravel beaches, and tideflats. Here wildlife find food, a place to rest, and protection from winds and pounding surf. 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 species. Over 250 species of birds and 41 species of land mammals have been recorded on the refuge along with eight species of marine mammals.

Approximately 8,000 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 the state of Washington. Table 1-16 shows the county economy. The county population increased by 11.9 percent from 1995 to 2005, compared with a 14.8 percent increase for the state of Washington and a 11.4 percent increase for the U.S. as a whole. County employment increased by 24.7 percent from 1995 to 2005, with the state of Washington showing a 19.5 percent increase and the U.S. a 17.0 percent increase. Per capita income in Clallam County increased by 11.0 percent over the 1995-2005 period, while the state of Washington and the U.S. increased by 13.5 and 13.2 percent respectively.

Table 1-16. Dungeness NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 2005-2005
Clallam WA	69.5	11.9%	35.9	24.7%	$29,267	11.0 %
Washington	6,291.9	14.8 %	3,733.4	19.5 %	$35,478	13.5 %
United States	296,507.1	11.4%	174,249.6	17.0%	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 1-17 shows the recreation visits for Dungeness NWR. The Refuge had 89,200 visits in 2006. Almost all of the visits were for non-consumptive recreation with non-residents accounting for 62 percent of all visits.

Table 1-17. Dungeness NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	6,662	2,221	8,882
Observation Platforms	4,441	4,441	8,882
Birding	5,551	16,654	22,205
Other Wildlife Observation	1,110	3,331	4,441
Beach /Water Use	15,544	28,867	44,410
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	150	50	200
Total Visitation	***33,458***	***55,563***	***89,020***

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 2006 are shown in Table 1-18. Total expenditures were $2.4 million with non-residents accounting for $2.1 million or 87 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 $2.3 million with associated employment of 38 jobs, $924,800 in employment income and $302,400 in total tax revenue.

Table 1-18. Dungeness NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$62.2	$680.5	$742.7
Other Non-Consumptive	$253.0	$1,436.6	$1,689.7
Total Non-Consumptive	$315.3	$2,117.2	$2,432.4
Hunting:			
Big Game	—	—	—
Small Game	—	—	—
Migratory Birds	—	—	—
Total Hunting	—	—	—
Fishing:			
Freshwater	—	—	—
Saltwater	$1.3	$1.4	$2.7
Total Fishing	$1.3	$1.4	$2.7
Total Expenditures	***$316.5***	***$2,118.6***	***$2,435.1***

Table 1-19. Dungeness NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$318.0	$2,007.0	$2,325.1
Jobs	6	32	38
Job Income	$141.5	$783.3	$924.8
Total Tax Revenue	$42.5	$259.9	$302.4

Table 1-20 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $8.57 means that for every $1 of budget expenditures, $8.57 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 1-20. Dungeness NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Dungeness NWR	$443.1	$2,435.1	$1,360.9	$8.57

Hakalau Forest National Wildlife Refuge

Description

Hakalau Forest National Wildlife Refuge consists of the 33,000-acre Hakalau Forest Unit and the 5,300 acre Kona Forest Unit, located at elevations between 2,000 and 6,600 feet on the east and west sides of the island of Hawaii. The sloping terrain is forested with some of the finest remaining stands of native montane rainforest in Hawaii.

The refuge was established to conserve endangered forest birds and their habitat. Together, the two units support 9 endangered bird species, 1 species of endangered bat, and more than 20 rare and endangered plant species.

Major habitat management programs include the control and removal of feral pigs and cattle, control of invasive weeds, restoration of native forests, and wildfire suppression. Major wildlife management programs include population monitoring, predator control, and biological research support.

Area Economy

Hakalau Forest NWR is located on the island of Hawaii in the state of Hawaii. Table 1-21 shows a summary of the island economy. The county population increased by 18.5 percent from 1995 to 2005, compared with a 6.4 percent increase for the state of Hawaii and a 11.4 percent increase for the U.S. as a whole. Island employment increased by 30.5 percent from 1995 to 2005, with the state of Hawaii showing a 12.9 percent increase and the U.S. a 17.0 percent increase. Island per capita income increased by 10.9 percent over the 1995-2005 period, while the state of Hawaii and the U.S. increased by 4.5 and 13.2 percent respectively.

Table 1-21. Hakalau Forest NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 2005-2005
Hawaii HI	166.5	18.5%	92.4	30.5%	$26,591	10.9%
Hawaii	1,273.3	6.4 %	835.4	12.9 %	$34,489	4.5 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 1-22 shows the recreation visits for Hakalau Forest NWR. The Refuge had 1,323 visits in 2006. All of the visits were for non-consumptive recreation with non-residents accounting for 70 percent of all visits.

Table 1-22. Hakalau Forest NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	0	0	0
Observation Platforms	0	0	0
Birding	152	354	506
Other Wildlife Observation	245	572	817
Beach /Water Use	0	0	0
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	***397***	***926***	***1,323***

Regional Economic Analysis

The economic area for the Refuge is the island of Hawaii. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 1-23. Total expenditures were $56,400 with non-residents accounting for $50,500 or 90 percent of total expenditures. Expenditures on non-consumptive activities accounted for 100 percent of all expenditures.

Table 1-23. Hakalau Forest NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$2.3	$19.3	$21.6
Other Non-Consumptive	$3.7	$31.2	$34.8
Total Non-Consumptive	$5.9	$50.5	$56.4
Hunting:			
Big Game	—	—	—
Small Game	—	—	—
Migratory Birds	—	—	—
Total Hunting	—	—	—
Fishing:			
Freshwater	—	—	—
Saltwater	—	—	—
Total Fishing	—	—	—
Total Expenditures	***$5.9***	***$50.5***	***$56.4***

Table 1-24 summarizes the local economic effects associated with recreation visits. Final demand totaled $59,400 with associated employment of 1 job, $22,000 in employment income and $8,000 in total tax revenue.

Table 1-24. Hakalau Forest NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$6.4	$53.0	$59.4
Jobs	0	1	1
Job Income	$2.7	$19.3	$22.0
Total Tax Revenue	$0.9	$7.1	$8.0

Table 1-25 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $0.08 means that for every $1 of budget expenditures, $0.08 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 1-25. Hakalau Forest NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Hakalau Forest NWR	$1,028.2	$56.4	$30.0	$0.08

Kilauea Point National Wildlife Refuge

Description

Kilauea Point National Wildlife Refuge's rocky cliffs provide premier nesting and roosting habitat for seven native Hawaiian seabirds. It is one of the most important seabird nesting sites in the inhabited Hawaiian Islands. Reintroduction of the endangered nene (Hawaiian goose) began on the refuge in 1991 as part of a statewide recovery program.

Predator control and a predator proof fence line around the perimeter of the refuge are necessary to protect breeding seabirds and nene. Native plant restoration has been ongoing since the refuge was established in 1985. Habitat management also includes opening and maintaining nesting areas for the recently colonizing Laysan albatross and improving feeding habitat for nene.

Area Economy

Kilauea Point NWR is located on the northern coast of the island of Kauai in the state of Hawaii. Table 1-26 shows the island economy. The island population increased by 9.3 percent from 1995 to 2005, compared with a 6.4 percent increase for the state of Hawaii and a 11.4 percent increase for the U.S. as a whole. Island employment increased by 25.4 percent from 1995 to 2005, with the state of Hawaii showing a 12.9 percent increase and the U.S. a 17.0 percent increase. Island per capita income increased by 2.6 percent over the 1995-2005 period, while the state of Hawaii and the U.S. increased by 4.5 and 13.2 percent respectively.

Table 1-26. Kilauea Point NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Kauai HI	62.4	9.3%	42.0	25.4%	$29,101	2.6%
Hawaii	1,273.3	6.4 %	835.4	12.9 %	$34,489	4.5 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 1-27 shows the recreation visits for Kilauea Point NWR. The Refuge had 986,088 visits in 2006. Almost all of the visits were for non-consumptive recreation with non-residents accounting for 97 percent of total Refuge visits.

Table 1-27. Kilauea Point NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	0	0	0
Observation Platforms	5,588	174,672	180,260
Wildlife Observation	12,085	390,754	402,839
Beach /Water Use	0	0	0
Other Recreation	12,085	390,754	402,839
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	0	0	0
Saltwater	149	2	150
Total Visitation	***29,907***	***956,181***	***986,088***

Regional Economic Analysis

The economic area for the Refuge is the island of Kauai in the state of Hawaii. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2006 are shown in Table 1-28. Total expenditures were $10.7 million with non-residents accounting for $10.6 million. Expenditures on non-consumptive activities accounted for almost all visitor expenditures with saltwater fishing accounting for $3,900.

Table 1-28. Kilauea Point NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:	$90.3	$10,644.8	$10,735.1
Hunting:			
Big Game	–	–	–
Small Game	–	–	–
Migratory Birds	–	–	–
Total Hunting	–	–	–
Fishing:	–	–	–
Freshwater	–	–	–
Saltwater	$3.8	$0.1	$3.9
Total Fishing	$3.8	$0.1	$3.9
Total Expenditures	***$94.1***	***$10,644.9***	***$10,739.0***

Table 1-29 summarizes the local economic effects associated with recreation visits. Final demand totaled $10.4 million with associated employment of 142 jobs, $4.1 million in employment income and $2.2 million in total tax revenue.

Table 1-29. Kilauea Point NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$94.7	$10,310.3	$10,405.0
Jobs	1	141	142
Job Income	$43.1	$4,095.4	$4,138.5
Total Tax Revenue	$21.5	$2,184.9	$2,206.4

Table 1-30 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $16.12 means that for every $1 of budget expenditures, $16.12 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 1-30. Kilauea Point NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Kilauea Point NWR	$950.0	$10,739.0	$4,570.7	$16.12

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 1-31 shows the area economy. The county population decreased by 4.9 percent from 1995 to 2005, compared with a 14.3 percent increase for the state of Oregon and a 11.4 percent increase for the U.S. as a whole. County employment increased by13.2 percent from 1995 to 2005, with the state of Oregon showing a 20.2 percent increase and the U.S. a 17.0 percent increase. Per capita income in Haney County increased by 18.3 percent over the 1995-2005 period, while the state of Oregon and the U.S. increased by 9.7 and 13.2 percent respectively.

Table 1-31. Malheur NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Harney OR	6.9	-4.9%	4.5	13.2%	$26,620	18.3%
Oregon	3,638.9	14.3 %	2,232.7	20.2 %	$32,289	9.7 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 1-32 shows the recreation visits for Malheur NWR. The Refuge had 63,000 visits in 2006. Visitors enjoyed a variety of non-consumptive activities, hunting, and freshwater fishing.

Table 1-32. Malheur NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	432	6,768	7,200
Observation Platforms	0	0	0
Birding	900	14,100	15,000
Other Wildlife Observation	612	9,588	10,200
Beach /Water Use	0	0	0
Other Recreation	1,656	25,944	27,600
Hunting:			
Big Game	0	0	0
Small Game	45	705	750
Migratory Birds	14	226	240
Fishing:			
Freshwater	121	1,889	2,010
Saltwater	0	0	0
Total Visitation	***3,780***	***59,220***	***63,000***

Regional Economic Analysis

The economic area for the Refuge is Haney County, Oregon. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 1-33. Total expenditures were $6.5 million with non-residents accounting for $6.4 million or 98 percent of total expenditures.

Table 1-33. Malheur NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$26.9	$1,536.4	$1,563.3
Other Non-Consumptive	$80.7	$4,609.3	$4,690.0
Total Non-Consumptive	$107.6	$6,145.7	$6,253.3
Hunting:			
Big Game	—	—	—
Small Game	$1.6	$108.9	$110.6
Migratory Birds	$0.7	$39.0	$39.7
Total Hunting	$2.4	$147.9	$150.3
Fishing:			
Freshwater	$4.4	$111.7	$116.1
Saltwater	—	—	—
Total Fishing	$4.4	$111.7	$116.1
Total Expenditures	***$114.4***	***$6,405.3***	***$6,519.7***

Table 1-34 summarizes the local economic effects associated with recreation visits. Final demand totaled $4.4 million with associated employment of 104 jobs, $1.7 million in employment income and $578,000 in total tax revenue.

Table 1-34. Malheur NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$83.6	$4,289.1	$4,372.7
Jobs	3	101	104
Job Income	$38.9	$1,706.3	$1,745.2
Total Tax Revenue	$11.2	$566.8	$578.0

Table 1-35 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $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.

Table 1-35. Malheur NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Malheur NWR	$1,650.0	$6,519.7	$2,872.6	$5.69

McNary National Wildlife Refuge

Description

Few areas in North America support waterfowl populations in the extraordinary numbers found within McNary National Wildlife Refuge. Visitors enjoy spectacular concentrations of Canada geese, mallards, and other waterfowl. More than half the mallards in the Pacific Flyway overwinter at some time in this portion of the Columbia River Basin. The refuge's location, close to the Tri-Cities, Washington, and major State and Federal highways, makes it easily accessible to local folks and travelers.

The refuge encompasses over 15,000 acres of backwater sloughs, shrub-steppe uplands, irrigated farmlands, river islands, delta mudflats, and riparian areas. Particularly important to Canada geese, mallards, and wigeons, as well as shorebirds and wading birds, the refuge also includes wetlands and shoreline bays that serve as an important nursery for developing fall chinook salmon. Other waterfowl species using the refuge include green-winged teal, shoveler, canvasback, ring-necked, and lesser scaup ducks. Rare and endangered birds, including bald eagles and peregrine falcons, are found here, as are thousands of colonial nesting water birds using river islands for safe nesting.

Area Economy

McNary NWR is located in southeastern Washington on the Columbia River. Table 1-36 shows the area economy. The area population increased by 17.1 percent from 1995 to 2005, compared with a 14.8 percent increase for the state of Washington and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 17.7 percent from 1995 to 2005, with the state of Washington showing a 19.5 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by 1.8 percent over the 1995-2005 period, while the state of Washington and the U.S. increased by 13.5 and 13.2 percent respectively.

Table 1-36. McNary NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Franklin WA	63.0	37.6%	29.2	21.6%	$20,573	-7.6%
Walla Walla WA	57.5	6.9%	33.5	13.7%	$24,982	5.6%
Umatilla OR	72.8	11.2%	39.7	18.4%	$25,322	6.8%
Area Total	**193.3**	**17.1%**	**102.4**	**17.7%**	**$23,626**	**1.8%**
Washington	6,291.9	14.8 %	3,733.4	19.5 %	$35,478	13.5 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 1-37 shows the recreation visits for McNary NWR. The Refuge had 58,210 visits in 2006. Non-consumptive recreation accounted for 30,300 visits, or 52 percent of all visits. Fishing accounted for 15,500 visits or 27 percent of all visits and hunting accounted for 12,360 visits or 21 percent of Refuge visits. Residents accounted for 84 percent of all Refuge visits.

Table 1-37. McNary NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	2,700	300	3,000
Observation Platforms	1,900	100	2,000
Birding	13,950	1,550	15,500
Other Wildlife Observation	1,620	180	1,800
Beach /Water Use	6,370	130	6,500
Other Recreation	1,470	30	1,500
Hunting:			
Big Game	210	0	210
Small Game	1,120	280	1,400
Migratory Birds	8,600	2,150	10,750
Fishing:			
Freshwater	10,885	4,665	15,550
Saltwater	0	0	0
Total Visitation	***48,825***	***9,385***	***58,210***

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 2006 are shown in Table 1-38. Total expenditures were $1.3 million with residents accounting for $817,600 or 63 percent of total expenditures. Non-resident expenditures were $504,300 or 37 percent of visitation expenditures. Expenditures on hunting activities accounted for 42 percent of all expenditures, followed by fishing and non-consumptive activities at 32 and 26 percent respectively.

Table 1-38. McNary NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$156.4	$63.3	$219.7
Other Non-Consumptive	$116.6	$14.8	$131.5
Total Non-Consumptive	$273.0	$78.2	$351.2
Hunting:			
Big Game	$7.7	$0.0	$7.7
Small Game	$20.3	$21.6	$42.0
Migratory Birds	$267.7	$232.1	$499.8
Total Hunting	$295.8	$253.7	$549.5
Fishing:			
Freshwater	$248.8	$172.4	$421.2
Saltwater	–	–	–
Total Fishing	$248.8	$172.4	$421.2
Total Expenditures	***$817.6***	***$504.3***	***$1,321.9***

Table 1-39 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.2 million with associated employment of 22 jobs, $518,000 in employment income and $171,600 in total tax revenue.

Table 1-39. McNary NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$777.3	$459.6	$1,236.9
Jobs	15	7	22
Job Income	$340.3	$177.7	$518.0
Total Tax Revenue	$109.6	$61.9	$171.6

Table 1-40 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $2.70 means that for every $1 of budget expenditures, $2.70 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 1-40. McNary NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
McNary NWR	$978.9	$1,321.9	$1,320.8	$2.70

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 275 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, and habitat for a variety of threatened and endangered species. The Black River Unit, southwest of Olympia, provides high quality habitat for Coho and Chinook salmon, steelhead 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 160,000 people who come to enjoy and learn about these sensitive natural resources. The refuge provides environmental education programs for 5,000 school children every year.

Area Economy

Nisqually NWR is located on the southern area of the Puget Sound near Olympia Washington. Table 1-41 shows the area economy. The area population increased by 16.8 percent from 1995 to 2005, compared with a 14.8 percent increase for the state of Washington and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 22.2 percent from 1995 to 2005, with the state of Washington showing a19.5 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by 15.6 percent over the 1995-2005 period, while the state of Washington and the U.S. increased by 13.5 and 13.2 percent respectively.

Table 1-41. Nisqually NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Pierce WA	753.2	16.1%	367.5	20.8%	$32,448	16.1%
Thurston WA	228.9	19.2%	124.7	26.5%	$33,745	15.2%
Area Total	**982.1**	**16.8%**	**492.1**	**22.2%**	**$33,097**	**15.6%**
Washington	6,291.9	14.8 %	3,733.4	19.5 %	$35,478	13.5 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 1-42 shows the recreation visits for Nisqually NWR. The Refuge had 149,515 visits in 2006. Almost all of the visits were for non-consumptive recreation, with residents accounting for 70 percent.

Table 1-42. Nisqually NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	98,065	42,028	140,093
Observation Platforms	0	0	0
Birding	0	0	0
Other Wildlife Observation	0	0	0
Beach /Water Use	0	0	0
Other Recreation	3,972	1,702	5,674
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	0	0	0
Saltwater	2,624	1,124	3,748
Total Visitation	***104,661***	***44,855***	***149,515***

Regional Economic Analysis

The economic area for the Refuge is consists of Pierce and Thurston Counties in Washington. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 1-43. Total expenditures were $2.3 million with non-residents accounting for $1.4 million. Expenditures on non-consumptive activities accounted for 88 percent of all expenditures, with fishing accounting for 12 percent.

Table 1-43. Nisqually NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	—		—
Other Non-Consumptive	$777.3	$1,214.5	$1,991.8
Total Non-Consumptive	$777.3	$1,214.5	$1,991.8
Hunting:			
Big Game	—		—
Small Game	—		—
Migratory Birds	—		—
Total Hunting	—		—
Fishing:			
Freshwater	—		—
Saltwater	$110.9	$157.1	$268.0
Total Fishing	$110.9	$157.1	$268.0
Total Expenditures	***$888.2***	***$1,371.5***	***$2,259.8***

Table 1-44 summarizes the local economic effects associated with recreation visits. Final demand totaled $2.8 million with associated employment of 40 jobs, $1.1 million in employment income and $356,100 in total tax revenue.

Table 1-44. Nisqually NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$1,123.6	$1,717.8	$2,841.4
Jobs	18	22	40
Job Income	$484.0	$653.9	$1,137.9
Total Tax Revenue	$144.1	$212.0	$356.1

Table 1-45 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $3.95 means that for every $1 of budget expenditures, $3.95 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. Nisqually NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Nisqually NWR	$1,028.00	$2,259.8	$1,803.3	$3.95

Ridgefield National Wildlife Refuge

Description

Ridgefield National Wildlife Refuge is located on the shore of the Lower Columbia River, 10 miles downstream from the Portland/Vancouver metropolitan area. This 5,217 acre refuge contains a mosaic of riverine flood plain habitat, intensively managed seasonal and permanent wetlands, and agricultural lands.

The refuge contains the historic Cathlapotle townsite, which was visited by the Lewis and Clark expedition in 1806, and today is one of the best-preserved Native American sites in the Northwest United States. Ridgefield NWR provides high quality wintering habitat for a variety of waterfowl, particularly dusky Canada goose and lesser sandhill cranes.

Currently hosting approximately 140,000 visitors annually, the refuge provides excellent wildlife viewing opportunities via a 4-mile auto tour route and two developed hiking trails. It also provides excellent outdoor classroom opportunities for Portland/Vancouver area schools, including natural resource, cultural, and historic information.

Area Economy

Ridgefield NWR is located on the Columbia River in southwestern Washington. Table 1-46 shows the counties making up the area economy. The area population increased by 19.9 percent from 1995 to 2005, compared with a 14.3 percent increase for the state of Oregon and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 21.1 percent from 1995 to 2005, with the state of Oregon showing a 20.2 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by 7.7 percent over the 1995-2005 period, while the state of Oregon and the U.S. increased by13.5 and 13.2 percent respectively.

Table 1-46. Ridgefield NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Clackamas OR	368.3	16.9%	216.1	37.9%	$39,729	12.7%
Multnomah OR	672.9	6.9%	556.9	9.7%	$37,798	13.1%
Washington OR	500.7	30.3%	284.4	28.1%	$34,626	0.2%
Clark WA	404.1	37.1%	177.8	33.1%	$31,098	4.5%
Area Total	**1,946.0**	**19.9%**	**1,235.2**	**21.1%**	**$35,813**	**7.7%**
Oregon	3,638.9	14.3%	3,733.4	19.5 %	$35,478	13.5 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 1-47 shows the recreation visits for Ridgefield NWR. The Refuge had 178,115 visits in 2006. The vast majority of visits were for non-consumptive activities. Residents accounted for 66 percent of all Refuge visitation.

Table 1-47. Ridgefield NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	23,100	11,900	35,000
Observation Platforms	21,516	11,084	32,600
Birding	66,132	34,068	100,200
Other Wildlife Observation	0	0	0
Beach /Water Use	0	0	0
Other Recreation	5,280	2,720	8,000
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	2,034	21	2,055
Fishing:			
Freshwater	260	0	260
Saltwater	0	0	0
Total Visitation	***118,322***	***59,793***	***178,115***

Regional Economic Analysis

The economic area for the Refuge is Clark County Washington and Multnomah, Clackamas and Washington Counties in Oregon. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 1-48. Total expenditures were $2.3 million with non-residents accounting for $1.4 million or 64 percent of total expenditures. Expenditures on non-consumptive activities accounted for 98 percent of all expenditures.

Table 1-48. Ridgefield NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$494.2	$928.1	$1,422.3
Other Non-Consumptive	$272.7	$512.2	$784.9
Total Non-Consumptive	$766.9	$1,440.3	$2,207.2
Hunting:			
Big Game	–	–	–
Small Game	–	–	–
Migratory Birds	$50.7	$1.8	$52.4
Total Hunting	$50.7	$1.8	$52.4
Fishing:			
Freshwater	$2.4	–	$2.4
Saltwater	–	–	–
Total Fishing	$2.4	–	$2.4
Total Expenditures	***$820.0***	***$1,442.0***	***$2,262.0***

Table 1-49 summarizes the local economic effects associated with recreation visits. Final demand totaled $2.9 million with associated employment of 36 jobs, $1.1 in employment income and 417,200 in total tax revenue.

Table 1-49. Ridgefield NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$1,048.4	$1,833.0	$2,881.4
Jobs	15	21	36
Job Income	$445.3	$688.1	$1,133.4
Total Tax Revenue	$155.8	$261.4	$417.2

Table 1-50 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $4.25 means that for every $1 of budget expenditures, $4.25 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 1-50. Ridgefield NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Ridgefield NWR	$960.6	$2,262.0	$1,818.1	$4.25

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 an unusual pattern of wetlands, rock, ponderosa pine and aspen forests, grassland, and shrub-steppe habitat. Located within the Pacific Flyway, the 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 have been recorded in this area.

Mammals include elk, mule and white-tailed deer, coyote, badger, porcupine, muskrat, beaver, and 10 species of bats. The refuge provides habitat for two species Federally listed as endangered or threatened--water howellia and bald eagle.

Area Economy

Turnbull NWR is located in northeastern Washington in Spokane County. Table 1-51 shows the area economy. The county population increased by 8.8 percent from 1995 to 2005, compared with a 14.8 percent increase for the state of Washington and a 11.4 percent increase for the U.S. as a whole. County employment increased by 14.9 percent from 1995 to 2005, with the state of Washington showing a 19.5 percent increase and the U.S. a 17.0 percent increase. Per capita income in Spokane County increased by 9.6 percent over the 1995-2005 period, while the state of Washington and the U.S. increased by13.5 and 13.2 percent respectively.

Table 1-51. Turnbull NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Spokane WA	440.4	8.8%	263.0	14.9%	$29,203	9.6%
Washington	6,291.9	14.8 %	3,733.4	19.5 %	$35,478	13.5 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 1-52 shows the recreation visits for Turnbull NWR. The Refuge had 66,000 visits in 2006. All of the visits were for non-consumptive recreation with residents accounting for 70 percent of all Refuge visits.

Table 1-52. Turnbull NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	17,500	7,500	25,000
Observation Platforms	0	0	0
Birding	13,300	5,700	19,000
Other Wildlife Observation	14,000	6,000	20,000
Beach /Water Use	0	0	0
Other Recreation	1,400	600	2,000
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	***46,200***	***19,800***	***66,000***

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 1-53. Total expenditures were $1.1 million with non-residents accounting for $649,700 or 61 percent of total expenditures. Expenditures on non-consumptive activities accounted for all Refuge visitation expenditures.

Table 1-54 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.3 million with associated employment of 18 jobs, $500,400 in employment income and $168,700 in total tax revenue.

Table 1-53. Turnbull NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$99.4	$155.3	$254.7
Other Non-Consumptive	$316.5	$494.4	$810.9
Total Non-Consumptive	$415.9	$649.7	$1,065.6
Hunting:			
Big Game	–	–	–
Small Game	–	–	–
Migratory Birds	–	–	–
Total Hunting	–	–	–
Fishing:	–	–	–
Freshwater	–	–	–
Saltwater	–	–	–
Total Fishing	–	–	–
Total Expenditures	***$415.9***	***$649.7***	***$1,065.6***

Table 1-54. Turnbull NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$502.2	$763.9	$1,266.1
Jobs	8	10	18
Job Income	$215.2	$285.2	$500.4
Total Tax Revenue	$69.0	$99.8	$168.7

Table 1-55 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $1.15 means that for every $1 of budget expenditures, $1.15 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 1-55. Turnbull NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Turnbull NWR	$1,707.6	$1,065.6	$901.5	$1.15

Umatilla National Wildlife Refuge

Description

The Umatilla National Wildlife Refuge consists of approximately 23,000 acres of upland, marsh, and open water along the Columbia River between Irrigon, Oregon, and Crow Butte State Park, Washington. The refuge was officially established on July 3, 1969, to mitigate the loss of flooding of wildlife habitat caused by the construction of the John Day Lock and Dam by the U.S. Army Corps of Engineers. Dam construction raised the level of the river 25 feet, creating Lake Umatilla between the John Day and McNary dams.

The refuge is divided into 6 units, 2 in Oregon, 3 in Washington, and 1 in mid-river. Portions of the McCormack and Whitcomb Island units are cooperatively farmed; the other units are managed as wildlands.

Umatilla NWR is intensively managed to meet its wildlife objectives: producing Great Basin Canada geese during spring and fall migrations, and providing habitat for other migratory birds. Waterfowl populations peak in mid to late November, when 200,000 mallards and 33,000 Canada geese visit the refuge.

Area Economy

Umatilla NWR is located in southeastern Washington on the Columbia River. Table 1-56 shows the area economy. The area increased by 17.9 percent from 1995 to 2005, compared with a 14.3 percent increase for the state of Oregon and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 17.8 percent from 1995 to 2005, with the state of Oregon showing a 20.2 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by 10.8 percent over the 1995-2005 period, while the state of Oregon and the U.S. increased by 9.7 and 13.2 percent respectively.

Table 1-56. Umatilla NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Benton WA	157.9	17.2%	88.2	17.8%	$31,433	6.3%
Morrow OR	11.6	28.2%	5.6	18.3%	$25,108	17.0%
Area Total	**169.6**	**17.9%**	**93.8**	**17.8%**	**$28,271**	**10.8%**
Oregon	3,638.9	14.3 %	2,232.7	20.2 %	$32,289	9.7 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 1-57 shows the recreation visits for Umatilla NWR. The Refuge had 75,748 visits in 2006. Non-consumptive recreation accounted for 36,000 visits, hunting 15,748 and fishing 24,000. Residents accounted for 70 percent of all Refuge visits.

Table 1-57. Umatilla NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	2,850	150	3,000
Observation Platforms	2,850	150	3,000
Birding	19,000	1,000	20,000
Other Wildlife Observation	6,175	325	6,500
Beach /Water Use	2,850	150	3,000
Other Recreation	475	25	500
Hunting:			
Big Game	48	0	48
Small Game	1,838	788	2,625
Migratory Birds	2,615	10,460	13,075
Fishing:			
Freshwater	14,400	9,600	24,000
Saltwater	0	0	0
Total Visitation	***53,101***	***22,648***	***75,748***

Regional Economic Analysis

The economic area for the Refuge is Benton County, Washington and Morrow County, Oregon. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 1-58. Total expenditures were $2.3 million with non-residents accounting for $1.6 or 70 percent of total expenditures. Expenditures on hunting activities accounted for 58 percent of all expenditures, followed by fishing and non-consumptive activities at 30 and 12 percent respectively.

Table 1-58. Umatilla NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$142.0	$27.2	$169.2
Other Non-Consumptive	$88.7	$17.0	$105.8
Total Non-Consumptive	$230.7	$44.3	$275.0
Hunting:			
Big Game	$1.8	$0.0	$1.8
Small Game	$33.4	$60.8	$94.2
Migratory Birds	$81.4	$1,129.2	$1,210.6
Total Hunting	$116.5	$1,190.0	$1,306.5
Fishing:			
Freshwater	$329.2	$354.8	$683.9
Saltwater	–	–	–
Total Fishing	$329.2	$354.8	$683.9
Total Expenditures	***$676.4***	***$1,589.0***	***$2,265.5***

Table 1-59 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.8 with associated employment of 18 jobs, $769,200 in employment income and $251,800 in total tax revenue.

Table 1-59. Umatilla NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$597.9	$1,205.8	$1,803.7
Jobs	11	18	29
Job Income	$277.6	$491.6	$769.2
Total Tax Revenue	$85.4	$166.3	$251.8

Table 1-60 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $3.95 means that for every $1 of budget expenditures, $3.95 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. Umatilla NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Umatilla NWR	$978.9	$2,265.5	$1,604.9	$3.95

William Finley National Wildlife Refuge

Description

William L. Finley National Wildlife Refuge was created to provide vital wintering habitat for dusky Canada geese. Unlike other Canada geese, duskies have limited summer and winter ranges. They nest on Alaska's Copper River Delta, and winter almost exclusively in the Willamette Valley.

Habitat loss, predation, and hunting have caused a decrease in population. Located in the Willamette Valley, the refuge protects many of the valley's historic habitats, including the largest remaining tract of native Willamette Valley wet prairie. Fields of wildlife food crops are interspersed with Oregon white oak savannah, meandering creeks with bottomland Oregon ash forest, old growth big-leaf maple, and native prairie.

Other management goals are to preserve native species and enhance biodiversity. Endangered and threatened species such as peregrine falcons, bald eagles, Oregon chub, and Bradshaw's desert parsley find protection and sanctuary on the refuge. A herd of Roosevelt elk can be found in the bottomland forests or farm fields on the refuge.

Of historic interest is the Fiechter House, completed in 1857, and thought to be the oldest house in Benton County. The refuge was named for William L. Finley, an early conservationist who persuaded President Theodore Roosevelt to set aside the first national wildlife refuge west of the Mississippi River.

Area Economy

William Finley NWR is located in west central Oregon south of the city of Corvallis. Table 1-61 shows the area economy. The county population increased by 2.7 percent from 1995 to 2005, compared with a 14.3 percent increase for the state of Oregon and a 11.4 percent increase for the U.S. as a whole. County employment increased by 21.5 percent from 1995 to 2005, with the state of Oregon showing a 20.2 percent increase and the U.S. a 17.0 percent increase. County per capita income increased by 24 percent over the 1995-2005 period, while the state of Oregon and the U.S. increased by 9.7 and 13.2 percent respectively.

Table 1-61. William Finley NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Benton, OR	78.6	2.7%	55.0	21.5%	$36,685	24.0%
Oregon	3,638.9	14.3 %	2,232.7	20.2 %	$32,289	9.7 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 1-62 shows the recreation visits for William Finley NWR. The Refuge had 120,933 visits in 2006. Almost all of the visits were for non-consumptive recreation, with the majority of visits by residents (80 percent).

Table 1-62. William Finley NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	20,414	5,104	25,518
Observation Platforms	11,917	2,979	14,896
Birding	56,000	14,000	70,000
Other Wildlife Observation	8,330	2,083	10,413
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	105	0	105
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	1	0	1
Saltwater	0	0	0
Total Visitation	***96,768***	***24,165***	***120,933***

Regional Economic Analysis

The economic area for the Refuge is Benton County in Oregon. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 1-63. Total expenditures were $1.4 million with non-residents accounting for $687,200 or 48 percent of total expenditures. Expenditures on non-consumptive activities accounted for 99 percent of all expenditures.

Table 1-63. William Finley NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$418.5	$381.4	$799.9
Other Non-Consumptive	$335.6	$305.9	$641.5
Total Non-Consumptive	$754.1	$687.2	$1,441.3
Hunting:			
Big Game	$1.5	$0.0	$1.5
Small Game	—	—	—
Migratory Birds	—	—	—
Total Hunting	$1.5	$0.0	$1.5
Fishing:			
Freshwater	—	—	—
Saltwater	—	—	—
Total Fishing	—	—	—
Total Expenditures	***$755.5***	***$687.2***	***$1,442.8***

Table 1-64 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.5 million with associated employment of 22 jobs, $488,700 in employment income and $238,000 in total tax revenue.

Table 1-64. William Finley NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$785.3	$674.7	$1,460.1
Jobs	12	10	22
Job Income	$262.2	$226.6	$488.7
Total Tax Revenue	$126.2	$111.8	$238.0

Table 1-65 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $1.47 means that for every $1 of budget expenditures, $1.47 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 1-65. William Finley NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
William Finley NWR	$1,960.1	$1,442.8	$1,432.3	$1.47

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:

Balcones Canyonlands NWR (Texas)
Bill Williams NWR (Arizona)
Bitter Lake NWR (New Mexico)
Buffalo Lake NWR (Texas)
Cibola NWR (Arizona)
Kofa NWR (Arizona)
Maxwell NWR (New Mexico)
Santa Ana NWR (Texas)
Sequoyah NWR (Oklahoma)
Tishomingo NWR (Oklahoma)
Washita NWR (Oklahoma)

Balcones Canyonlands National Wildlife Refuge

Description

The primary purpose of the Refuge is to conserve the nesting habitat of the endangered Golden-cheeked Warbler and Black-capped Vireo. The vegetation found in this area, known as the Texas Hill Country, includes various oaks, elm, and Ashe juniper trees (commonly called cedar). The Golden-cheeked Warbler and Black-capped Vireo depend on different successional stages of this vegetation. Both of these birds nest in central Texas, the warbler exclusively

The Edwards Plateau of central and West-Central Texas is an elevated expanse of land over 35,000 square miles in area. It is bordered on the south and east by the Balcones Escarpment, also known as Balcones Canyonlands or as the Texas Hill Country. This deeply dissected region of the Plateau contains many steep-banked streams and canyons.

Beneath the surface of the Plateau lies the karst habitat, an underground honeycomb of caves, sinkholes and springs. Various spiders, beetles, and other creatures inhabit this below-ground world and are unique to this area of Texas. Even deeper below the surface lies the Edwards Aquifer, which stores billions of gallons of water that supply drinking water for the almost one million people in San Antonio area. The aquifer is also the source of many Central Texas springs and the many beautiful Hill Country rivers, which eventually flow into the marshes, estuaries, and bays along the Texas coast. Protection of the springs is vital to the plants and animals that depend on the purity of the water.

The vegetation found in the Hill Country includes various oaks, elms, and Ashe juniper trees (called cedar in Texas). The endangered Golden-cheeked Warbler and Black-capped Vireo depend of different successional stages of this vegetation. Both of these birds nest in the Edwards Plateau, the Warbler exclusively.

The more than 525 plant species include the Texabama Croton, discovered here only in 1989. At least a third of the state's threatened and endangered species live or move through the area.

Area Economy

Balcones Canyonlands NWR is located in central Texas northwest of the city of Austin. Table 2-1 shows the area economy. The area population increased by 39.8 percent from 1995 to 2005, compared with a 20.9 percent increase for the state of Texas and a 11.4 percent increase for the U.S. as a whole. Area employment increased by38.7 percent from 1995 to 2005, with the state of Texas showing a 24.6 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by 15.1 percent over the 1995-2005 period, while the state of Texas and the U.S. increased by 17.1 and 13.2 percent respectively.

Table 2-1. Balcones Canyonlands NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Burnet TX	41.5	51.4%	23.9	72.2%	$29,262	13.2%
Travis TX	889.5	27.8%	698.5	30.0%	$37,972	20.8%
Williams TX	334.4	84.1%	136.1	99.8%	$31,933	10.5%
Area Total	**1,265.4**	**39.8%**	**858.5**	**38.7%**	**$33,056**	**15.1%**
Texas	22,928.5	20.9 %	13,088.9	24.6 %	$32,460	17.1 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 2-2 shows the recreation visits for Balcones Canyonlands NWR. The Refuge had 27,551 visits in 2006. Almost all of the visits were for non-consumptive recreation. Residents accounted for 15,522 visits and non-residents accounted for 12,029 visits.

Table 2-2. Balcones Canyonlands NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	6,007	2,574	8,581
Observation Platforms	2,510	3,765	6,275
Birding	3,744	2,496	6,240
Other Wildlife Observation	1,663	2,495	4,158
Beach /Water Use	0	0	0
Other Recreation	1,366	585	1,951
Hunting:			
Big Game	205	111	316
Small Game	0	0	0
Migratory Birds	27	3	30
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	***15,522***	***12,029***	***27,551***

Regional Economic Analysis

The economic area for the Refuge is Burnet, Travis and Williams Counties in Texas. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 2-3 . Total expenditures were $500,200 with non-residents accounting for $385,700 or 77 percent of total expenditures. Expenditures on non-consumptive activities accounted for 94 percent of all expenditures.

Table 2-3. Balcones Canyonlands NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$32.3	$104.6	$136.9
Other Non-Consumptive	$71.7	$261.8	$333.5
Total Non-Consumptive	$104.0	$366.4	$470.4
Hunting:			
Big Game	$10.0	$19.1	$29.1
Small Game	–	–	–
Migratory Birds	$0.6	$0.1	$0.7
Total Hunting	$10.6	$19.2	$29.8
Fishing:			
Freshwater	–	–	–
Saltwater	–	–	–
Total Fishing	–	–	–
Total Expenditures	***$114.5***	***$385.7***	***$500.2***

Table 2-4 summarizes the local economic effects associated with recreation visits. Final demand totaled $555,800 with associated employment of 7 jobs, $213,300 in employment income and $68,600 in total tax revenue.

Table 2-4. Balcones Canyonlands NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$124.9	$430.8	$555.8
Jobs	2	5	7
Job Income	$55.7	$157.6	$213.3
Total Tax Revenue	$16.1	$52.5	$68.6

Table 2-5 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $0.89 means that for every $1 of budget expenditures, $0.89 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 2-5. Balcones Canyonlands NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Balcones Canyonlands NWR	$975.0	$500.2	$370.6	$0.89

Bill Williams National Wildlife Refuge

Description

This 6,105-acre refuge holds one of the last stands of natural cottonwood-willow forests along the lower Colorado River, creating a unique ecosystem that provides good habitat for resident and migratory wildlife. There are few places where one can stand, look at a Saguaro cactus, a cattail stand, and a cottonwood tree together. This unique blend of upland desert, marsh, and desert riparian habitats provides for a diverse array of birds, mammals, and reptiles. This diversity of wildlife includes: the southwestern willow flycatcher, vermillion flycatcher, yellow-billed cuckoo, western tanager, Lazuli bunting, Yuma clapper rail, beaver, bobcat, mountain lion, gray fox, javelina, mule deer, desert bighorn sheep, ringtailed cat, Razorback sucker and bontail chub.

Area Economy

Bill Williams NWR is located in western Arizona on the Colorado River. Table 2-6 shows the area economy. The area population increased by 40.9 percent from 1995 to 2005, compared with a 34.3 percent increase for the state of Arizona and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 52.9 percent from 1995 to 2005, with the state of Arizona showing a 42.3 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by 11 percent over the 1995-2005 period, while the state of Arizona and the U.S. increased by 14.1 and 13.2 percent respectively.

Table 2-6. Bill Williams NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Mohave AZ	186.6	43.2%	69.9	57.9%	$22,055	10.6%
La Paz AZ	20.2	22.1%	8.1	20.3%	$20,683	11.5%
Area Total	**206.8**	**40.9%**	**78.0**	**52.9%**	**$21,369**	**11.0%**
Arizona	5,953.0	34.3 %	3,237.2	42.3 %	$30,019	14.1 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 2-7 shows the recreation visits for Bill Williams NWR. The Refuge had 72,500 visits in 2006. Non-consumptive recreation accounted for 54,900 visits or 75 percent of all visits. Fishing accounted for 17,500 visits or 25 percent of all visits. Non-residents accounted for 69 percent of all visits with residents accounting for 31 percent.

Table 2-7. Bill Williams NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	5,225	15,675	20,900
Observation Platforms	0	0	0
Birding	3,125	9,375	12,500
Other Wildlife Observation	1,250	3,750	5,000
Beach /Water Use	375	1,125	1,500
Other Recreation	3,750	11,250	15,000
Hunting:			
Big Game	10	0	10
Small Game	45	5	50
Migratory Birds	36	4	40
Fishing:			
Freshwater	8,750	8,750	17,500
Saltwater	0	0	0
Total Visitation	***22,566***	***49,934***	***72,500***

Regional Economic Analysis

The economic area for the Refuge is La Paz and Mojave Counties in Arizona. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 2-8. Total expenditures were $2.4 million with non-residents accounting for $2.2 million and residents $271,300. Expenditures on non-consumptive activities accounted for 80 percent of all expenditures. Fishing accounted for 20 percent of expenditures.

Table 2-9 summarizes the local economic effects associated with recreation visits. Final demand totaled $2.3 million with associated employment of 38 jobs, $872,300 in employment income and $309,200 in total tax revenue.

Table 2-8. Bill Williams NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$35.9	$523.9	$559.8
Other Non-Consumptive	$88.2	$1,286.8	$1,375.0
Total Non-Consumptive	$124.1	$1,810.7	$1,934.8
Hunting:			
Big Game	$0.4	–	$0.4
Small Game	$0.5	$0.1	$0.6
Migratory Birds	$0.6	$0.1	$0.7
Total Hunting	$1.4	$0.2	$1.7
Fishing:			
Freshwater	$145.8	$340.8	$486.5
Saltwater	–	–	–
Total Fishing	$145.8	$340.8	$486.5
Total Expenditures	***$271.3***	***$2,151.7***	***$2,423.0***

Table 2-9. Bill Williams NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$247.9	$2,027.0	$2,274.9
Jobs	5	33	38
Job Income	$109.0	$763.4	$872.3
Total Tax Revenue	$35.2	$274.0	$309.2

Table 2-10 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $6.48 means that for every $1 of budget expenditures, $6.48 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 2-10. Bill Williams NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Bill Williams NWR	$593.6	$2,423.0	$1,423.6	$6.48

Bitter Lake National Wildlife Refuge

Description

Located where the Chihuahuan Desert meets the southern plains, Bitter Lake National Wildlife Refuge provides habitat for some of the rarest creatures in New Mexico. Established in 1937 to provide habitat for thousands of migrating sandhill cranes and waterfowl, the Refuge is becoming popular for its diverse flora and fauna.

Straddling the Pecos River, the Refuge consists of an assortment of water habitats surrounded by a harsh, dry environment. The waters support unique wildlife, such as the Pecos pupfish, Roswell spring snail, green throat darter, and Noel's amphipod, along the more than 80 species of dragonflies.

Native grasslands, sand dunes, brushy bottomlands, and re-rimmed plateaus provide a sharp contrast to the wetland habitats of the Refuge. Roadrunners, scaled quail, and horned lizards are commonly seen in these drier areas.

Area Economy

Bitter Lake NWR is located in southeastern New Mexico. Table 2-11 shows the area economy. The county population increased by 0.8 percent from 1995 to 2005, compared with a 12 percent increase for the state of New Mexico and a 11.4 percent increase for the U.S. as a whole. County employment increased by 15.7 percent from 1995 to 2005, with the state of New Mexico showing a 17.6 percent increase and the U.S. a 17.0 percent increase. County per capita income in increased by3.2 percent over the 1995-2005 period, while the state of New Mexico and the U.S. increased by 14.7 and 13.2 percent respectively.

Table 2-11. Bitter Lake NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Chaves NM	61.9	0.8%	$24,880	15.7%	29.1	3.2%
New Mexico	1,926.0	12.0 %	1064.4	17.6 %	$27,889	14.7 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 2-12 shows the recreation visits for Bitter Lake NWR. The Refuge had 71,465 visits in 2006. Almost all visits were for non-consumptive recreation with residents accounting for 67 percent of Refuge visits.

Table 2-12. Bitter Lake NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	28,000	7,000	35,000
Observation Platforms	2,400	600	3,000
Birding	15,000	15,000	30,000
Other Wildlife Observation	2,400	600	3,000
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	51	9	60
Small Game	59	7	65
Migratory Birds	238	102	340
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	***48,148***	***23,318***	***71,465***

Regional Economic Analysis

The economic area for the Refuge is Chaves County, New Mexico. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 2-13. Total expenditures were $917,100 with non-residents accounting for $643,600 or 70 percent of total expenditures. Expenditures on non-consumptive activities accounted for 99 percent of all expenditures.

Table 2-14 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.4 million with associated employment of 23 jobs, $450,200 in employment income and $205,700 in total tax revenue.

Table 2-13. Bitter Lake NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$86.1	$419.2	$505.3
Other Non-Consumptive	$181.5	$220.8	$402.2
Total Non-Consumptive	$267.6	$639.9	$907.5
Hunting:			
Big Game	$1.2	$0.8	$2.0
Small Game	$0.6	$0.1	$0.8
Migratory Birds	$3.9	$2.8	$6.7
Total Hunting	$5.8	$3.7	$9.5
Fishing:			
Freshwater	–	–	–
Saltwater	–	–	–
Total Fishing	–	–	–
Total Expenditures	***$273.4***	***$643.6***	***$917.1***

Table 2-14. Bitter Lake NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$478.2	$960.8	$1,438.9
Jobs	8	15	23
Job Income	$145.6	$304.6	$450.2
Total Tax Revenue	$65.1	$140.6	$205.7

Table 2-15 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $1.98 means that for every $1 of budget expenditures, $1.98 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. Bitter Lake NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Bitter Lake NWR	$864.7	$917.1	$797.2	$1.98

Buffalo Lake National Wildlife Refuge

Description

A valuable wintering area for migrating waterfowl, thousands of ducks and geese over-winter on Buffalo Lake National Wildlife Refuge every year. Located in Randall County in the Texas Panhandle, the refuge is made up of 7,664 acres of shortgrass prairie, riparian, marsh, woodland and cropland habitats. Maintaining these habitats provide homes for migratory and resident wildlife species.

Riparian areas, consisting of trees and grasses adjacent the dry lake bed, provide habitat used for feeding and nesting by neotropical migratory birds, deer, and numerous other wildlife species. Wildlife food crops are planted in the dry lake bottom by cooperative farming. The crops are used by wildlife for food and the mix of crops, stubble, and natural plants provide nesting and winter cover for migratory and resident wildlife.

Buffalo Lake NWR contains some of the best remaining shortgrass prairie in the United States, including 175 acres designated a National Natural Landmark. Shortgrass prairie ecosystems were historically maintained by annual grazing of migrating American bison. With the bison gone, this ecosystem is maintained by grazing cattle.

Area Economy

Buffalo Lake NWR is located in northern Texas in the Texas Panhandle. Table 2-16 shows the area economy. The area population increased by 10.1 percent from 1995 to 2005, compared with a 20.9 percent increase for the state of Texas and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 16.9 percent from 1995 to 2005, with the state of Texas showing a 24.6 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area decreased by 0.9 percent over the 1995-2005 period, while the state of Texas and the U.S. increased by 17.1 and 13.2 percent respectively.

Table 2-16. Buffalo Lake NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Potter TX	120.0	9.5%	102.9	19.4%	$26,219	10.9%
Deaf Smith TX	18.5	-3.2%	9.8	6.2%	$24,574	-14.6%
Randall TX	110.0	13.5%	37.2	13.4%	$30,369	3.0%
Area Total	**248.6**	**10.1%**	**149.9**	**16.9%**	**$27,054**	**-0.9%**
Texas	22,928.5	20.9 %	13,088.9	24.6 %	$32,460	17.1 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 2-17 shows the recreation visits for Buffalo Lake NWR. The Refuge had 8,624 visits in 2006. All of the visits were for non-consumptive recreation with residents accounting for 6,468 visits or 75 percent of total visitation.

Table 2-17. Buffalo Lake NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	2,320	773	3,093
Observation Platforms	1,886	629	2,515
Birding	1,950	650	2,600
Other Wildlife Observation	252	84	336
Beach /Water Use	0	0	0
Other Recreation	60	20	80
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	***6,468***	***2,156***	***8,624***

Regional Economic Analysis

The economic area for the Refuge is Potter, Deaf Smith, and Randall Counties in Texas. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 2-18. Total expenditures were $146,100 with non-residents accounting for $90,400 or 61 percent of total expenditures. Non-consumptive activities accounted for all visitation expenditures.

Table 2-18. Buffalo Lake NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$16.8	$27.2	$44.0
Other Non-Consumptive	$38.9	$63.1	$102.0
Total Non-Consumptive	$55.7	$90.4	$146.1
Hunting:			
Big Game	–	–	–
Small Game	–	–	–
Migratory Birds	–	–	–
Total Hunting	–	–	–
Fishing:	–	–	–
Freshwater	–	–	–
Saltwater	–	–	–
Total Fishing	–	–	–
Total Expenditures	***$55.7***	***$90.4***	***$146.1***

Table 2-19 summarizes the local economic effects associated with recreation visits. Final demand totaled $154,900 with associated employment of 3 jobs, $61,100 in employment income and $19,900 in total tax revenue.

Table 2-19. Buffalo Lake NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$58.2	$96.7	$154.9
Jobs	1	1	3
Job Income	$25.8	$35.3	$61.1
Total Tax Revenue	$7.8	$12.1	$19.9

Table 2-20 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $0.81 means that for every $1 of budget expenditures, $0.81 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. Buffalo Lake NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Buffalo Lake NWR	$362.4	$146.1	$146.7	$0.81

Cibola National Wildlife Refuge

Description

Cibola NWR is located in the floodplain of the lower Colorado River and surrounded by a fringe of desert ridges and washes. The refuge encompasses both the historic Colorado River channel as well as a channelized portion constructed in the late 1960's. Along with these main waterbodies, several important backwaters are home to many wildlife species that reside in this portion of the Sonoran Desert. Because of the river's life sustaining water, wildlife here survive in an environment that reaches 120 degrees in the summer and receives an average of only 2 inches of rain per year.

Over 288 species of birds have been found on Cibola NWR, including many species of migratory songbirds, Gambel's quail, roadrunners, mourning and white-winged doves, phainopepla, greater sandhill cranes, Canada and snow geese, Vermillion flycatchers, grosbeaks and many more. The bald eagle, southwestern willow flycatcher and Yuma clapper rail are among the endangered birds that use Cibola NWR. Other listed species include the desert tortoise, razorback sucker, bonytail chub, and desert pupfish.

Area Economy

Cibola NWR is located in western Arizona on the Colorado River. Table 2-21 shows the area economy. The area population increased by 14.7 percent from 1995 to 2005, compared with a 34.3 percent increase for the state of Arizona and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 14.9 percent from 1995 to 2005, with the state of Arizona showing a 42.3 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by 6.2 percent over the 1995-2005 period, while the state of Arizona and the U.S. increased by 14.1 and 13.2 percent respectively.

Table 2-21. Cibola NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Imperial CA	155.9	13.8%	67.2	14.2%	$21,899	1.7%
La Paz AZ	20.2	22.1%	8.1	20.3%	$20,683	11.5%
Area Total	176.1	14.7%	75.3	14.9%	$21,291	6.2%
Arizona	5,953.0	34.3 %	3,237.2	42.3 %	$30,019	14.1 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 2-22 shows the recreation visits for Cibola NWR. The Refuge had 8,450 visits in 2006. Non-consumptive recreation totaled 6,200 visits, hunting 1,650 and fishing 500. Non-residents accounted for 6,991 visits or 83 percent of total visits.

Table 2-22. Cibola NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	20	1,980	2,000
Observation Platforms	10	990	1,000
Birding	400	1,600	2,000
Other Wildlife Observation	300	700	1,000
Beach /Water Use	0	0	0
Other Recreation	2	198	200
Hunting:			
Big Game	20	180	200
Small Game	68	383	450
Migratory Birds	440	660	1,100
Fishing:			
Freshwater	200	300	500
Saltwater	0	0	0
Total Visitation	***1,460***	***6,991***	***8,450***

Regional Economic Analysis

The economic area for the Refuge is La Paz County, Arizona. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 2-23. Total expenditures were $248,000 with non-residents accounting for $223,000 or 90 percent of total expenditures. Expenditures on non-consumptive activities accounted for 59 percent of all expenditures, followed by hunting and fishing at 31 and 9 percent respectively.

Table 2-23. Cibola NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$3.5	$67.1	$70.5
Other Non-Consumptive	$2.7	$73.6	$76.3
Total Non-Consumptive	$6.2	$140. 7	$146.8
Hunting:			
Big Game	$0.7	$23.4	$24.1
Small Game	$1.0	$11.2	$12.2
Migratory Birds	$12.1	$30.3	$42.4
Total Hunting	$13.8	$64.8	$78.7
Fishing:			
Freshwater	$5.0	$17.5	$22.5
Saltwater	$0.0	$0.0	$0.0
Total Fishing	$5.0	$17.5	$22.5
Total Expenditures	***$25.0***	***$223.0***	***$248.0***

Table 2-24 summarizes the local economic effects associated with recreation visits. Final demand totaled $215,600 with associated employment of 3 jobs, $85,000 in employment income and $31,400 in total tax revenue.

Table 2-24. Cibola NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$18.8	$196.8	$215.6
Jobs	0	3	3
Job Income	$8.8	$76.2	$85.0
Total Tax Revenue	$2.9	$28.5	$31.4

Table 2-25 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $0.49 means that for every $1 of budget expenditures, $0.49 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. Cibola NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Cibola NWR	$795.0	$248.0	$141.5	$0.49

Kofa National Wildlife Refuge

Description

Kofa National Wildlife Refuge was established in 1939. The refuge encompasses 665,400 acres of pristine desert that is home to the desert bighorn sheep and the California fan palm, the only native palm in Arizona.

Bighorn sheep are found chiefly in the two mountain ranges that dominate the refuge landscape - the Kofa and Castle Dom Mountains. Although these mountains are not especially high, they are extremely rugged and rise sharply from the surrounding desert plains, providing excellent bighorn sheep habitat. A wide variety of plant life is found throughout the refuge.

Area Economy

Kofa NWR is located in southwestern Arizona near the Colorado River. Table 2-26 shows the area economy. The area population increased by 36.0 percent from 1995 to 2005, compared with a 34.3 percent increase for the state of Arizona and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 36.0 percent from 1995 to 2005, with the state of Arizona showing a 42.3 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 1.6 percent over the 1995-2005 period, while the state of Arizona and the U.S. increased by 14.1 and 13.2 percent respectively.

Table 2-26. Kofa NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Yuma AZ	181.6	37.8%	82.9	37.7%	$21,005	-6.6%
La Paz AZ	20.2	21.9%	8.1	20.3%	$20,683	11.5%
Area Total	201.8	36.0%	91	36.0%	$20,844	1.6%
Arizona	5,953.0	34.3 %	3,237.2	42.3 %	$30,019	14.1 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 2-27 shows the recreation visits for Kofa NWR. The Refuge had 302,680 visits in 2006. Eighty percent of all of the visits were for non-consumptive recreation. Approximately three-fourths of visits were by residents.

Visitors enjoy camping on the refuge up to two weeks within a calendar year, and much of the overnight camping is associated with upland game and big game hunting. Other wildlife observation includes visitors to the refuge looking for any wildlife they might find, including birds, desert bighorn sheep, and desert mule deer. Other recreation includes visitors driving the more than 300 miles of unpaved roads, enjoying the scenery, taking photographs, and hiking to look at wildlife water sources, historic buildings, and desert plants.

Table 2-27. Kofa NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	6,527	2,176	8,703
Observation Platforms	0	0	0
Birding	90	10	100
Other Wildlife Observation	41,810	4,646	46,456
Beach /Water Use	0	0	0
Other Recreation	182,333	60,778	243,111
Hunting:			
Big Game	1,179	131	1,310
Small Game	2,400	600	3,000
Migratory Birds	0	0	0
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	***234,340***	***68,340***	***302,680***

Regional Economic Analysis

The economic area for the Refuge is Yuma and La Paz Counties in Arizona. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 2-28. Total expenditures were $9.7 million with non-residents accounting for $5.7 million or 58 percent of total expenditures. Expenditures on non-consumptive activities accounted for 98 percent of all expenditures.

Table 2-28. Kofa NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$1.55	$0.84	$2.39
Other Non-Consumptive	$3,936.81	$5,606.05	$9,542.86
Total Non-Consumptive	$3,938.36	$5,606.89	$9,545.25
Hunting:			
Big Game	$57.3	$22.7	$79.9
Small Game	$69.3	$35.1	$104.4
Migratory Birds	—	—	—
Total Hunting	$126.6	$57.7	$184.3
Fishing:			
Freshwater	—	—	—
Saltwater	—	—	—
Total Fishing	—	—	—
Total Expenditures	***$4,064.9***	***$5,664.6***	***$9,729.5***

Table 2-29 summarizes the local economic effects associated with recreation visits. Final demand totaled $8.7 million with associated employment of 158 jobs, $3.6 million in employment income and $1.1 million in total tax revenue.

Table 2-29. Kofa NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$3,521.3	$5,194.7	$8,715.9
Jobs	77	81	158
Job Income	$1,626.6	$1,959.3	$3,585.9
Total Tax Revenue	$470.2	$642.4	$1,112.5

Table 2-30 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $14.83 means that for every $1 of budget expenditures, $14.83 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. Kofa NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Kofa NWR	$1,348.0	$9,729.5	$10,267.7	$14.83

Maxwell National Wildlife Refuge

Description

Located in the high central plains of northeastern New Mexico, Maxwell National Wildlife Refuge was established in 1965 as a feeding and resting area for migratory birds. Over 350 acres of the Refuge are planted with wheat, corn, barley, and alfalfa to provide food for resident and migratory wildlife. Visitors may see bald and golden eagles, falcons, hawks, sandhill cranes, ducks, white pelicans, burrowing owls, great horned owls, black-tailed prairie dogs, coyotes, mule deer, white-tailed deer, and the occasional elk. The refuge has approximately 2200 acres of both healthy and disturbed short-grass prairie habitat, some of which is in the process of being restored.

Area Economy

Maxwell NWR is located in northern New Mexico near the Colorado border. Table 2-31 shows the area economy. The county population decreased by 2.6 percent from 1995 to 2005, compared with a 12 percent increase for the state of New Mexico and a 11.4 percent increase for the U.S. as a whole. County employment increased by 12.6 percent from 1995 to 2005, with the state of New Mexico showing a 17.6 percent increase and the U.S. a 17.0 percent increase. Per capita income in the county increased by 14.8 percent over the 1995-2005 period, while the state of New Mexico and the U.S. increased by 14.7 and 13.2 percent respectively.

Table 2-31. Maxwell NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Colfax NM	13.7	-2.6%	8.5	12.6%	$24,584	14.8%
New Mexico	1,926.0	12.0 %	1064.4	17.6 %	$27,889	14.7 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 2-32 shows the recreation visits for Maxwell NWR. The Refuge had 3,660 visits in 2006. Almost all of the visits were for fishing with residents accounting for 86 percent of Refuge visitation.

Table 2-32. Maxwell NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	0	10	10
Observation Platforms	0	0	0
Birding	9	441	450
Other Wildlife Observation	95	5	100
Beach /Water Use	0	0	0
Other Recreation	50	0	50
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	2,989	61	3,050
Saltwater	0	0	0
Total Visitation	***3,143***	***517***	***3,660***

Regional Economic Analysis

The economic area for the Refuge is Colfax County, New Mexico. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 2-33 . Total expenditures were $90,400 with residents accounting for $50,700 or 56 percent of total expenditures. Expenditures on fishing accounted for 58 percent of all expenditures, and non-consumptive activities accounted for 42 percent.

Table 2-33. Maxwell NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$0.2	$37.0	$37.1
Other Non-Consumptive	$0.7	$0.3	$1.1
Total Non-Consumptive	$0.9	$37.32	$38.2
Hunting:			
Big Game	–	–	–
Small Game	–	–	–
Migratory Birds	–	–	–
Total Hunting	–	–	–
Fishing:			
Freshwater	$49.8	$2.4	$52.2
Saltwater	–	–	–
Total Fishing	$49.8	$2.4	$52.2
Total Expenditures	***$50.7***	***$39.7***	***$90.4***

Table 2-34 summarizes the local economic effects associated with recreation visits. Final demand totaled $68,300 with associated employment of 2 jobs, $27,500 in employment income and $8,900 in total tax revenue.

Table 2-34. Maxwell NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$37.8	$30.5	$68.3
Jobs	1	1	2
Job Income	$16.1	$11.4	$27.5
Total Tax Revenue	$4.9	$3.9	$8.9

Table 2-35 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $0.52 means that for every $1 of budget expenditures, $0.52 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. Maxwell NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Maxwell NWR	$353.2	$90.4	$93.8	$0.52

Santa Ana National Wildlife Refuge

Description

Along the banks of the lower Rio Grande is the Santa Ana National Wildlife Refuge, a 2,088 acre refuge established in 1943 for the protection of migratory birds. Considered the 'jewel' of the refuge system, this essential 'island' of thorn forest habitat is host or home to nearly 400 different types of birds and a myriad of other species, including the indigo snake, malachite butterfly and the endangered ocelot.

At an ecological crossroad, Santa Ana is strategically located where subtropical climate, gulf coast, great plains and Chihuahuan desert meet. Thousands of birds from the Central and Mississippi flyways funnel through the area on their way to and from Central and South America. This small patch of midvalley riparian woodland is also habitat for about one half of all butterfly species found in the United States. Before dams and control structures significantly reduced the flow of the Rio Grande, periodic floods cut shifting channels into the delta creating crescent-shaped oxbow lakes, referred to as 'resacas.' Santa Ana's management program mimics the historical flooding of the Rio Grande, maintaining the bottom land hardwood forest and providing crucial nesting and feeding habitat for birds, watering holes for animals, and homes for countless amphibians, reptiles, crustaceans and insects.

With over 95 percent of the original habitat in the lower Rio Grande delta cleared or altered, Santa Ana is a reminder of the semitropical thorn forest that once dominated the area.

Area Economy

Santa Ana NWR is located in southern Texas on the Rio Grande River. Table 2-36 shows the area economy. The area population increased by 33.4 percent from 1995 to 2005, compared with a 20.9 percent increase for the state of Texas and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 49.4 percent from 1995 to 2005, with the state of Texas showing a 24.6 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by 10.2 percent over the 1995-2005 period, while the state of Texas and the U.S. increased by 17.1 and 13.2 percent respectively.

Table 2-36. Santa Ana NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Hildago TX	678.7	39.2%	267.4	62.3%	$16,359	11.9%
Cameron TX	378.9	24.3%	156.2	31.6%	$17,410	8.6%
Area Total	**1,057.6**	**33.4%**	**423.6**	**49.4%**	**$16,885**	**10.2%**
Texas	22,928.5	20.9 %	13,088.9	24.6 %	$32,460	17.1 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 2-37 shows the recreation visits for Santa Ana NWR. The Refuge had 257,500 visits in 2006. All of the visits were for non-consumptive recreation with non-residents accounting for 81 percent of all Refuge visitation.

Table 2-37. Santa Ana NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	19,300	77,200	96,500
Observation Platforms	14,000	56,000	70,000
Birding	8,000	72,000	80,000
Other Wildlife Observation	1,000	4,000	5,000
Beach /Water Use	0	0	0
Other Recreation	6,000	0	6,000
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	***48,300***	***209,200***	***257,500***

Regional Economic Analysis

The economic area for the Refuge is Hildago and Cameron Counties, Texas. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 2-38. Total expenditures were $5.2 million with non-residents accounting for $5.0 million or 96 percent of total expenditures.

Table 2-38. Santa Ana NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$68.9	$3,017.9	$3,086.8
Other Non-Consumptive	$121.5	$2,028.7	$2,150.2
Total Non-Consumptive	$190.4	$5,046.6	$5,237.0
Hunting:			
Big Game	–	–	–
Small Game	–	–	–
Migratory Birds	–	–	–
Total Hunting	–	–	–
Fishing:	–	–	–
Freshwater	–	–	–
Saltwater	–	–	–
Total Fishing	–	–	–
Total Expenditures	***$190.4***	***$5,046.6***	***$5,237.0***

Table 2-39 summarizes the local economic effects associated with recreation visits. Final demand totaled $5.6 million with associated employment of 82 jobs, $2.0 million in employment income and $654,100 in total tax revenue.

Table 2-39. Santa Ana NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$203.1	$5,395.3	$5,598.4
Jobs	4	78	82
Job Income	$87.6	$1,916.0	$2,003.6
Total Tax Revenue	$25.1	$629.0	$654.1

Table 2-40 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $19.75 means that for every $1 of budget expenditures, $19.75 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. Santa Ana NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Santa Ana NWR	$389.6	$5,237.0	$2,457.8	$19.75

Sequoyah National Wildlife Refuge

Description

Sequoyah National Wildlife Refuge was established in 1970 to provide habitat for waterfowl and other migratory birds and to provide food and cover for resident wildlife. The refuge was named in honor of Sequoyah, a Cherokee Native American who developed an alphabet for the Cherokee language.

Wildlife found at Sequoyah NWR varies with the seasons. During fall, winter, and spring, waterfowl are numerous. Mallards are, by far, the most abundant of the wintering ducks. The refuge hosts the largest concentration of snow geese in the state, and large numbers of wading and shorebirds are common in the summer and fall.

The bottomland habitat provides a home for a variety of wildlife, including songbirds, hawks, bobwhite quail, bobcat, squirrels, muskrat, and rabbits. Reptiles, such as the green tree frog, diamondback water snake, red-eared slider, cottonmouth, and bullfrog are also common in the refuge woodlands.

The refuge is located approximately 150 miles east of Oklahoma City, and 35 miles west of Fort Smith, Arkansas, off of Interstate 40.

Area Economy

Sequoyah NWR is located in eastcentral Oklahoma. Table 2-41 shows the area economy. The area population increased by 5.6 percent from 1995 to 2005, compared with a 7.1 percent increase for the state of Oklahoma and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 15.3 percent from 1995 to 2005, with the state of Oklahoma showing a 14.4 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by 18.9 percent over the 1995-2005 period, while the state of Oklahoma and the U.S. increased by 20.3 and 13.2 percent respectively.

Table 2-41. Sequoyah NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Sequoyah OK	40.8	12.1%	14.1	5.6%	$22,086	13.2%
Haskell OK	12.1	5.9%	6.6	41.0%	$23,226	27.3%
Muskogee OK	70.7	2.1%	39.9	15.7%	$23,813	17.0%
Area Total	123.5	5.6%	60.6	15.3%	$23,042	18.9%
Oklahoma	3,543.4	7.1 %	2,071.8	14.4 %	$29,948	20.3 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 2-42 shows the recreation visits for Sequoyah NWR. The Refuge had 88,020 visits in 2006. Non-consumptive recreation accounted for 34,991 visits, fishing 29,748 visits and hunting 23,281 visits. Residents accounted for 60,288 visits or 68 percent of all visits.

Table 2-42. Sequoyah NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	770	330	1,100
Observation Platforms	510	340	850
Birding	9,858	9,858	19,716
Other Wildlife Observation	10,516	2,629	13,145
Beach /Water Use	36	144	180
Other Recreation	0	0	0
Hunting:			
Big Game	145	16	161
Small Game	320	80	400
Migratory Birds	11,360	11,360	22,720
Fishing:			
Freshwater	26,773	2,975	29,748
Saltwater	0	0	0
Total Visitation	***60,288***	***27,732***	***88,020***

Regional Economic Analysis

The economic area for the Refuge is Sequoyah, Haskell and Muskogee Counties in Oklahoma. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 2-43. Total expenditures were $2.6 million with non-residents accounting for $1.5 million or 56 percent of total expenditures. Expenditures on hunting activities accounted for 39 percent of all expenditures, followed by non-consumptive activities and fishing at 34 and 27 percent respectively.

Table 2-43. Sequoyah NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$113.23	$550.93	$664.16
Other Non-Consumptive	$98.05	$130.93	$228.98
Total Non-Consumptive	$211.28	$681.86	$893.14
Hunting:			
Big Game	$7.0	$2.8	$9.8
Small Game	$4.6	$2.3	$7.0
Migratory Birds	$376.2	$625.4	$1,001.5
Total Hunting	$387.8	$630.5	$1,018.3
Fishing:			
Freshwater	$557.6	$144.8	$702.4
Saltwater	–	–	–
Total Fishing	$557.6	$144.8	$702.4
Total Expenditures	***$1,156.7***	***$1,457.2***	***$2,613.8***

Table 2-44 summarizes the local economic effects associated with recreation visits. Final demand totaled $2.4 million with associated employment of 47 jobs, $946,000 in employment income and $313,500 in total tax revenue.

Table 2-44. Sequoyah NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$998.2	$1,430.7	$2,428.9
Jobs	23	24	47
Job Income	$422.7	$523.4	$946.0
Total Tax Revenue	$132.0	$181.6	$313.5

Table 2-45 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $7.62 means that for every $1 of budget expenditures, $7.62 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 2-45. Sequoyah NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Sequoyah NWR	$672.0	$2,613.8	$2,506.9	$7.62

Tishomingo National Wildlife Refuge

Description

Tishomingo National Wildlife Refuge lies at the upper Washita arm of Lake Texoma and is administered for the benefit of migratory waterfowl in the Central Flyway. Most of the refuge's 16,464 acres, including the 4,500-acre Cumberland Pool, were acquired in 1946. The refuge gets its name from a famous Chickasaw Indian Chief and is shared with a nearby century-old town.

The 16,464 acre Tishomingo National Wildlife Refuge is one of more than 540 refuges throughout the United States managed by the Fish and Wildlife Service. Tishomingo National Wildlife Refuge lies at the upper Washita arm of Lake Texoma and is administered for the benefit of migratory waterfowl in the Central Flyway. Most of the refuge including the 4,500 acre Cumberland Pool was acquired in 1946.

The refuge offers a variety of aquatic habitats for wildlife. The murky water of Cumberland Pool provides abundant nutrients for innumerable microscopic plants and animals. Seasonally flooded flats and willow shallows lying at the Pool's edge also provide excellent wildlife habitat. Upland areas vary from grasslands to wild plum thickets to oak-hickory-elm woodlands. Crops, primarily wheat and corn, are grown on approximately 900 acres to provide forage and grain for waterfowl.

Area Economy

Tishomingo NWR is located in southcentral Oklahoma near the Texas border. Table 2-46 shows the area economy. The area population increased by 10.0 percent from 1995 to 2005, compared with a 7.1 percent increase for the state of Oklahoma and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 14.4 percent from 1995 to 2005, with the state of Oklahoma showing a 14.4 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by 19.6 percent over the 1995-2005 period, while the state of Oklahoma and the U.S. increased by 20.3 and 13.2 percent respectively.

Table 2-46. Tishomingo NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Johnston OK	10.3	0.5%	4.9	12.7%	$21,715	31.0%
Marshall OK	14.4	18.1%	6.5	15.6%	$22,086	10.3%
Area Total	**24.7**	**10.0%**	**11.5**	**14.4%**	**$21,901**	**19.6%**
Oklahoma	3,543.4	7.1 %	2,071.8	14.4 %	$29,948	20.3 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 2-47 shows the recreation visits for Tishomingo NWR. The Refuge had 205,944 visits in 2006. Non-consumptive recreation visits totaled 182,100 or 88 percent of Refuge visits. Fishing accounted for 11 percent of Refuge visits and hunting accounted for less than 1 percent of Refuge visits. Residents comprise 58 percent of total Refuge visits. "Other wildlife observation" includes auto tours while "other recreation" includes interpretive programs, bicycling, and camping.

Table 2-47. Tishomingo NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	33,600	22,400	56,000
Observation Platforms	10,500	7,000	17,500
Birding	9,100	13,650	22,750
Other Wildlife Observation	21,300	14,200	35,500
Beach /Water Use	0	0	0
Other Recreation	30,210	20,140	50,350
Hunting:			
Big Game	590	393	983
Small Game	158	39	197
Migratory Birds	66	98	164
Fishing:			
Freshwater	13,500	9,000	22,500
Saltwater	0	0	0
Total Visitation	***119,023***	***86,921***	***205,944***

Regional Economic Analysis

The economic area for the Refuge is Johnston and Marshall Counties in Oklahoma. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 2-48. Total expenditures were $4.5 million with non-residents accounting for $3.3 million or 79 percent of total expenditures. Expenditures on non-consumptive activities accounted for 79 percent of all expenditures, followed by fishing and hunting at 19 and 2 percent respectively.

Table 2-48. Tishomingo NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$78.4	$572.1	$650.5
Other Non-Consumptive	$676.6	$2,194.7	$2,871.3
Total Non-Consumptive	$755.0	$2,766.8	$3,521.8
Hunting:			
Big Game	$21.5	$51.0	$72.5
Small Game	$2.3	$1.2	$3.4
Migratory Birds	$1.4	$3.6	$5.1
Total Hunting	$25.2	$55.8	$81.0
Fishing:			
Freshwater	$337.4	$525.7	$863.1
Saltwater	–	–	–
Total Fishing	$337.4	$525.7	$863.1
Total Expenditures	***$1,117.6***	***$3,348.3***	***$4,465.9***

Table 2-49 summarizes the local economic effects associated with recreation visits. Final demand totaled nearly $5.2 million with associated employment of 110 jobs, $1.6 million in employment income and $746,500 in total tax revenue.

Table 2-49. Tishomingo NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$1,293.4	$3,872.1	$5,165.5
Jobs	25	85	110
Job Income	$379.4	$1,182.7	$1,562.2
Total Tax Revenue	$178.9	$567.5	$746.5

Table 2-50 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $9.03 means that for every $1 of budget expenditures, $9.03 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. Tishomingo NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Tishomingo NWR	$883.5	$4,465.9	$3,511.6	$9.03

Washita National Wildlife Refuge

Description

Established in 1961, Washita National Wildlife Refuge is lies on the upper end of Foss Reservoir and provides a feeding and resting area for migrating and wintering waterfowl and sandhill cranes.

November through February brackets the best times to see thousands of waterfowl. Snow geese lift from the waters in a blur of white wings. Canada geese are joined by smaller numbers of Ross and white-fronted geese. Mallards top the duck list, followed by common mergansers (January is their peak month) and pintails.

The refuge rests on the northwest portion of Foss Reservoir between the towns of Butler and Hammon in Custer County, Oklahoma.

Area Economy

Washita NWR is located in westcentral Oklahoma. Table 2-51 shows the area economy. The area population increased by 8.6 percent from 1995 to 2005, compared with a 7.1 percent increase for the state of Oklahoma and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 10.0 percent from 1995 to 2005, with the state of Oklahoma showing a 14.4 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by 22 percent over the 1995-2005 period, while the state of Oklahoma and the U.S. increased by 20.3 and 13.2 percent respectively.

Table 2-51. Washita NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Custer OK	114.9	12.2%	16.6	4.6%	$25,147	15.4%
Beckham OK	18.8	-0.8%	12.3	28.7%	$25,002	29.3%
Roger Mills OK	3.3	-11.4%	2.1	3.2%	$25,963	31.0%
Washita Ok	11.4	-1.2%	5.0	-4.9%	$21,606	13.0%
Area Total	**148.5**	**8.6%**	**36.1**	**10.0%**	**$24,430**	**22.0%**
Oklahoma	3,543.4	7.1 %	2,071.8	14.4 %	$29,948	20.3 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 2-52 shows the recreation visits for Washita NWR. The Refuge had 58,582 visits in 2006. Non-consumptive recreation totaled 34,190 visits, fishing 23,904 and hunting 488. Residents accounted for 40,839 visits, or 70 percent of total visits.

Table 2-52. Washita NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	20,468	8,772	29,240
Observation Platforms	3,465	1,485	4,950
Birding	0	0	0
Other Wildlife Observation	0	0	0
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	11	95	106
Small Game	84	36	120
Migratory Birds	79	183	262
Fishing:			
Freshwater	16,733	7,171	23,904
Saltwater	0	0	0
Total Visitation	***40,839***	***17,743***	***58,582***

Regional Economic Analysis

The economic area for the Refuge is Custer, Beckam, Roger Mills and Washita Counties in Oklahoma. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 2-53. Total expenditures were $1.1 million with non-residents accounting for $638,200 or 57 percent of total expenditures. Expenditures on fishing accounted for 62 percent of all expenditures, followed by non-consumptive activities and hunting at 35 and 2 percent respectively.

Table 2-53. Washita NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	–	–	–
Other Non-Consumptive	$127.50	$265.87	$393.37
Total Non-Consumptive	$127.50	$265.87	$393.37
Hunting:			
Big Game	$0.4	$12.4	$12.8
Small Game	$0.9	$0.8	$1.7
Migratory Birds	$2.6	$10.1	$12.7
Total Hunting	$3.9	$23.3	$27.2
Fishing:			
Freshwater	$348.5	$349.1	$697.6
Saltwater	–	–	–
Total Fishing	$348.5	$349.1	$697.6
Total Expenditures	***$479.9***	***$638.2***	***$1,118.1***

Table 2-54 summarizes the local economic effects associated with recreation visits. Final demand totaled $965,000 with associated employment of 20 jobs, $374,400 in employment income and $127,300 in total tax revenue.

Table 2-54. Washita NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$409.5	$555.6	$965.0
Jobs	10	10	20
Job Income	$173.4	$201.0	$374.4
Total Tax Revenue	$55.7	$71.7	$127.3

Table 2-55 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $3.34 means that for every $1 of budget expenditures, $3.34 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 2-55. Washita NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Washita NWR	$673.3	$1,118.1	$1,130.2	$3.34

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:

Big Muddy NFWR (Missouri)
De Soto NWR (Iowa)
Fergus Falls WMD (Minnesota)
Leopold WMD (Wisconsin)
Minnesota Valley NWR (Minnesota)
Muscatatuck NWR (Indiana)
Neal Smith NWR (Iowa)
Ottawa NWR (Ohio)
Sherburne NWR (Minnesota)
Shiawassee NWR (Michigan)
St. Croix WMD (Wisconsin)
Tamarac NWR (Minnesota)
Trempealeau NWR (Wisconsin)

Big Muddy National Fish and Wildlife Refuge

Description

The Big Muddy National Fish and Wildlife Refuge is growing. Established in 1994, the refuge has grown to over 11,000 acres. Like pearls on a string, these acres are spread out as individual units along the Missouri River between Kansas City and St. Louis. These pearls of habitat benefit floodplain-dependent fish and wildlife species. The Big Muddy Refuge is planning to grow to 60,000 acres by buying land from willing sellers who want to see their properties set aside for the benefit of wildlife and the enjoyment of all.

The pre-development Missouri River as documented by Lewis and Clark was considerably different from today's river. The historic Missouri was a broad, slow-moving, shallow river with braided channels. To put it in perspective, Lewis and Clark didn't float up the Missouri River, they pulled and poled their boats up. These past river conditions created a haven for wildlife, which included vast floodplain forests of giant trees, marshes, and even wet prairies. Today's river is channelized. It is deeper and faster, and controlled by levees, dikes, and other containment structures. These controls make the river more navigable and the surrounding floodplain ideal for agriculture.

The Big Muddy Refuge is allowing the Missouri River to be a river again. In locations where we have acquired enough land and are not affecting preferred conditions of adjacent private lands, we are allowing the river to enter its floodplain. This occurs during minor flood events. We have created side channels, cut down levees, and allowed the floodplain vegetation to return. Currently, in many places the refuge is an impenetrable thicket of young trees and vegetation, but, as the trees grow and the refuge matures, its appearance will change. The process may take decades or even centuries, but we are committed to the future benefit of fish and wildlife resources in the Missouri River floodplain.

Area Economy

Big Muddy NWR is located in central Missouri. Table 3-1 shows the area economy. The area population increased by 1.4 percent from 1995 to 2005, compared with a 7.8 percent increase for the state of Missouri and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 8.2 percent from 1995 to 2005, with the state of Missouri showing a 11.2 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by 9.9 percent over the 1995-2005 period, while the state of Missouri and the U.S. increased by 9.9 and 13.2 percent respectively.

Table 3-1. Big Muddy NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
9-County Area	1,928	1.4%	1,416	8.2%	$30,185	12.7%
Missouri	5,797.7	7.8%	3,576.9	11.2%	$31,261	9.9%
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 3-2 shows the recreation visits for Big Muddy NWR. The Refuge had 5,275 visits in 2006. Hunting accounted for 2,500 visits, non-consumptive recreation for 1,775 visits and fishing accounted for 1,000 visits. Residents accounted for 4,388 visits, or 83 percent of total Refuge visits.

Table 3-2. Big Muddy NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	270	30	300
Observation Platforms	0	0	0
Birding	1,080	120	1,200
Other Wildlife Observation	248	28	275
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	1,260	140	1,400
Small Game	0	400	400
Migratory Birds	630	70	700
Fishing:			
Freshwater	900	100	1,000
Saltwater	0	0	0
Total Visitation	***4,388***	***888***	***5,275***

Regional Economic Analysis

The economic area for the Refuge includes the following counties in Missouri: St. Louis, Osage, Boone, Howard, Cooper, Saline, Lafayette, Ray, and Jackson. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2006 are shown in Table 3-3. Total expenditures were $83,100 with residents accounting for $47,800 or 58 percent of total expenditures. Expenditures on hunting accounted for 73 percent of all expenditures, followed by fishing and non-consumptive activities at 16 and 11 percent respectively.

Table 3-3. Big Muddy NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$4.7	$2.3	$6.9
Other Non-Consumptive	$1.6	$0.8	$2.4
Total Non-Consumptive	$6.3	$3.1	$9.4
Hunting:			
Big Game	$19.0	$6.4	$25.3
Small Game	—	$15.7	$15.7
Migratory Birds	$13.0	$6.9	$19.8
Total Hunting	$31.9	$28.9	$60.8
Fishing:			
Freshwater	$9.6	$3.3	$13.0
Saltwater	—	—	—
Total Fishing	$9.6	$3.3	$13.0
Total Expenditures	***$47.8***	***$35.3***	***$83.1***

Table 3-4 summarizes the local economic effects associated with recreation visits. Final demand totaled $95,200 with associated employment of 1 job, $39,700 in employment income and $12,600 in total tax revenue.

Table 3-4. Big Muddy NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$52.8	$42.4	$95.2
Jobs	0.8	0.5	1
Job Income	$23.2	$16.5	$39.7
Total Tax Revenue	$7.1	$5.5	$12.6

Table 3-5 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $0.24 means that for every $1 of budget expenditures, $0.24 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 3-5. Big Muddy NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Big Muddy NWR	$943.0	$83.1	$141.6	$0.24

De Soto National Wildlife Refuge

Description

DeSoto National Wildlife Refuge is part of a network of refuges devoted to preserving and restoring increasingly scarce habitat for migratory waterfowl and other wildlife. The refuge is comprised of 8,358 acres in Iowa and Nebraska and lies in the Missouri River Valley floodplain on a former meander of the Missouri River.

Each year, especially during the fall, spectacular flights of ducks and geese mark the changing seasons along this traditional waterfowl flyway. An interesting assortment of warblers, raptors, shorebirds, and other bird life can be observed also.

The 1968 excavation of the steamboat Bertrand, which sank in 1865, adds a major historical emphasis to the refuge program. The 200,000 pieces in the Bertrand Collection provide one of the most significant assemblages of Civil War era artifacts in the country.

A former oxbow of the Missouri River, DeSoto Lake, provides recreational use for up to 250,000 visitors annually. The DeSoto Visitor Center provides an introduction to the refuge, exhibits the Bertrand Collection, and contains interpretive displays on the historical development of the Missouri River Basin, the ecological impacts of that development, and the natural history of the area.

Area Economy

De Soto NWR is located in southwestern Iowa near the Nebraska border. Table 3-6 shows the area economy. The area population increased by 7.2 percent from 1995 to 2005, compared with a 3.4 percent increase for the state of Iowa and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 18.1 percent from 1995 to 2005, with the state of Iowa showing a 9.6 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by 15.2 percent over the 1995-2005 period, while the state of Iowa and the U.S. increased by 14.6 and 13.2 percent respectively.

Table 3-6. De Soto NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Washington NE	19.8	12.1%	10.9	28.0%	$33,207	14.6%
Harrison IA	15.8	3.5%	6.9	6.5%	$27,326	13.1%
Pottawattamie IA	89.7	6.8%	49.2	17.9%	$30,366	18.0%
Area Total	**125.3**	**7.2%**	**67.0**	**18.1%**	**$30,300**	**15.2%**
Iowa	2,965.5	3.4 %	1,968.2	9.6 %	$31,670	14.6 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 3-7 shows the recreation visits for De Soto NWR. The Refuge had 283,781 visits in 2006. Almost all of the visits were for non-consumptive recreation with 261,581 visits; fishing accounted for 20,000 visits and hunting 2,200. Residents accounted for 180,779 visits, or 64 percent of total Refuge visits.

Table 3-7. De Soto NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	22,939	15,293	38,232
Observation Platforms	6,000	4,000	10,000
Birding	62,309	41,540	103,849
Other Wildlife Observation	60,000	40,000	100,000
Beach /Water Use	0	0	0
Other Recreation	8,550	950	9,500
Hunting:			
Big Game	1,935	215	2,150
Small Game	45	5	50
Migratory Birds	0	0	0
Fishing:			
Freshwater	19,000	1,000	20,000
Saltwater	0	0	0
Total Visitation	***180,779***	***103,002***	***283,781***

Regional Economic Analysis

The economic area for the Refuge is Washington County in Nebraska, and Harrison and Pottawatamie Counties in Iowa. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 3-8. Total expenditures were $2.9 million with non-residents accounting for $1.9 million or 67 percent of total expenditures. Expenditures on non-consumptive activities accounted for 90 percent of all expenditures, followed by fishing and hunting at 8 and 2 percent respectively.

Table 3-8. De Soto NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$268.4	$782.1	$1,050.5
Other Non-Consumptive	$425.3	$1,105.5	$1,530.9
Total Non-Consumptive	$693.7	$1,887.6	$2,581.3
Hunting:			
Big Game	$38.8	$13.1	$51.9
Small Game	$0.5	$0.3	$0.8
Migratory Birds	—	—	—
Total Hunting	$39.3	$13.4	$52.7
Fishing:			
Freshwater	$203.1	$33.3	$236.4
Saltwater	—	—	—
Total Fishing	$203.1	$33.3	$236.4
Total Expenditures	***$936.1***	***$1,934.3***	***$2,870.4***

Table 3-9 summarizes the local economic effects associated with recreation visits. Final demand totaled $2.6 million with associated employment of 52 jobs, $999,300 in employment income and $364,500 in total tax revenue.

Table 3-9. De Soto NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$854.6	$1,711.9	$2,566.6
Jobs	19	33	52
Job Income	$305.0	$694.2	$999.3
Total Tax Revenue	$122.8	$241.7	$364.5

Table 3-10 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $4.26 means that for every $1 of budget expenditures, $4.26 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 3-10. De Soto NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
De Soto NWR	$1,513.0	$2,870.4	$3,578.1	$4.26

Fergus Falls Wetland Management District

Description

The Fergus Falls Wetland Management District was established in 1962 with the initiation of the Accelerated Small Wetlands Acquisition Program. The mission of the district is to identify, protect, and restore the tallgrass prairie/wetland ecosystem and associated habitats and to provide opportunities for outdoor recreation and environmental education. For this purpose, the district currently manages 216 waterfowl production areas (WPAs) totaling 44,499 acres, and 1,148 perpetual easements protecting 24,015 acres of wetlands on private land. Thirty-nine perpetual wildlife habitat easements covering 4,185 acres of wetland and grassland habitats on private land have also been obtained.

In addition the District manages the Prairie Wetlands Learning Center which has innovative environmental education programs and a wide array of visitor opportunities all focused on understanding prairie wetlands and grasslands.

Area Economy

Fergus Falls WMD is located in westcentral Minnesota. Table 3-11 shows the area economy. The area population increased by 7.1 percent from 1995 to 2005, compared with a 10.0 percent increase for the state of Minnesota and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 18.1 percent from 1995 to 2005, with the state of Minnesota showing a 16.0 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by 19.0 percent over the 1995-2005 period, while the state of Minnesota and the U.S. increased by 17.3 and 13.2 percent respectively.

Table 3-11. Fergus Falls WMD:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Douglas MN	35.1	14.0%	26.2	35.6%	$30,121	24.1%
Grant MN	6.1	-3.3%	3.7	-1.9%	$26,640	13.1%
Otter Tail MN	57.6	7.7%	35.5	17.4%	$27,760	15.6%
Wilkin MN	6.8	-6.9%	3.6	-2.4%	$27,846	20.0%
Wadena MN	13.6	1.9%	7.9	-2.5%	$24,642	22.8%
Area Total	**119.1**	**7.1%**	**77.0**	**18.1%**	**$27,402**	**19.0%**
Minnesota	5,126.7	10.0 %	3,498.6	16.0 %	$37,290	17.3 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 3-12 shows the recreation visits for Fergus Falls WMD. The WMD had 93,298 visits in 2006. Non-consumptive recreation accounted for 67,918 visits, and hunting 25,980. Residents accounted for 70 percent of all Refuge visits.

Table 3-12. Fergus Falls WMD: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	4,505	795	5,300
Observation Platforms	0	0	0
Birding	112	20	132
Other Wildlife Observation	22,332	3,941	26,273
Beach /Water Use	0	0	0
Other Recreation	27,160	9,053	36,213
Hunting:			
Big Game	3,555	4,345	7,900
Small Game	2,556	3,124	5,680
Migratory Birds	5,310	6,490	11,800
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	***65,530***	***27,768***	***93,298***

Regional Economic Analysis

The economic area for theWMD consists of the following counties in Minnesota: Douglas, Grant, Otter Tail, Wilkin, and Wadena. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2006 are shown in Table 3-13. Total expenditures were $1.5 million with non-residents accounting for $1.1 million or 74 percent of total expenditures. Expenditures on hunting activities accounted for 69 percent of all expenditures.

Table 3-13. Fergus Falls WMD: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$0.5	$0.4	$0.9
Other Non-Consumptive	$222.9	$252.1	$475.0
Total Non-Consumptive	$223.3	$252.5	$475.8
Hunting:			
Big Game	$71.3	$264.0	$335.3
Small Game	$18.7	$122.3	$141.0
Migratory Birds	$82.0	$477.1	$559.2
Total Hunting	$172.0	$863.4	$1,035.4
Fishing:			
Freshwater	–	–	–
Saltwater	–	–	–
Total Fishing	–	–	–
Total Expenditures	***$395.3***	***$1,115.9***	***$1,511.3***

Table 3-14 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.5 million with associated employment of 26 jobs, $571,500 in employment income and $207,900 in total tax revenue.

Table 3-14. Fergus Falls WMD: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$362.1	$1,086.1	$1,448.2
Jobs	8	18	26
Job Income	$161.7	$409.9	$571.5
Total Tax Revenue	$55.1	$152.8	$207.9

Table 3-15 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $1.29 means that for every $1 of budget expenditures, $1.29 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 3-15. Fergus Falls WMD: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Fergus Falls WMD	$2,508.0	$1,511.3	$1,724.3	$1.29

Leopold Wetland Management District

Description

The Leopold Wetland Management District is named after Aldo Leopold, who is widely acknowledged as the father of wildlife conservation in America. Leopold is perhaps best known as the author of A Sand County Almanac, a book compiled of essays written on his farm in central Wisconsin. In tribute to his philosophy, the Leopold Wetland Management District is dedicated to preserving, restoring, and enhancing wildlife habitat in Wisconsin for the benefit of present and future generations.

The district, established in 1993, manages over 12,000 acres of waterfowl production areas (WPAs) in 17 southeastern Wisconsin counties, covering some of the most important waterfowl areas of Wisconsin. The district also administers 45 conservation easements, totaling 3,000 acres, in 34 eastern Wisconsin counties. WPAs consist of wetland habitat surrounded by grassland and woodland communities. While WPAs are managed primarily for ducks and geese, they also provide habitat for a variety of other wildlife species such as non-game grassland birds, shorebirds, wading birds, mink, muskrat, wild turkey, and deer.

Area Economy

Leopold WMD is located in southeastern Wisconsin. Table 3-16 shows the area economy. The area population increased by 9.2 percent from 1995 to 2005, compared with a 6.6 percent increase for the state of Wisconsin and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 15.7 percent from 1995 to 2005, with the state of Wisconsin showing a 12.6 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by 13.5 percent over the 1995-2005 period, while the state of Wisconsin and the U.S. increased by 13.5 and 13.2 percent respectively.

Table 3-16. Leopold WMD:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
17 County Total	1,747.1	9.2 %	1,168.0	15.7 %	$31,620	13.5 %
Wisconsin	5,527.6	6.6 %	3,535.7	12.6 %	$33,278	13.5 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 3-17 shows the recreation visits for Leopold WMD. The WMD had 37,050 visits in 2006. Hunting accounted for 24,500 visits, non-consumptive use 12,500 visits and fishing 50 visits. Residents accounted for 72 percent of all WMD visits.

Table 3-17. Leopold WMD: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	1,875	625	2,500
Observation Platforms	3,750	1,250	5,000
Birding	1,250	1,250	2,500
Other Wildlife Observation	1,250	1,250	2,500
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	7,500	2,500	10,000
Small Game	4,875	1,625	6,500
Migratory Birds	6,000	2,000	8,000
Fishing:			
Freshwater	45	5	50
Saltwater	0	0	0
Total Visitation	***26,545***	***10,505***	***37,050***

Regional Economic Analysis

The economic area for the Refuge is Adams, Columbia, Dane, Dodge, Fond Du Lac, Jefferson, Manitowac, Marquette, Oconto, Outagamie, Ozaukee, Rock, Sauk, Shawano, Sheboygan, Waushara, and Winnebago Counties in Wisconsin. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 3-18. Total expenditures were $583,700 with non-residents accounting for $346,200 or 59 percent of total expenditures. Expenditures on hunting activities accounted for 83 percent of all expenditures, followed by non-consumptive activities and fishing at 17 and less than 1 percent respectively.

Table 3-18. Leopold WMD: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$5.4	$23.5	$28.9
Other Non-Consumptive	$21.5	$47.1	$68.6
Total Non-Consumptive	$26.9	$70.6	$97.52
Hunting:			
Big Game	$112.8	$113.9	$226.7
Small Game	$35.7	$63.6	$99.3
Migratory Birds	$61.8	$98.0	$159.8
Total Hunting	$210.3	$275.6	$485.8
Fishing:			
Freshwater	$0.2	$0.1	$0.3
Saltwater	—	—	—
Total Fishing	$0.2	$0.1	$0.3
Total Expenditures	***$237.4***	***$346.2***	***$583.7***

Table 3-19 summarizes the local economic effects associated with recreation visits. Final demand totaled $652,700 with associated employment of 10 jobs, $259,500 in employment income and $94,600 in total tax revenue.

Table 3-19. Leopold WMD: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$244.3	$408.4	$652.7
Jobs	4	5	10
Job Income	$107.1	$152.4	$259.5
Total Tax Revenue	$36.8	$57.7	$94.6

Table 3-20 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $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 3-20. Leopold WMD: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Leopold WMD	$1,161.6	$583.7	$855.1	$1.24

Minnesota Valley National Wildlife Refuge

Description

Minnesota Valley National Wildlife Refuge is located within the urban and suburban areas of Minneapolis and St. Paul. It is a green belt of large marsh areas bordered by office buildings, highways, residential areas, and grain terminals. The refuge is comprised of fourteen linear units totaling approximately 14,000 acres, spanning 99 miles of the Minnesota River.

The focal point of the refuge is the visitor center, which features 8,000 square feet of exhibit space, a 125-seat auditorium, two multi-purpose classrooms, a bookstore, an art gallery, and an observation deck. Environmental education and interpretation are conducted from this facility. Additional interpretive programs conducted by Park Rangers and volunteer naturalists are offered on numerous refuge unites. Recreational activities include hiking, cross-country skiing, hunting, and fishing.

Area Economy

Minnesota Valley NWR is located in Minneapolis, Minnesota. Table 3-21 shows the area economy. The area population increased by 11.8 percent from 1995 to 2005, compared with a 10.0 percent increase for the state of Minnesota and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 14.1 percent from 1995 to 2005, with the state of Minnesota showing a 16.0 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by 16.4 percent over the 1995-2005 period, while the state of Minnesota and the U.S. increased by 17.3 and 13.2 percent respectively.

Table 3-21. Minnesota Valley NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Hennepin MN	1,118.7	3.9%	1,044.9	8.1%	$49,566	19.1%
Carver MN	84.9	42.4%	34.8	23.7%	$44,137	20.5%
Scott MN	120.0	69.1%	54.4	48.9%	$34,955	9.9%
Dakota MN	383.4	20.1%	229.2	39.9%	$41,416	14.7%
Area Total	**1,707.1**	**11.8%**	**1,363.3**	**14.1%**	**$42,519**	**16.4%**
Minnesota	5,126.7	10.0 %	3,498.6	16.0 %	$37,290	17.3 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 3-22 shows the recreation visits for Minnesota Valley NWR. The Refuge had 257,250 visits in 2006. Almost all of the visits were for non-consumptive recreation. Residents accounted for 80 percent of all Refuge visitation.

Table 3-22. Minnesota Valley NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	80,520	20,130	100,650
Observation Platforms	40,000	10,000	50,000
Birding	72,000	18,000	90,000
Other Wildlife Observation	8,000	2,000	10,000
Beach /Water Use	0	0	0
Other Recreation	100	0	100
Hunting:			
Big Game	570	30	600
Small Game	950	50	1,000
Migratory Birds	95	5	100
Fishing:			
Freshwater	4,560	240	4,800
Saltwater	0	0	0
Total Visitation	206,795	50,455	257,250

Regional Economic Analysis

The economic area for the Refuge is Hennepin, Carver, Scott and Dakota Counties in Minnesota. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 3-23. Total expenditures were $1.3 million with non-residents accounting for $649,900 or 51 percent of total expenditures. Expenditures on non-consumptive activities accounted for 96 percent of all expenditures.

Table 3-23. Minnesota Valley NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$310.1	$338.9	$649.0
Other Non-Consumptive	$277.6	$302.5	$580.1
Total Non-Consumptive	$587.7	$641.4	$1,229.1
Hunting:			
Big Game	$5.7	$0.9	$6.6
Small Game	$5.2	$1.5	$6.7
Migratory Birds	$0.7	$0.2	$0.9
Total Hunting	$11.7	$2.6	$14.2
Fishing:			
Freshwater	$36.6	$6.0	$42.6
Saltwater	—	—	—
Total Fishing	$36.6	$6.0	$42.6
Total Expenditures	***$635.9***	***$649.9***	***$1,285.9***

Table 3-24 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.5 million with associated employment of 21 jobs, $629,500 in employment income and $214,100 in total tax revenue.

Table 3-24. Minnesota Valley NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$718.3	$757.4	$1,475.7
Jobs	11	10	21
Job Income	$325.6	$303.9	$629.5
Total Tax Revenue	$106.6	$107.5	$214.1

Table 3-25 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $1.48 means that for every $1 of budget expenditures, $1.48 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 3-25. Minnesota Valley NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Minnesota Valley NWR	$2,258.0	$1,285.9	$2,060.3	$1.48

Muscatatuck National Wildlife Refuge

Description

Muscatatuck National Wildlife Refuge is located in south central Indiana. It includes 7,802 acres near Seymour and a 78-acre parcel, known as the Restle Unit, near Bloomington.

Muscatatuck's mission is simple: to restore, preserve, and manage a mix of forest, wetland, and grassland habitat for fish, wildlife, and people. Special management emphasis is given to waterfowl, other migratory birds, and endangered species.

Nine miles of refuge roads that are open sunrise to sunset seven days/week attract approximately 185,000 visitors to the refuge each year. Wildlife-viewing opportunities are excellent at Muscatatuck, and the refuge is known as an exceptionally fine bird watching site.

Area Economy

Muscatatuck NWR is located in south central Indiana. Table 3-26 shows the area economy. The area population increased by 15.0 percent from 1995 to 2005, compared with a 7.1 percent increase for the state of Indiana and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 5.4 percent from 1995 to 2005, with the state of Indiana showing a 8.3 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by 8.6 percent over the 1995-2005 period, while the state of Indiana and the U.S. increased by 10.3 and 13.2 percent respectively.

Table 3-26. Muscatatuck NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Bartholomew IN	73.6	7.6%	52.5	4.9%	$33,955	6.5%
Jackson IN	52.3	30.0%	26.4	6.7%	$27,777	14.9%
Jennings IN	28.5	11.3%	11.5	4.6%	$25,231	5.2%
Area Total	**154.3**	**15.0%**	**90.4**	**5.4%**	**$28,988**	**8.6%**
Indiana	6,266.0	7.1%	3,680.6	8.3%	$31,173	10.3%
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 3-27 shows the recreation visits for Muscatatuck NWR. The Refuge had 110,000 visits in 2006. Non-consumptive recreation visits totaled 91,100 visits, fishing 15,000 visits and hunting 3,900 visits. Non-residents accounted for 56,256 visits or 51 percent of total Refuge visits.

"Other wildlife observation" includes visitors who come enjoy the auto tour and to view deer and river otters. "Other recreation" includes joggers and bikers.

Table 3-27. Muscatatuck NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	250	250	500
Observation Platforms	240	60	300
Birding	10,800	43,200	54,000
Other Wildlife Observation	28,800	7,200	36,000
Beach /Water Use	0	0	0
Other Recreation	294	6	300
Hunting:			
Big Game	800	2,400	3,200
Small Game	560	140	700
Migratory Birds	0	0	0
Fishing:			
Freshwater	12,000	3,000	15,000
Saltwater	0	0	0
Total Visitation	***53,744***	***56,256***	***110,000***

Regional Economic Analysis

The economic area for the Refuge is Bartholomew, Jackson, and Jennings Counties in Indiana.. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 3-28. Total expenditures were $3.4 million with non-residents accounting for $2.9 million or 85 percent of total expenditures. Expenditures on non-consumptive activities accounted for 88 percent of all expenditures, followed by fishing and hunting at 8 and 4 percent respectively.

Table 3-28. Muscatatuck NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$139.5	$2,440.1	$2,579.6
Other Non-Consumptive	$189.5	$208.8	$398.3
Total Non-Consumptive	$329.1	$2,648.9	$2,977.9
Hunting:			
Big Game	$12.0	$109.4	$121.4
Small Game	$4.1	$5.5	$9.6
Migratory Birds	—	—	—
Total Hunting	$16.1	$114.9	$131.0
Fishing:			
Freshwater	$160.3	$125.0	$285.4
Saltwater	—	—	—
Total Fishing	$160.3	$125.0	$285.4
Total Expenditures	***$505.5***	***$2,888.8***	***$3,394.3***

Table 3-29 summarizes the local economic effects associated with recreation visits. Final demand totaled $3.1 million with associated employment of 48 jobs, $1.3 million in employment income and $420,600 in total tax revenue.

Table 3-29. Muscatatuck NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$472.1	$2,636.0	$3,108.1
Jobs	8	40	48
Job Income	$213.0	$1,074.0	$1,287.0
Total Tax Revenue	$65.0	$355.6	$420.6

Table 3-30 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $21.56 means that for every $1 of budget expenditures, $21.56 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 3-30. Muscatatuck NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Muscatatuck NWR	$300.0	$3,394.3	$3,073.3	$21.56

Neal Smith National Wildlife Refuge

Description

Neal Smith National Wildlife Refuge, located just 25 minutes east of Des Moines, Iowa, was established in 1990. Its mission is to re-construct tallgrass prairie and restore oak savanna on 8,654 acres of the Walnut Creek watershed and to provide a major environmental education facility focusing on prairie, oak savanna, and human interaction.

The refuge has been designated a Fish and Wildlife Service Land Management and Research Demonstration Area. It facilitates development, testing, teaching, publishing, and demonstration of state-of-the-art management techniques for fish, wildlife, and plant conservation.

The Prairie Learning Center facilities include a visitor center with classrooms, exhibit area, theater, and bookstore. Miles of paved trails radiate from the center, and an auto tour through the 740-acre bison/elk enclosure is open all year. Teacher workshops, birding, hunting, and nature watching are some of the outdoor activities featured for thousands of visitors each year.

Area Economy

Neal Smith NWR is located near the city of De Moines, Iowa. Table 3-31 shows the area economy. The area population increased by 12.8 percent from 1995 to 2005, compared with a 3.4 percent increase for the state of Iowa and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 11.8 percent from 1995 to 2005, with the state of Iowa showing a 9.6 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by 8.6 percent over the 1995-2005 period, while the state of Iowa and the U.S. increased by 14.6 and 13.2 percent respectively.

Table 3-31. Neal Smith NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Jasper IA	37.5	6.0%	18.7	1.4%	$28,622	1.5%
Polk IA	401.8	13.5%	323.3	12.5%	$39,215	14.5%
Area Total	**439.3**	**12.8%**	**342.0**	**11.8%**	**$33,919**	**8.6%**
Iowa	2,965.5	3.4 %	1,968.2	9.6 %	$31,670	14.6 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 3-32 shows the recreation visits for Neal Smith NWR. The Refuge had 186,131 visits in 2006. Almost all of the visits were for non-consumptive recreation with non-residents accounting for 123,857 visits, or 67 percent of all Refuge visits.

Table 3-32. Neal Smith NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	37,975	88,608	126,583
Observation Platforms	0	0	0
Birding	5,125	7,688	12,813
Other Wildlife Observation	18,214	27,321	45,535
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	320	80	400
Small Game	640	160	800
Migratory Birds	0	0	0
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	***62,274***	***123,857***	***186,131***

Regional Economic Analysis

The economic area for the Refuge is Jasper and Polk Counties, Iowa. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 3-33. Total expenditures were $2.3 million with non-residents accounting for $2.1 million or 90 percent of total expenditures. Expenditures on non-consumptive activities accounted for 99 percent of all expenditures.

Table 3-33. Neal Smith NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$22.07	$144.74	$166.82
Other Non-Consumptive	$202.77	$1,925.49	$2,128.26
Total Non-Consumptive	$224.84	$2,070.23	$2,295.07
Hunting:			
Big Game	$4.8	$3.6	$8.5
Small Game	$4.7	$6.3	$10.9
Migratory Birds	–	–	–
Total Hunting	$9.5	$9.9	$19.4
Fishing:			
Freshwater	–	–	–
Saltwater	–	–	–
Total Fishing	–	–	–
Total Expenditures	***$234.3***	***$2,080.1***	***$2,314.5***

Table 3-34 summarizes the local economic effects associated with recreation visits. Final demand totaled $2.5 million with associated employment of 36 jobs, $982,200 in employment income and $325,400 in total tax revenue.

Table 3-34. Neal Smith NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$243.9	$2,216.6	$2,460.5
Jobs	4	32	36
Job Income	$110.2	$872.0	$982.2
Total Tax Revenue	$33.7	$291.7	$325.4

Table 3-35 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $4.00 means that for every $1 of budget expenditures, $4.00 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 3-35. Neal Smith NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Neal Smith NWR	$1,046.0	$2,314.5	$1,874.0	$4.00

Ottawa National Wildlife Refuge

Description

The Ottawa National Wildlife Refuge was established in 1961 to preserve habitat for migrating birds. The Lake Erie Marsh Region has historically been important to fish, migratory waterfowl, songbirds, and shorebirds. Up to 70 percent of the Mississippi Flyway population of black ducks can be found in the Lake Erie marshes during the fall migration. Large numbers of migrating songbirds stop in the area to rest during their spring migration. This amazing wildlife spectacle attracts a large number of visitors from across the country.

Ottawa Refuge has been designated as a site of regional significance in the Western Hemisphere Shorebird Reserve Network. In 2002, "Birders World" readers voted the refuge as one of their Top 15 favorite spots to see birds, and the American Bird Conservancy has identified the refuge as an Important Bird Area.

Area Economy

Ottawa NWR is located in northcentral Ohio near the Michigan border. Table 3-36 shows the area economy. The area population decreased by 2.1 percent from 1995 to 2005, compared with a 2.4 percent increase for the state of Ohio and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 1.8 percent from 1995 to 2005, with the state of Ohio showing a 7.2 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by 4.6 percent over the 1995-2005 period, while the state of Ohio and the U.S. increased by 7.3 and 13.2 percent respectively.

Table 3-36. Ottawa NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Lucas OH	447.4	-2.5%	280.8	1.3%	$31,045	2.6%
Ottawa OH	41.4	2.4%	20.5	8.2%	$32,095	6.6%
Area Total	**488.8**	**-2.1%**	**301.3**	**1.8%**	**$31,570**	**4.6%**
Ohio	11,470.7	2.4%	6,794.0	7.2%	$31,860	7.3%
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 3-37 shows the recreation visits for Ottawa NWR. The Refuge had 177,529 visits in 2006. Almost all of the visits were for non-consumptive recreation with non-residents accounting for 123,921 visits, or 70 percent of Refuge visits. Visitors enjoy driving the entrance road in the evening to view deer and other wildlife.

Table 3-37. Ottawa NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	22,313	52,065	74,378
Observation Platforms	6,694	15,619	22,313
Birding	20,418	47,643	68,061
Other Wildlife Observation	3,540	8,260	11,800
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	56	169	225
Small Game	28	0	28
Migratory Birds	468	156	624
Fishing:			
Freshwater	90	10	100
Saltwater	0	0	0
Total Visitation	***53,608***	***123,921***	***177,529***

Regional Economic Analysis

The economic area for the Refuge is Lucas and Ottawa Counties in Ohio. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 3-38. Total expenditures were $3.5 million with non-residents accounting for $3.2 million or 91 percent of total expenditures. Non-consumptive activities accounted for 99 percent of all expenditures.

Table 3-38. Ottawa NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$175.9	$1,794.0	$1,969.9
Other Non-Consumptive	$133.4	$1,360.6	$1,494.0
Total Non-Consumptive	$309.3	$3,154.6	$3,463.8
Hunting:			
Big Game	$1.1	$10.3	$11.4
Small Game	$0.1	–	$0.1
Migratory Birds	$6.0	$9.6	$15.6
Total Hunting	$7.3	$19.8	$27.1
Fishing:			
Freshwater	$0.5	$0.2	$0.6
Saltwater	–	–	–
Total Fishing	$0.5	$0.2	$0.6
Total Expenditures	***$317.0***	***$3,174.6***	***$3,491.5***

Table 3-39 summarizes the local economic effects associated with recreation visits. Final demand totaled $5.0 million with associated employment of 13 jobs, $1.5 million in employment income and $681,600 in total tax revenue.

Table 3-39. Ottawa NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$461.6	$4,546.6	$5,008.3
Jobs	6	7	13
Job Income	$137.8	$1,330.6	$1,468.4
Total Tax Revenue	$64.1	$617.4	$681.6

Table 3-40 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $20.79 means that for every $1 of budget expenditures, $20.79 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. Ottawa NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Ottawa NWR	$300.0	$3,491.5	$2,746.6	$20.79

Sherburne National Wildlife Refuge

Description

Sherburne National Wildlife Refuge is located in the east central region of the state, approximately 50 miles northwest of the Minneapolis/St. Paul metropolitan area and 30 miles southeast of St. Cloud. The refuge protects 30,665 acres of habitat for migratory birds and other wildlife.

The primary mission of the refuge is to represent a diverse biological community characteristic of the transition zone between tallgrass prairie and forest. Established in 1965 to protect and restore the habitats associated with the St. Francis River Valley, refuge management today focuses on the restoration of oak savanna, wetland and big woods habitats.

Area Economy

Sherburne NWR is located in eastcentral Minnesota. Table 3-41 shows the area economy. The area population increased by 24.1 percent from 1995 to 2005, compared with a 10.0 percent increase for the state of Minnesota and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 40.3 percent from 1995 to 2005, with the state of Minnesota showing a 16.0 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by12.9 percent over the 1995-2005 period, while the state of Minnesota and the U.S. increased by 17.3 and 13.2 percent respectively.

Table 3-41. Sherburne NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Anoka MN	323.4	18.4%	160.8	33.9%	$34,875	15.8%
Benton MN	38.5	19.4%	26.8	62.2%	$28,612	18.5%
Sherburne MN	81.8	57.2%	33.0	60.4%	$27,530	4.6%
Area Total	**443.7**	**24.1%**	**220.6**	**40.3%**	**$30,339**	**12.9%**
Minnesota	5,126.7	10.0 %	3,498.6	16.0 %	$37,290	17.3 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 3-42 shows the recreation visits for Sherburne NWR. The Refuge had 91,426 visits in 2006. Non-consumptive recreation accounted for 79,926 visits, hunting for 8,849s visits and fishing for 2,651 visits. Residents account for 67 percent of Refuge visits.

Table 3-42. Sherburne NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	23,489	10,067	33,556
Observation Platforms	3,485	1,493	4,978
Birding	23,254	9,966	33,220
Other Wildlife Observation	235	101	336
Beach /Water Use	0	0	0
Other Recreation	5,485	2,351	7,836
Hunting:			
Big Game	1,879	2,819	4,698
Small Game	957	1,436	2,393
Migratory Birds	703	1,055	1,758
Fishing:			
Freshwater	1,591	1,060	2,651
Saltwater	0	0	0
Total Visitation	***61,078***	***30,348***	***91,426***

Regional Economic Analysis

The economic area for the Refuge is Anoka, Benton and Sherburne Counties in Minnesota. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2006 are shown in Table 3-43. Total expenditures were $1.1 million with non-residents accounting for $780,700 or 72 percent of total expenditures. Expenditures on non-consumptive activities accounted for 62 percent of all expenditures, followed by hunting and fishing at 31 and 7 percent respectively.

Table 3-44 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.1 million with associated employment of 19 jobs, $493,700 in employment income and $166,700 in total tax revenue.

Table 3-43. Sherburne NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$100.2	$187.6	$287.9
Other Non-Consumptive	$133.3	$249.8	$383.0
Total Non-Consumptive	$233.5	$437.4	$670.9
Hunting:			
Big Game	$28.3	$128.5	$156.7
Small Game	$10.5	$84.3	$94.8
Migratory Birds	$10.9	$77.5	$88.4
Total Hunting	$49.6	$290.3	$339.9
Fishing:			
Freshwater	$25.5	$53.0	$78.5
Saltwater	–	–	–
Total Fishing	$25.5	$53.0	$78.5
Total Expenditures	***$308.6***	***$780.7***	***$1,089.3***

Table 3-44. Sherburne NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$300.7	$782.4	$1,083.1
Jobs	6	13	19
Job Income	$185.8	$307.8	$493.7
Total Tax Revenue	$48.1	$118.6	$166.7

Table 3-45 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $1.35 means that for every $1 of budget expenditures, $1.35 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. Sherburne NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Sherburne NWR	$1,779.2	$1,089.3	$1,311.9	$1.35

Shiawassee National Wildlife Refuge

Description

Shiawassee National Wildlife Refuge is located in central lower Michigan, approximately 25 miles south of Saginaw Bay. It was established in 1953 to provide habitat for migratory waterfowl.

Known locally as the "Shiawassee Flats," the refuge lies in the Saginaw Bay watershed, historically one of the largest and most productive wetland ecosystems in Michigan. Four rivers converge on the refuge, including the Tittabawassee, Flint, Cass, and Shiawassee Rivers.

Area Economy

Shiawassee NWR is located in central lower Michigan. Table 3-46 shows the area economy. The county population decreased by 2.0 percent from 1995 to 2005, compared with a 4.4 percent increase for the state of Michigan and a 11.4 percent increase for the U.S. as a whole. County employment decreased by 0.8 percent from 1995 to 2005, with the state of Michigan showing a 6.7 percent increase and the U.S. a 17.0 percent increase. Per capita income in the county increased by 0.1 percent over the 1995-2005 period, while the state of Michigan and the U.S. increased by 5.7 and 13.2 percent respectively.

Table 3-46. Shiawassee NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Saginaw MI	207.8	-2.0%	112.8	-0.8%	$27,256	0.1%
Michigan	10,100.8	4.4 %	5,518.9	6.7 %	$32,804	5.7 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 3-47 shows the recreation visits for Shiawassee NWR. The Refuge had 117,520 visits in 2006. Non-consumptive recreation totaled 109,748 visits , hunting 2,238 and fishing 5,534. Residents accounted for 83,402, or 71 percent of all Refuge visits.

Table 3-47. Shiawassee NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	32,103	13,759	45,862
Observation Platforms	7,000	3,000	10,000
Wildlife Observation	32,103	13,759	45,862
Beach /Water Use	0	0	0
Other Recreation	6,419	1,605	8,024
Hunting:			
Big Game	1,065	710	1,775
Small Game	54	26	80
Migratory Birds	230	153	383
Fishing:			
Freshwater	4,427	1,107	5,534
Saltwater	0	0	0
Total Visitation	***83,402***	***34,118***	***117,520***

Regional Economic Analysis

The economic area for the Refuge is Saginaw County Michigan It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 3-48. Total expenditures were $1.0 million with non-residents accounting for $652,400 or 63 percent of total expenditures. Expenditures on non-consumptive activities accounted for 87 percent of all expenditures, followed by hunting and fishing at 7 and 6 percent respectively.

Table 3-49 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.0 million with associated employment of 15 jobs, $427,800 in employment income and $140,800 in total tax revenue.

Table 3-48. Shiawassee NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:	$319.2	$576.5	$895.8
Hunting:			
Big Game	$18.7	$37.8	$56.4
Small Game	$0.4	$1.0	$1.4
Migratory Birds	$3.0	$9.4	$12.3
Total Hunting	$22.0	$48.2	$70.2
Fishing:			
Freshwater	$35.5	$27.7	$63.2
Saltwater	–	–	–
Total Fishing	$35.5	$27.7	$63.2
Total Expenditures	***$376.8***	***$652.4***	***$1,029.2***

Table 3-49. Shiawassee NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$362.6	$637.2	$999.8
Jobs	6	9	15
Job Income	$169.5	$258.2	$427.8
Total Tax Revenue	$52.6	$88.2	$140.8

Table 3-50 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $2.42 means that for every $1 of budget expenditures, $2.42 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 3-50. Shiawassee NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Shiawassee NWR	$999.4	$1,029.2	$1,384.6	$2.42

St. Croix Wetland Management District

Description

Lying along the eastern edge of the tallgrass prairie in west-central Wisconsin, the St. Croix Wetland Management District encompasses a fascinating diversity of habitats. Within the eight-county district, one can travel north through the high river bluffs of Pepin County, to the prairie potholes of St. Croix County, and then to the pine barrens of Burnett County.

The district includes Barron, Burnett, Dunn, Washburn, Pierce, Pepin, Polk, and St. Croix counties. The central portion of St. Croix County, the heart of the district, is known as the Star Prairie Pothole Grasslands. These grasslands are ranked sixth out of 26 priority grassland landscapes in Wisconsin.

The district manages relatively small tracts of prairie wetland and grassland habitats known as waterfowl production areas (WPAs). WPAs are purchased using Federal Duck Stamp dollars within the historic prairie pothole portion of the district, including southern Polk, St. Croix and Dunn counties. After purchase, prairie wetland and grassland habitats are restored and then managed for breeding waterfowl, other migratory birds, and indigenous wildlife.

The district's 41 WPAs totaling 7,500 acres are administered by the U.S. Fish and Wildlife Service's National Wildlife Refuge System. In addition to managing WPAs, district staff provide assistance to private landowners who wish to manage their land to benefit wildlife.

The St. Croix Wetland Management District is adjacent to the Minneapolis/St. Paul Metropolitan Area of two million people. This dynamic presents unique opportunities and challenges for prairie wetland habitat preservation, restoration and management.

Area Economy

St. Croix WMD is located in westcentral Wisconsin. Table 3-51 shows the area economy. The area population increased by 17.0 percent from 1995 to 2005, compared with a 6.6 percent increase for the state of Wisconsin and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 19.1 percent from 1995 to 2005, with the state of Wisconsin showing a 12.6 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by 15.3 percent over the 1995-2005 period, while the state of Wisconsin and the U.S. increased by13.5 and 13.2 percent respectively.

Table 3-51. St. Croix WMD:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
8 County Area	288.4	17.0%	153.5	19.1%	$27,579	15.3%
Wisconsin	5,527.6	6.6 %	3,535.7	12.6 %	$33,278	13.5 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 3-52 shows the recreation visits for St. Croix WMD. The WMD had 16,221 visits in 2006. Almost all of the visits were for hunting activities, with 15,100 visits. Residents accounted for 15,449 visits.

Table 3-52. St. Croix WMD: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	67	4	71
Observation Platforms	0	0	0
Birding	27	3	30
Other Wildlife Observation	20	0	20
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	6,650	350	7,000
Small Game	4,750	250	5,000
Migratory Birds	2,945	155	3,100
Fishing:			
Freshwater	990	10	1,000
Saltwater	0	0	0
Total Visitation	***15,449***	***772***	***16,221***

Regional Economic Analysis

The economic area for the Refuge is St. Croix, Polk, Dunn, Burnett, Washburn, Barron, Pierce, and Pepin Counties in Wisconsin. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 3-53. Total expenditures were $314,800 with residents accounting for $262,900 or 84 percent of total expenditures. Expenditures on hunting activities accounted for 94 percent of all expenditures, followed by fishing and non-consumptive activities at 5 and less than 1 percent respectively.

Table 3-53. St. Croix WMD: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$0.3	$0.2	$0.5
Other Non-Consumptive	$0.5	$0.1	$0.6
Total Non-Consumptive	$0.9	$0.3	$1.2
Hunting:			
Big Game	$133.4	$21.3	$154.6
Small Game	$52.1	$14.7	$66.8
Migratory Birds	$60.6	$15.2	$75.8
Total Hunting	$246.1	$51.1	$297.3
Fishing:			
Freshwater	$15.9	$0.5	$16.4
Saltwater	–	–	–
Total Fishing	$15.9	$0.5	$16.4
Total Expenditures	***$262.9***	***$51.9***	***$314.8***

Table 3-54 summarizes the local economic effects associated with recreation visits. Final demand totaled $282,500 with associated employment of 6 jobs, $123,500 employment income and $42,500 in total tax revenue.

Table 3-54. St. Croix WMD: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$230.9	$51.6	$282.5
Jobs	5	1	6
Job Income	$104.1	$19.4	$123.5
Total Tax Revenue	$35.2	$7.3	$42.5

Table 3-55 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $1.49 means that for every $1 of budget expenditures, $1.49 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. St. Croix WMD: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
St. Croix WMD	$706.5	$314.8	$736.2	$1.49

Tamarac National Wildlife Refuge

Description

Tamarac National Wildlife Refuge covers 42,724 acres and lies in the glacial lake country of northwestern Minnesota in Becker County, 18 miles northeast of Detroit Lakes. It was established in 1938 as a refuge breeding ground for migratory birds and other wildlife.

Refuge topography consists of rolling forested hills interspersed with lakes, rivers, marshes, bogs and shrub swamps. The token of the refuge is the tamarac tree. This unusual tree is a deciduous conifer, turning a brilliant gold before losing its needles each fall.

Tamarac lies in the heart of one of the most diverse vegetative transition zones in North America, where northern hardwood forests, coniferous forests and the tall grass prairie converge. This diversity of habitat brings with it a wealth of wildlife, both woodland and prairie species.

An attractive visitor center offers a spectacular vista of the marshes and trees that are typical of the Tamarac Refuge. A theater presentation provides orientation to the life and legends of this unique area.

Area Economy

Tamarac NWR is located in northwestern Minnesota. Table 3-56 shows the area economy. The area population increased by 11.3 percent from 1995 to 2005, compared with a 10.0 percent increase for the state of Minnesota and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 30.8 percent from 1995 to 2005, with the state of Minnesota showing a 16.0 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 23.7 percent over the 1995-2005 period, while the state of Minnesota and the U.S. increased by 17.3 and 13.2 percent respectively.

Table 3-56. Tamarac NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Becker MN	31.9	10.0%	22.4	44.8%	$28,968	30.0%
Hubbard MN	18.8	13.7%	8.0	3.0%	$26,208	17.5%
Area Total	**50.7**	**11.3%**	**30.5**	**30.8%**	**$27,588**	**23.7%**
Minnesota	5,126.7	10.0 %	3,498.6	16.0 %	$37,290	17.3 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 3-57 shows the recreation visits for Tamarac NWR . The Refuge had 79,594 visits in 2006. Non-consumptive recreation accounted for 68,969 visits, hunting accounted for 6,625 and fishing 4,000 visits. Non-residents accounted for 59 percent of Refuge visits.

Table 3-57. Tamarac NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	2,400	3,600	6,000
Observation Platforms	320	480	800
Birding	4,500	10,500	15,000
Other Wildlife Observation	12,680	19,020	31,700
Beach /Water Use	150	50	200
Other Recreation	7,635	7,635	15,269
Hunting:			
Big Game	1,900	1,900	3,800
Small Game	650	650	1,300
Migratory Birds	610	915	1,525
Fishing:			
Freshwater	2,000	2,000	4,000
Saltwater	0	0	0
Total Visitation	***32,845***	***46,750***	***79,594***

Regional Economic Analysis

The economic area for the Refuge is Becker and Hubbard Counties in Minnesota. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 3-58. Total expenditures were $1.2 million with non-residents accounting for $1.1 million or 86 percent of total expenditures. Expenditures on non-consumptive activities accounted for 75 percent of all expenditures, followed by hunting and fishing at 18 and 7 percent respectively.

Table 3-58. Tamarac NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$29.1	$296.5	$325.6
Other Non-Consumptive	$82.7	$503.2	$585.9
Total Non-Consumptive	$111.8	$799.7	$911.5
Hunting:			
Big Game	$28.6	$86.6	$115.2
Small Game	$4.8	$25.4	$30.2
Migratory Birds	$9.4	$67.3	$76.7
Total Hunting	$42.8	$179.3	$222.1
Fishing:			
Freshwater	$21.4	$66.7	$88.1
Saltwater	–	–	–
Total Fishing	$21.4	$66.7	$88.1
Total Expenditures	***$175.9***	***$1,045.7***	***$1,221.7***

Table 3-59 summarizes the local economic effects associated with recreation visits. Final demand totaled nearly $1.6 million with associated employment of 24 jobs, $491,200 in employment income and $235,600 in total tax revenue.

Table 3-59. Tamarac NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$231.8	$1,339.7	$1,571.5
Jobs	4	20	24
Job Income	$72.2	$419.0	$491.2
Total Tax Revenue	$34.9	$200.7	$235.6

Table 3-60 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $2.50 means that for every $1 of budget expenditures, $2.50 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 3-60. Tamarac NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Tamarac NWR	$934.3	$1,221.7	$1,110.3	$2.50

Trempealeau National Wildlife Refuge

Description

This 6,226-acre Refuge lies within the Mississippi flyway, along the Mississippi River in western Wisconsin. It is an isolated backwater, cut off from the Mississippi and Trempealeau rivers by dikes, providing needed resting and feeding areas for waterfowl and other birds. The Refuge is situated in a unique geological formation known as the driftless area. Thousands of years ago, glaciers surrounded but did not pass over the land. Blown into mounds, sand and silt from melting glaciers formed the rolling sand prairies of the Refuge.

Wetlands are a prominent feature. Before the railroads arrived and the locks and dams were built, the lands within the Refuge were part of the Mississippi River. As such, these backwaters experienced floods and droughts. Today, using dikes and control structures, managers can mimic this natural cycle by lowering the water to expose mudflats and allow plants to germinate. Migratory waterfowl and marsh birds benefit.

Area Economy

Trempealeau NWR is located in westcentral Wisconsin near the Minnesota border. Table 3-61 shows the area economy. The area population increased by 3.7 percent from 1995 to 2005, compared with a 6.6 percent increase for the state of Wisconsin and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 11.3 percent from 1995 to 2005, with the state of Wisconsin showing a 12.6 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 19.5 percent over the 1995-2005 period, while the state of Wisconsin and the U.S. increased by 13.5 and 13.2 percent respectively.

Table 3-61. Trempealeau NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
La Crosse WI	108.9	5.1%	83.0	12.5%	$30,874	12.6%
Winona MN	49.3	-0.2%	32	4.6%	$28,943	15.8%
Trempealeau WI	27.8	7.0%	17	8.2%	$28,161	21.7%
Buffalo WI	14.0	2.1%	10.7	31.5%	$33,199	28.6%
Area Total	200.0	3.7%	143.3	11.3%	$30,294	19.5%
Wisconsin	5,527.6	6.6%	3,535.7	12.6%	$33,278	13.5%
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 3-62 shows the recreation visits for Trempealeau NWR. The Refuge had 100,597 visits in 2006. Non-consumptive recreation accounted for 100,010 visits with residents comprising 75 percent of Refuge visitation.

Table 3-62. Trempealeau NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	4,575	1,525	6,100
Observation Platforms	41,906	13,969	55,875
Birding	7,725	2,575	10,300
Other Wildlife Observation	20,723	6,908	27,630
Beach /Water Use	79	26	105
Other Recreation	0	0	0
Hunting:			
Big Game	47	16	62
Small Game	221	25	245
Migratory Birds	10	30	40
Fishing:			
Freshwater	216	24	240
Saltwater	0	0	0
Total Visitation	***75,501***	***25,097***	***100,597***

Regional Economic Analysis

The economic area for the Refuge is Trempealeau, La Crosse and Buffalo Counties in Minnesota and Winona County in Minnesota. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2006 are shown in Table 3-63. Total expenditures were $804,600 with non-residents accounting for $476,200 or 59 percent of total expenditures. Expenditures on non-consumptive activities accounted for 99 percent of all expenditures.

Table 3-63. Trempealeau NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$33.3	$48.5	$81.8
Other Non-Consumptive	$290.1	$422.8	$712.9
Total Non-Consumptive	$323.4	$471.3	$794.7
Hunting:			
Big Game	$0.7	$0.7	$1.4
Small Game	$2.4	$1.4	$3.9
Migratory Birds	$0.2	$2.2	$2.4
Total Hunting	$3.3	$4.4	$7.6
Fishing:			
Freshwater	$1.7	$0.6	$2.3
Saltwater	–	–	–
Total Fishing	$1.7	$0.6	$2.3
Total Expenditures	***$328.4***	***$476.2***	***$804.6***

Table 3-64 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.0 million with associated employment of 16 jobs, $320,900 in employment income and $154,800 in total tax revenue.

Table 3-64. Trempealeau NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$432.4	$604.7	$1,037.1
Jobs	7	9	16
Job Income	$134.1	$186.8	$320.9
Total Tax Revenue	$64.8	$90.0	$154.8

Table 3-65 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $6.52 means that for every $1 of budget expenditures, $6.52 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 3-65. Trempealeau NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Trempealeau NWR	$300.0	$804.6	$1,152.8	$6.52

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:

Cross Creeks NWR (Tennessee)
Pocosin Lakes NWR (North Carolina)
St. Marks NWR (Florida)
Tensas River NWR (Louisiana)
Waccamaw NWR (South Carolina)
Wheeler NWR (Alabama)
White River NWR (Arkansas)

Cross Creeks National Wildlife Refuge

Description

Cross Creeks National Wildlife Refuge Cross Creeks NWR is located four miles east of Dover, in Stewart County, Tennessee and approximately seventy-five miles northwest of Nashville, Tennessee. The refuge was established in 1962 as a result of mitigation proceedings with the U.S. Army Corps of Engineers when portion of the Kentucky Woodlands NWR was inundated with the creation of the Lake Barkley Project. Its primary purpose is to provide feeding and resting habitat for migratory birds with an emphasis placed on providing habitat for wintering waterfowl.

Area Economy

Cross Creeks NWR is located in northern Tennessee near the Kentucky border. Table 4-1 shows the area economy. The area population increased by 24.8 percent from 1995 to 2005, compared with a 11.8 percent increase for the state of Tennessee and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 31.7 percent from 1995 to 2005, with the state of Tennessee showing a 14.8 percent increase and the U.S. a 17.0 percent increase. Per capita income in the area increased by 15.4 percent over the 1995-2005 period, while the state of Tennessee and the U.S. increased by10.8 and 13.2 percent respectively.

Table 4-1. Cross Creeks NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Stewart TN	13.0	20.1%	4.2	8.3%	$23,341	9.9%
Montgomery TN	146.8	25.2%	61.5	33.7%	$31,812	19.8%
Area Total	**159.8**	**24.8%**	**65.7**	**31.7%**	**$27,577**	**15.4%**
Tennessee	5,955.7	11.8 %	3,630.9	14.8 %	$30,969	10.8 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 4-2 shows the recreation visits for Cross Creeks NWR. The Refuge had 37,981 visits in 2006. Fishing accounted for 26,550 visits, non-consumptive recreation 10,585 visits, and hunting 846 visits. Residents accounted for 30,593 visits, or 81 percent of Refuge visits.

Table 4-2. Cross Creeks NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	405	45	450
Observation Platforms	0	0	0
Birding	1,250	1,250	2,500
Other Wildlife Observation	1,690	910	2,600
Beach /Water Use	2,679	2,192	4,870
Other Recreation	99	66	165
Hunting:			
Big Game	381	205	586
Small Game	83	28	110
Migratory Birds	113	38	150
Fishing:			
Freshwater	23,895	2,655	26,550
Saltwater	0	0	0
Total Visitation	***30,593***	***7,388***	***37,981***

Regional Economic Analysis

The economic area for the Refuge is Stewart and Montgomery Counties in Tennessee. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 4-3. Total expenditures were $727,100 with residents accounting for $399,600 or 55 percent of total expenditures. Fishing accounted for 63 percent of all expenditures, followed by non-consumptive activities and hunting at 35 and 2 percent respectively.

Table 4-3. Cross Creeks NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$15.83	$78.88	$94.70
Other Non-Consumptive	$35.85	$124.63	$160.48
Total Non-Consumptive	$51.68	$203.50	$255.18
Hunting:			
Big Game	$4.0	$5.4	$9.3
Small Game	$0.5	$1.2	$1.7
Migratory Birds	$1.6	$1.2	$2.8
Total Hunting	$6.0	$7.8	$13.8
Fishing:			
Freshwater	$341.9	$116.1	$458.0
Saltwater	—	—	—
Total Fishing	$341.9	$116.1	$458.0
Total Expenditures	***$399.6***	***$327.4***	***$727.1***

Table 4-4 summarizes the local economic effects associated with recreation visits. Final demand totaled $643,000 with associated employment of 12 jobs, $276,700 in employment income and $84,500 in total tax revenue.

Table 4-4. Cross Creeks NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$346.2	$296.8	$643.1
Jobs	7	5	12
Job Income	$158.9	$117.8	$276.7
Total Tax Revenue	$46.4	$38.1	$84.5

Table 4-5 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $2.09 means that for every $1 of budget expenditures, $2.09 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 4-5. Cross Creeks NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Cross Creeks NWR	$959.3	$727.1	$1,276.3	$2.09

Noxubee National Wildlife Refuge

Description

Noxubee National Wildlife Refuge is located in three counties (Noxubee, Oktibbeha, and Winston) and was originally created from lands obtained through the 1930's Resettlement Administration. With additional land acquisitions through the years, Noxubee now consists of 48,000 acres. Approximately 44,500 acres of the refuge is bottomland and upland forest. These forest lands are occupied by a variety of game species, including quail, deer, and turkey. The endangered red-cockaded woodpecker relies on the Refuge for its existence in east-central Mississippi. In addition, many neotropic bird species inhabit the Noxubee forests. Four green-tree reservoirs, two major lakes (Bluff and Loakfoma), 16 small impoundments, and assorted wetland areas provide important habitat for wood stork, American alligator, bald eagle and wintering waterfowl.

Area Economy

Noxubee NWR is located on the coast in Mississippi. Table 4-6 shows the area economy. The area population increased by 0.2 percent from 1995 to 2005, compared with a 6.8 percent increase for the state of Mississippi and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 14.6 percent from 1995 to 2005, with the state of Mississippi showing a 9.6 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 16.6 percent, Mississippi increased by 12.4 percent and the U.S increased 13.2 percent.

Table 4-6. Noxubee NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Noxubee MS	12.1	-2.7%	4.9	1.6%	$18,950	11.7%
Oktibbeha MS	41.3	1.6%	25.1	24.4%	$24,520	26.2%
Winston MS	19.8	-1.0%	8.2	-1.5%	$21,220	11.2%
Area Total	73.2	0.2%	38.2	14.6%	$21,563	16.6%
Mississippi	2,908.5	6.8%	1,505.9	9.6%	$25,051	12.4%
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 4-7 shows the recreation visits for Noxubee NWR. The Refuge had 143,255 visits in 2006. Almost all of the visits were for non-consumptive recreation.

Table 4-7. Noxubee NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	14,130	32,970	47,100
Observation Platforms	12,020	18,030	30,050
Birding	4,000	6,000	10,000
Other Wildlife Observation	1,973	4,603	6,575
Beach /Water Use	300	200	500
Other Recreation	5,802	3,868	9,670
Hunting:			
Big Game	5,810	8,715	14,525
Small Game	4,532	6,798	11,330
Migratory Birds	123	492	615
Fishing:			
Freshwater	10,957	1,934	12,890
Saltwater	0	0	0
Total Visitation	***59,646***	***83,609***	***143,255***

Regional Economic Analysis

The economic area for the Refuge is a three county area in Mississippi. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2006 are shown in Table 4-3. Total expenditures were $2.9 million with non-residents accounting for $2.5 million or 86 percent of total expenditures. Expenditures on non-consumptive activities accounted for 65 percent of all expenditures, followed by hunting and fishing at 30 and 5 percent respectively.

Table 4-8. Noxubee NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$33.8	$252.4	$286.2
Other Non-Consumptive	$161.8	$1,455.0	$1,616.8
Total Non-Consumptive	$195.5	$1,707.4	$1,903.0
Hunting:			
Big Game	$91.0	$342.4	$433.3
Small Game	$31.3	$383.4	$414.7
Migratory Birds	$2.1	$18.9	$21.0
Total Hunting	$124.4	$744.7	$869.0
Fishing:			
Freshwater	$104.5	$56.4	$160.9
Saltwater	–	–	–
Total Fishing	$104.5	$56.4	$160.9
Total Expenditures	***$424.4***	***$2,508.5***	***$2,932.9***

Table 4-9 summarizes the local economic effects associated with recreation visits. Final demand totaled $2.6 million with associated employment of 59 jobs, $978,100 in employment income and $327,200 in total tax revenue.

Table 4-9. Noxubee NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$353.0	$2,260.9	$2,613.9
Jobs	11	48	59
Job Income	$154.7	$823.5	$978.1
Total Tax Revenue	$46.8	$280.3	$327.2

Table 4-10shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $4.34 means that for every $1 of budget expenditures, $4.34 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 4-10. Noxubee NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Noxubee NWR	$1,296.0	$2,932.9	$2,697.5	$4.34

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 113,000 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 eastern North Carolina. Table 4-11 shows the area economy. The area population decreased by 2.8 percent from 1995 to 2005, compared with a 18.1 percent increase for the state of North Carolina and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 9.5 percent from 1995 to 2005, with the state of North Carolina showing a 16.9 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 13.3 percent over the 1995-2005 period, while the state of North Carolina and the U.S. increased by 10.4 and 13.2 percent respectively.

Table 4-11. Pocosin Lakes NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Tyrell NC	4.1	7.7%	1.7	22.2%	$22,329	17.4%
Hyde NC	5.4	1.4%	3.3	11.8%	$23,692	15.6%
Washington NC	13.3	-7.2%	5.1	4.6%	$23,858	7.7%
Area Total	**22.9**	**-2.8%**	**10.1**	**9.5%**	**$23,293**	**13.3%**
North Carolina	8,672.5	18.1 %	5,119.5	16.9 %	$31,041	10.4 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 4-12 shows the recreation visits for Pocosin Lakes NWR. The Refuge had 82,800 visits in 2006. Non-consumptive recreation accounted for 76,500 visits, hunting 5,300 visits, and fishing 1,000 visits. Non-residents comprised 93 percent of all Refuge visits.

Table 4-12. Pocosin Lakes NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	1,600	14,400	16,000
Observation Platforms	400	3,600	4,000
Birding	50	9,950	10,000
Other Wildlife Observation	600	5,400	6,000
Beach /Water Use	0	0	0
Other Recreation	1,215	39,285	40,500
Hunting:			
Big Game	800	3,200	4,000
Small Game	240	360	600
Migratory Birds	70	630	700
Fishing:			
Freshwater	950	50	1,000
Saltwater	0	0	0
Total Visitation	***5,925***	***76,875***	***82,800***

Regional Economic Analysis

The economic area for the Refuge is Tyrell, Hyde and Washington Counties in North Carolina.. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2006 are shown in Table 4-13. Total expenditures were $1.5 million with non-residents accounting for $1.4 million or 97 percent of total expenditures. Expenditures on non-consumptive activities accounted for 85 percent of all expenditures, followed by hunting and fishing at 15 and less than 1 percent respectively.

Table 4-13. Pocosin Lakes NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$0.3	$313.9	$314.2
Other Non-Consumptive	$14.0	$924.3	$938.2
Total Non-Consumptive	$14.3	$1,238.2	$1,252.5
Hunting:			
Big Game	$16.7	$167.6	$184.3
Small Game	$1.3	$16.2	$17.6
Migratory Birds	$0.8	$16.1	$16.9
Total Hunting	$18.8	$200.0	$218.8
Fishing:			
Freshwater	$9.1	$1.5	$10.5
Saltwater	–	–	–
Total Fishing	$9.1	$1.5	$10.5
Total Expenditures	***$42.2***	***$1,439.7***	***$1,481.8***

Table 4-14 summarizes the local economic effects associated with recreation visits. Final demand totaled $903,800 with associated employment of 14 jobs, $256,000 in employment income and $109,900 in total tax revenue.

Table 4-14. Pocosin Lakes NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$18.5	$885.3	$903.8
Jobs	1	13	14
Job Income	$5.7	$250.3	$256.0
Total Tax Revenue	$2.4	$107.5	$109.9

Table 4-15 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $1.29 means that for every $1 of budget expenditures, $1.29 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 4-15. Pocosin Lakes NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Pocosin Lakes NWR	$1,903.5	$1,481.8	$964.7	$1.29

St. Marks National Wildlife Refuge

Description

St. Marks NWR, located 25 miles south of Tallahassee along the Gulf Coast of Florida, is a well-known oasis of natural Florida habitats for wildlife, especially birds. Natural salt marshes, freshwater swamps, pine forests and lakes provide a haven for wildlife and people.

Established in 1931 for wintering migratory birds, St. Marks NWR has a long tradition of excellent birdwatching. There are over 300 species of birds recorded on the refuge, with 98 species nesting on-site. There are 19 species of ducks and many hawks, falcons, and shorebirds migrating through the refuge in the fall and winter. There are 14 active bald eagle nests and the endangered least tern and red-cockaded woodpecker also nest on the refuge.

In the spring, the refuge is a showcase of colors as songbirds migrate north through coastal oaks and shrubs. Wildlife abounds on St. Marks NWR due to the wide diversity of habitats, ranging from wilderness saltmarshes, ribboned with tidal creeks, to rolling longleaf pine forests, with swamps, sinkholes, and palm/oak hammocks in between. Located in Wakulla, Jefferson, and Taylor counties, the refuge spans over 43 miles of coastline and supports 52 species of mammals such as the Florida black bear and bobcat; 40 species of amphibians such as the endangered flatwoods salamander, and 65 species of reptiles.

Fishing, hiking, birdwatching, butterfly-watching, hunting, and viewing the historic St. Marks lighthouse on beautiful Apalachee Bay attract visitors from around the world. Special events highlighting the refuge's coastal resources, monarch butterflies, wildflowers and migratory birds enhance visitors' opportunities to learn more about this special place.

Visitors may glimpse endangered loggerhead sea turtles and West Indian manatees offshore by the lighthouse. State-listed threatened and endangered plants are also found on the refuge. St. Marks NWR's location also makes it an ideal host for the natural marvel of the migrating monarch butterflies in October on their way to Mexico.

Area Economy

St. Marks NWR is located on the Gulf Coast in northern Florida. Table 4-1 shows the area economy. The area population increased by 12.7 percent from 1995 to 2005, compared with a 22.2 percent increase for the state of Florida and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 18.5 percent from 1995 to 2005, with the state of Florida showing a 34.0 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 10.5 percent over the 1995-2005 period, while the state of Florida and the U.S. increased by 13.5 and 13.2 percent respectively.

Table 4-16. St. Marks NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Leon Fl	244.2	9.6%	180.8	17.1%	$32,188	16.1%
Wakulla FL	28.2	49.3%	8.2	63.2%	$23,451	3.7%
Area Total	**272.4**	**12.7%**	**189.0**	**18.5%**	**$27,820**	**10.5%**
Florida	17,768.2	22.2 %	10,121.7	34.0 %	$34,001	13.5 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 4-17 shows the recreation visits for St. Marks NWR. The Refuge had 846,121 visits in 2006. Non-consumptive recreation accounted for 784,903 visits, or 93 percent of Refuge visits. Fishing accounted for 59,274 visits and hunting 1,944 visits. "Other wildlife viewing" includes monarch butterflies and butterfly viewing while "other recreation" includes picnicking, visitor center use, interpretation, special events and programs on-site.

Table 4-17. St. Marks NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	101,689	146,333	248,022
Observation Platforms	76,267	109,749	186,016
Birding	62,780	76,732	139,512
Other Wildlife Observation	44,489	64,021	108,510
Beach /Water Use	21,864	11,773	33,637
Other Recreation	44,984	24,222	69,206
Hunting:			
Big Game	546	1,015	1,561
Small Game	62	89	150
Migratory Birds	151	82	233
Fishing:			
Freshwater	9,376	5,048	14,424
Saltwater	29,153	15,698	44,850
Total Visitation	***391,360***	***454,761***	***846,121***

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 2006 are shown in Table 4-18. Total expenditures were $23.6 million with non-residents accounting for $19.5 million or 83 percent of total expenditures. Expenditures on non-consumptive activities accounted for 85 percent of all expenditures.

Table 4-18. St. Marks NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$794.9	$4,841.9	$5,636.8
Other Non-Consumptive	$1,970.5	$12,450.9	$14,421.4
Total Non-Consumptive	$2,765.4	$17,292.8	$20,058.2
Hunting:			
Big Game	$11.4	$53.1	$64.6
Small Game	$0.5	$6.0	$6.5
Migratory Birds	$2.2	$2.6	$4.8
Total Hunting	$14.1	$61.8	$75.8
Fishing:			
Freshwater	$111.8	$184.0	$295.8
Saltwater	$1,223.1	$1,996.7	$3,219.8
Total Fishing	$1,334.9	$2,180.7	$3,515.6
Total Expenditures	***$4,114.3***	***$19,535.2***	***$23,649.6***

Table 4-19 summarizes the local economic effects associated with recreation visits. Final demand totaled $23.9 million with associated employment of 346 jobs, $9.3 million in employment income and $3.1 million in total tax revenue.

Table 4-19. St. Marks NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$4,022.4	$19,845.5	$23,867.9
Jobs	70	276	346
Job Income	$1,734.3	$7,586.6	$9,320.9
Total Tax Revenue	$535.0	$2,522.0	$3,057.1

Table 4-20 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $8.50 means that for every $1 of budget expenditures, $8.50 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 4-20. St. Marks NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
St. Marks NWR	$5,052.2	$23,649.6	$19,280.2	$8.50

Tensas River National Wildlife Refuge

Description

Tensas River NWR is a 63,925-acre island of forest in a sea of agricultural land. It was established in 1980 to preserve the largest privately owned tract of bottomland hardwood habitat remaining in the Mississippi delta. The refuge is home to the threatened Louisiana black bear and American alligator. Human activities affect this environment tremendously.

Hunting and fishing are the largest public-use programs on the refuge. Deer, squirrel, raccoon, turkey, and waterfowl are hunted with bow and arrow, muzzleloaders, and other weapons. Special permits and training are required to hunt on the refuge. Bass and crappie are popular quarries for anglers. Several lakes are open for fishing year-round.

Much of the refuge is difficult to access on foot, limiting non-consumptive use. A hiking trail loop around Rainey Lake and a boardwalk to an observation platform receive most of the land-based attention. A primitive canoe-launch site provides water access to the river. All-terrain vehicles (ATVs) are permitted on designated trails. The refuge has a strong environmental education program. Teacher-training workshops and environmental summer camps are hosted annually.

Area Economy

Tensas River NWR is located in northeastern Louisiana. Table 4-21 shows the area economy. The area population decreased by 5.6 percent from 1995 to 2005, compared with a 2.9 percent increase for the state of Louisiana and a 11.4 percent increase for the U.S. as a whole. Area employment decreased by 0.5 percent from 1995 to 2005, with the state of Louisiana showing a 11.4 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 6.3 percent over the 1995-2005 period, while the state of Louisiana declined by 2.1 percent and the U.S. increased by 13.2 percent .

Table 4-21. Tensas River NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
Parrish	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Madison LA	12.5	-7.1%	4.9	2.7%	$18,823	6.6%
Richland LA	20.4	-1.8%	8.2	-3.4%	$21,541	2.0%
Franklin LA	20.4	-6.4%	9.0	2.7%	$20,691	6.7%
Tensas LA	6.1	-11.8%	2.5	-7.1%	$21,987	10.0%
Area Total	**59.4**	**-5.6%**	**24.5**	**-0.5%**	**$20,761**	**6.3%**
Louisiana	4,507.3	2.9 %	2,461.2	11.4 %	$24,664	-2.1 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Visitors to Tensas River NWR enjoy a variety of non-consumptive activities, hunting activities, and freshwater fishing (Table 4-22). The most popular activity was big game hunting. "Other wildlife observation" includes photography. In FY 2006, 94 percent of visits were by non-residents (74,206 visits).

Table 4-22. Tensas River NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	90	1,410	1,500
Observation Platforms	30	970	1,000
Birding	650	12,350	13,000
Other Wildlife Observation	750	14,250	15,000
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	1,750	33,250	35,000
Small Game	900	8,100	9,000
Migratory Birds	240	1,760	2,000
Fishing:			
Freshwater	184	2,116	2,300
Saltwater	0	0	0
Total Visitation	***4,594***	***74,206***	***78,800***

Regional Economic Analysis

Table 4-23 shows recreational visits to Tensas NWR resulted in nearly $2.7 million of visitor recreation expenditures in FY 2006. Hunting and non-consumptive activities generated the majority of expenditures, while freshwater fishing resulted in just 2 percent.

Table 4-23. Tensas River NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$8.2	$779.3	$787.5
Other Non-Consumptive	$5.3	$499.7	$504.9
Total Non-Consumptive	$13.5	$1,279.0	$1,292.5
Hunting:			
Big Game	$18.3	$870.8	$889.1
Small Game	$5.0	$365.4	$370.4
Migratory Birds	$2.7	$45.1	$47.8
Total Hunting	$26.0	$1,281.4	$1,307.4
Fishing:			
Freshwater	$1.8	$61.7	$63.4
Saltwater	–	–	–
Total Fishing	$1.8	$61.7	$63.4
Total Expenditures	***$41.2***	***$2,622.1***	***$2,663.3***

Table 4-24 summarizes the total economic impacts associated with refuge visitor spending. Total final demand associated with recreational visitor spending was $3.6 million. This is the total monetary value of economic activity generated in the local county area by recreational visitors. In turn, this final demand generated 51 jobs, $1.0 million in employment income, and $481,100 in total tax revenue for the state and the United States.

Table 4-24. Tensas River NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$279.6	$3,285.4	$3,565.0
Jobs	4	47	51
Job Income	$76.5	$947.3	$1,023.8
Total Tax Revenue	$34.4	$446.7	$481.1

Table 4-25 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $1.59 means that for every $1 of budget expenditures, $1.59 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 4-25. Tensas River NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Tensas River NWR	$2,893.6	$2,663.3	$1,939.3	$1.59

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-dependant 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 purchased total just under 9,000 acres.

Waccamaw NWR is one of four refuges in the Ace Basin/Cape Romain/Santee/Waccamaw NWR Complex and is presently being administered by Cape Romain NWR. Plans for refuge staffing and the construction of a refuge headquarters/ environmental education center are currently underway.

Area Economy

Waccamaw NWR is located in eastcentral South Carolina. Table 4-26 shows the area economy. The area population increased by 10.0 percent from 1995 to 2005, compared with a 13.3 percent increase for the state of South Carolina and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 21.2 percent from 1995 to 2005, with the state of South Carolina showing a 15.4 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 17.6 percent over the 1995-2005 period, while the state of South Carolina and the U.S. increased by 12.0 and 13.2 percent respectively.

Table 4-26. Waccamaw NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Georgetown SC	60.2	18.4%	34.5	36.5%	$30,399	24.2%
Marion SC	34.8	-2.0%	14.7	-4.0%	$20,485	9.0%
Area Total	**95.0**	**10.0%**	**49.1**	**21.2%**	**$25,442**	**17.6%**
South Carolina	4,246.9	13.3 %	2,366.5	15.4 %	$28,285	12.0 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 4-27 shows the recreation visits for Waccamaw NWR. The Refuge had 3,190 recreation visits in 2006. Almost all of the visits were for non-consumptive recreation with most visitors being residents.

Table 4-27. Waccamaw NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	662	14	675
Observation Platforms	0	0	0
Birding	35	15	50
Other Wildlife Observation	5	0	5
Beach /Water Use	1,558	82	1,640
Other Recreation	0	0	0
Hunting:			
Big Game	184	46	230
Small Game	35	0	35
Migratory Birds	35	0	35
Fishing:			
Freshwater	364	156	520
Saltwater	0	0	0
Total Visitation	2,878	313	3,190

It should be noted that a considerable number of recreation visits occur within Refuge boundaries, but are not counted within the above table because those visits occur on waters managed by the state of South Carolina. In addition, there are 13 boat ramps on Refuge land but which are managed by state or county agencies. The visitation numbers for Waccamaw NWR would increase significantly if these visits on state or county managed land or waters were included.

Regional Economic Analysis

The economic area for the Refuge is Georgetown and Marion Counties in South Carolina. It is assumed that visitor expenditures occur primarily within these counties. Visitor recreation expenditures for 2006 are shown in Table 4-28. Total expenditures were $27,300 with residents accounting for $18,900 or 69 percent of total expenditures. Expenditures on non-consumptive activities accounted for 59 percent of all expenditures, followed by fishing and hunting at 22 and 19 percent respectively.

Table 4-28. Waccamaw NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$0.1	$0.3	$0.5
Other Non-Consumptive	$12.7	$2.9	$15.5
Total Non-Consumptive	$12.8	$3.2	$16.0
Hunting:			
Big Game	$2.9	$1.8	$4.7
Small Game	$0.2	$0.0	$0.2
Migratory Birds	$0.4	$0.0	$0.4
Total Hunting	$3.5	$1.8	$5.3
Fishing:			
Freshwater	$2.6	$3.4	$6.0
Saltwater	$0.0	$0.0	$0.0
Total Fishing	$2.6	$3.4	$6.0
Total Expenditures	***$18.9***	***$8.4***	***$27.3***

Table 4-29 summarizes the local economic effects associated with recreation visits. Final demand totaled $31,200 with associated employment of 1 job, $10,100 in employment income and $4,900 in total tax revenue.

Table 4-29. Waccamaw NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$21.6	$9.6	$31.2
Jobs	1	0	1
Job Income	$7.1	$3.1	$10.1
Total Tax Revenue	$3.4	$1.5	$4.9

Table 4-30 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $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 4-30. Waccamaw NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Waccamaw NWR	$246.7	$27.3	$56.4	$0.34

Wheeler National Wildlife Refuge

Description

Wheeler NWR, located along the Tennessee River between Huntsville and Decatur, was established in 1938 to provide habitat for wintering and migrating birds. Considered the easternmost Refuge in the Mississippi flyway, this 34,500 acre Refuge attracts thousands of wintering waterfowl each year and supports the southernmost and Alabama's only significant concentration of wintering Southern James Bay Canada geese. It also serves as winter habitat for the State's largest duck population. In addition to migratory birds, the Refuge hosts 115 species of fish, 74 species of reptiles and amphibians, 47 species of mammals, and 285 different species of songbirds. The Refuge is also home to 10 federally listed endangered or threatened species.

Wheeler NWR is comprised of a great diversity of habitat types such as bottomland hardwoods, wetlands, pine uplands, agricultural fields, and backwater embayments. These habitats provide excellent feeding, loafing, and roosting sites for waterfowl, as well as nesting sites for migrating songbirds. The Refuge provides a much needed oasis in one of the fastest growing regions in the state, with Madison being ranked as one of the top ten fasting growing cities in the nation in 2002.

Area Economy

Wheeler NWR is located in northern Alabama near the Tennessee border. Table 4-31 shows the area economy. The area population increased by 11.5 percent from 1995 to 2005, compared with a 5.9 percent increase for the state of Alabama and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 18.2 percent from 1995 to 2005, with the state of Alabama showing a 11.3 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 11.4 percent over the 1995-2005 period, while the state of Alabama and the U.S. increased by 15.4 and 13.2 percent respectively.

Table 4-31. Wheeler NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Limestone AL	70.4	17.3%	36.7	26.6%	$26,698	8.2%
Madison AL	298.2	12.3%	209.2	20.7%	$34,987	15.1%
Morgan AL	113.8	6.1%	63.3	7.0%	$30,814	10.2%
Area Total	**482.4**	**11.5%**	**309.2**	**18.2%**	**$30,833**	**11.4%**
Alabama	4,548.3	5.9 %	2,511.3	11.3 %	$29,623	15.4 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

In FY 2006, there were 590,743 visits to Wheeler NWR. Non-consumptive activities and freshwater fishing were the most popular activities, with 47 percent and 44 percent of the activities, respectively. "Other Wildlife Observation" includes observing deer, raccoon, rabbit, coyote, and fox. "Other Recreation" includes bicycling, horseback riding, and berry picking. The majority of visits were by residents (435,085 visits).

Table 4-32. Wheeler NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	45,500	19,500	65,000
Observation Platforms	17,500	7,500	25,000
Birding	76,026	50,684	126,710
Other Wildlife Observation	22,174	9,503	31,677
Beach /Water Use	0	0	0
Other Recreation	24,045	6,011	30,056
Hunting:			
Big Game	34,978	8,744	43,722
Small Game	14,990	3,748	18,738
Migratory Birds	0	0	0
Fishing:			
Freshwater	199,872	49,968	249,840
Saltwater	0	0	0
Total Visitation	***435,085***	***155,658***	***590,743***

Regional Economic Analysis

Visitor recreation expenditures totaled nearly $12 million, with fishing related expenditures accounting for $5.9 million (49 percent). Non-consumptive related expenditures totaled $4.7 million, and hunting related expenditures totaled $1.4 million. Non-residents accounted for 55 percent ($6.6 million) of all expenditures.

Table 4-33. Wheeler NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$641.8	$2,132.2	$2,773.9
Other Non-Consumptive	$664.4	$1,283.6	$1,947.9
Total Non-Consumptive	$1,306.2	$3,415.8	$4,721.8
Hunting:			
Big Game	$638.9	$400.8	$1,039.7
Small Game	$103.5	$211.3	$314.9
Migratory Birds	–	–	–
Total Hunting	$742.4	$612.1	$1,354.6
Fishing:			
Freshwater	$3,336.8	$2,549.5	$5,886.2
Saltwater	—	—	—
Total Fishing	$3,336.8	$2,549.5	$5,886.2
Total Expenditures	**$5,385.3**	**$6,577.3**	**$11,962.7**

Table 4-34 summarizes the local economic effects associated with recreation visits. Final demand totaled $16.3 million with associated employment of 202 jobs, $5.2 million in employment income and $2.2 million in total tax revenue.

Table 4-34. Wheeler NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$7,341.7	$8,992.1	$16,333.8
Jobs	92	110	202
Job Income	$2,338.6	$2,832.5	$5,171.0
Total Tax Revenue	$1,000.4	$1,220.2	$2,220.6

Table 4-35 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $13.25 means that for every $1 of budget expenditures, $13.25 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 4-35. Wheeler NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Wheeler NWR	$2,329.6	$11,962.7	$18,899.9	$13.25

White River National Wildlife Refuge

Description

White River NWR, was established in 1935 for the protection of migratory birds. The refuge lies in the floodplain of the White River near where it meets the Mississippi River. White River NWR is one of the largest remaining bottomland hardwood forests in the Mississippi River Valley.

Approximately two-thirds of the bird species found in Arkansas can be seen at White River NWR. Many of these are neotropical migratory songbirds that use the refuge as a stopping point on their journey to and from central and south America. Arriving in early autumn and usually peaking in late December, mallards along with gadwalls, American widgeon, and greenwing teal find their way along that highway in the sky-the Mississippi Flyway. During some years, up to 350,000 birds will winter in these flooded bottomland hardwood forests.

Area Economy

White River NWR is located in eastcentral Arkansas. Table 4-36 shows the area economy. The area population decreased by 10.7 percent from 1995 to 2005, compared with a 9.5 percent increase for the state of Arkansas and a 11.4 percent increase for the U.S. as a whole. Area employment declined by 5.7 percent from 1995 to 2005, with the state of Arkansas showing a 12.0 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 4.8 percent over the 1995-2005 period, while the state of Arkansas and the U.S. increased by 11.8 and 13.2 percent respectively.

Table 4-36. White River NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Monroe AR	9.3	-12.9%	4.2	-9.5%	$20,300	0.7%
Arkansas AR	20.0	-5.1%	14.0	7.7%	$26,728	2.1%
Desha AR	14.3	-10.2%	7.3	-8.3%	$21,205	3.3%
Phillips AR	23.8	-14.4%	9.4	-17.7%	$21,196	14.8%
Area Total	**67.4**	**-10.7%**	**35.0**	**-5.7%**	**$22,357**	**4.8%**
Arkansas	2,775.7	9.5 %	1,557.8	12.0 %	$26,681	11.8 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 4-37 shows the recreation visits for White River NWR. The Refuge had 523,000 visits in 2006. Non-consumptive recreation visits totaled 401,000, followed by fishing with 65,000 visits and hunting with 57,000 visits. Residents accounted for 75 percent of all Refuge visits.

Table 4-37. White River NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	178,000	22,000	200,000
Observation Platforms	990	10	1,000
Birding	25,000	25,000	50,000
Other Wildlife Observation	75,000	75,000	150,000
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	12,350	650	13,000
Small Game	17,000	3,000	20,000
Migratory Birds	18,000	6,000	24,000
Fishing:			
Freshwater	63,700	1,300	65,000
Saltwater	0	0	0
Total Visitation	***390,040***	***132,960***	***523,000***

Regional Economic Analysis

The economic area for the Refuge is Monroe, Arkansas, Desha and Phillips Counties in Arkansas. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 4-38. Total expenditures were $11.2 million with non-residents accounting for $6.9 million or 61 percent of total expenditures. Expenditures on non-consumptive activities accounted for 83 percent of all expenditures, followed by hunting and fishing at 9 and 7 percent respectively.

Table 4-38. White River NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$263.8	$1,314.6	$1,578.4
Other Non-Consumptive	$2,671.6	$5,100.8	$7,772.5
Total Non-Consumptive	$2,935.4	$6,415.4	$9,350.9
Hunting:			
Big Game	$257.8	$34.0	$291.9
Small Game	$93.9	$135.3	$229.3
Migratory Birds	$306.8	$230.7	$537.4
Total Hunting	$658.5	$400.1	$1,058.6
Fishing:			
Freshwater	$759.6	$47.4	$807.0
Saltwater	–	–	–
Total Fishing	$759.6	$47.4	$807.0
Total Expenditures	***$4,353.5***	***$6,862.9***	***$11,216.4***

Table 4-39 summarizes the local economic effects associated with recreation visits. Final demand totaled $13.0 million with associated employment of 219 jobs, $4.1 million in employment income and $1.9 million in total tax revenue.

Table 4-39. White River NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$5,190.3	$7,855.6	$13,045.9
Jobs	84	135	219
Job Income	$1,609.0	$2,527.5	$4,136.5
Total Tax Revenue	$745.5	$1,174.0	$1,919.5

Table 4-40 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $15.58 means that for every $1 of budget expenditures, $15.58 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. White River NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
White River NWR	$1,712.2	$11,216.4	$15,456.1	$15.58

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)
Bombay Hook NWR (Delaware)
Chincoteague NWR (Virginia)
Eastern Neck NWR (Maryland)
Eastern Shore of Virginia NWR (Virginia)
Edwin B. Forsythe NWR (New Jersey)
James River NWR (Virginia)
John Heinz at Tinicum NWR (Pennsylvania)
Mason Neck NWR (Virginia)
Monomoy NWR (Massachusetts)
Ninigret NWR (Rhode Island)
Parker River NWR (Massachusetts)
Patuxent Research NWR (Maryland)
Presquile NWR (Virginia)
Stewart B. McKinney NWR (Connecticut)

Assabet River National Wildlife Refuge

Description

Assabet River NWR, formerly referred to as the U.S. Army's Fort Devens Sudbury Training Annex, is a 2,230-acre parcel of land located approximately 25 miles west of Boston, and 4 miles west of the Eastern Massachusetts NWR Complex Headquarters. It is located in portions of the Towns of Hudson, Maynard, Stow and Sudbury and covers approximately 3.5 square miles. The Assabet River NWR consists of two separate pieces of land. The larger northern section is just north of Hudson Road. The southern section is located to the south of Hudson Road. The refuge is comprised of a diverse mixture of pine/hardwood forest, old field, and wetland habitats.

On March 26, 2005, the refuge officially opened for wildlife dependent recreation. As of November 13, 2005, there are 10 miles of trails open to the public for wildlife observation. The refuge is also open for hunting and will open for fishing in Spring 2006.

Area Economy

Assabet NWR is located in eastern Massachusetts near the Rhode Island border. Table 5-1 shows the area economy. The area population increased by 3.1 percent from 1995 to 2005, compared with a 4.8 percent increase for the state of Massachusetts and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 8.6 percent from 1995 to 2005, with the state of Massachusetts showing a 11.9 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 4.2 percent over the 1995-2005 period, while the state of Massachusetts and the U.S. increased by 20.0 and 13.2 percent respectively.

Table 5-1. Assabet NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Middlesex MA	1,465.0	3.1%	1,046.3	10.9%	$37,372	-12.3%
Suffolk MA	692.0	3.2%	673.0	5.3%	$45,845	23.0%
Area Total	**2,157.0**	**3.1%**	**1,719.2**	**8.6%**	**$41,609**	**4.2%**
Massachusetts	6,433.4	4.8 %	4,116.9	11.9 %	$43,501	20.0 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 5-2 shows the recreation visits for Assabet River NWR. The Refuge had 49,331 visits in 2006. Non-consumptive recreation visits totaled 47,603 with residents accounting for 40,258 or 82 percent of Refuge visits.

Table 5-2. Assabet River NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	17,010	4,253	21,263
Observation Platforms	0	0	0
Wildlife Observation	17,010	4,253	21,263
Beach /Water Use	0	0	0
Other Recreation	4,569	508	5,077
Hunting:			
Big Game	866	27	893
Small Game	281	6	287
Migratory Birds	179	9	188
Fishing:			
Freshwater	342	18	360
Saltwater	0	0	0
Total Visitation	***40,258***	***9,073***	***49,331***

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 this county. Visitor recreation expenditures for 2006 are shown in Table 5-3. Total expenditures were $365,000 with non-residents accounting for $189,700 or 52 percent of total expenditures. Expenditures on non-consumptive activities accounted for 97 percent of all expenditures, followed by hunting and fishing at 3 and less than 1 percent respectively.

Table 5-3. Assabet River NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:	$165.3	$188.4	$353.7
Hunting:			
Big Game	$6.5	$0.7	$7.1
Small Game	$0.7	$0.1	$0.9
Migratory Birds	$1.3	$0.3	$1.5
Total Hunting	$8.5	$1.0	$9.5
Fishing:			
Freshwater	$1.5	$0.2	$1.7
Saltwater	$0.0	$0.0	$0.0
Total Fishing	$1.5	$0.2	$1.7
Total Expenditures	***$175.3***	***$189.7***	***$365.0***

Table 5-4 summarizes the local economic effects associated with recreation visits. Final demand totaled $681,500 with associated employment of 4 jobs, $201,100 in employment income and $94,100 in total tax revenue.

Table 5-4. Assabet River NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$270.9	$287.8	$681.5
Jobs	2	2	4
Job Income	$89.2	$94.2	$201.1
Total Tax Revenue	$40.0	$42.3	$94.1

Table 5-5 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $5.03 means that for every $1 of budget expenditures, $5.03 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 5-5. Assabet River NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Assabet River NWR	$183.4	$365.0	$558.3	$5.03

Bombay Hook National Wildlife Refuge

Description

Bombay Hook NWR comprises 15,978 acres, approximately four-fifths of which is tidal salt marsh. The refuge has one of the largest expanses of nearly unaltered tidal salt marsh in the mid-Atlantic region. It also includes 1,100 acres of impounded fresh water pools, brushy and timbered swamps, 1,100 acres of agricultural lands, and timbered and grassy upland. The general terrain is flat and less than ten feet above sea level.

Bombay Hook was established in 1937 as a link in the chain of refuges that extends from Canada to the Gulf of Mexico. It is primarily a refuge and breeding ground for migrating birds and other wildlife. The value and importance of Bombay Hook for the protection and conservation of waterfowl has increased greatly over the years, primarily due to the loss of extensive surrounding marshland to urban and industrial development.

Bombay Hook is one of many refuges providing critical habitat between Canada and the Gulf of Mexico. Its 16,000 acres include freshwater pools, swamps, upland forests, agricultural fields, and one of the largest unaltered tidal salt marshes in the Mid-Atlantic region. Tidal salt marsh is the most valuable wildlife habitat in the State of Delaware. At 12,000 acres, Bombay Hook's salt marsh is one of the largest, untouched marshes on the east coast. With its intersecting tidal streams and rivers, it provides excellent natural habitat for the birds and mammals of the area. It also serves as a nursery and breeding area for marine organisms, many of which have sporting and commercial value.

Area Economy

Bombay Hook NWR is located in northeastern Delaware.. Table 5-6 shows the area economy. The area population increased by 11.8 percent from 1995 to 2005, compared with a 15.3 percent increase for the state of Delaware and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 16.2 percent from 1995 to 2005, with the state of Delaware showing a 18.7 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 14.8 percent over the 1995-2005 period, while the state of Delaware and the U.S. increased by 15.1 and 13.2 percent respectively.

Table 5-6. Bombay Hook NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Kent DE	143.5	18.8%	83.3	25.4%	$28,196	11.8%
New Castle DE	522.1	10.0%	350.9	14.2%	$41,937	16.9%
Area Total	**665.6**	**11.8%**	**434.2**	**16.2%**	**$35,067**	**14.8%**
Delaware	841.7	15.3 %	528.5	18.7 %	$37,088	15.1 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Nearly all visits to Bombay Hook NWR are related to non-consumptive activities, with a small number associated with big game hunting and migratory bird hunting. Bombay Hook NWR is well known as a premier birding location by birders throughout the country because of the number and variety of birds and the frequency of rare bird sightings. The refuge is a destination for many visitors from other states who plan trips specifically to visit Bombay Hook. Approximately 80 percent of refuge visitors are from outside the local area, particularly Pennsylvania, Maryland, the District of Columbia, and Virginia. Many plan a weekend on the Delmarva Peninsula for birding. Refuge visits totaled 270,860 in 2006. Non-residents accounted for 215,544 visits or 80 percent of all Refuge visits.

Table 5-7. Bombay Hook NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	26,000	104,000	130,000
Observation Platforms	1,820	7,280	9,100
Birding	25,400	101,600	127,000
Other Wildlife Observation	600	2,400	3,000
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	596	105	701
Small Game	0	0	0
Migratory Birds	900	159	1,059
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	***55,316***	***215,544***	***270,860***

Regional Economic Analysis

Visitor recreation expenditures are generated from non-consumptive and hunting activities. Table 5-8 shows that recreation expenditures for FY 2006 were nearly $13.5 million. The majority of expenditures are attributed to non-resident expenditures related to non-consumptive activities ($12.9 million).

Table 5-8. Bombay Hook NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$281.9	$7,135.8	$7,417.7
Other Non-Consumptive	$228.1	$5,774.7	$6,002.8
Total Non-Consumptive	$510.0	$12,910.5	$13,420.5
Hunting:			
Big Game	$19.4	$20.0	$39.4
Small Game	—	—	—
Migratory Birds	$23.2	$10.7	$34.0
Total Hunting	$42.6	$30.8	$73.4
Fishing:			
Freshwater	—	—	—
Saltwater	—	—	—
Total Fishing	—	—	—
Total Expenditures	***$552.6***	***$12,941.2***	***$13,493.8***

Table 5-9 summarizes the local economic effects associated with recreation visits. Final demand totaled $20.2 million with associated employment of 198 jobs, $6.5 in employment income and $3.0 in total tax revenue.

Table 5-9. Bombay Hook NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$810.9	$19,401.6	$20,212.5
Jobs	8	190	198
Job Income	$251.0	$6,205.9	$6,456.8
Total Tax Revenue	$119.3	$2,914.1	$3,033.4

Table 5-10 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $23.38 means that for every $1 of budget expenditures, $23.38 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 5-10. Bombay Hook NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Bombay Hook N**WR**	$803.9	$13,493.8	$5,299.3	$23.38

Chincoteague National Wildlife Refuge

Description

Chincoteague NWR is a 14,014-acre refuge on the Maryland-Virginia border. It encompasses the southern end of Assateague Island, a mid-Atlantic, coastal barrier island, and includes several other units on other islands in the vicinity. The refuge was established in 1943 to provide wintering and migration habitat for migratory birds. Its mission now includes preservation of endangered species, maintenance of indigenous species, and wildlife-oriented public use. The area is a popular tourist destination for birding, wildlife, sandy beaches, and wild horses. It is within a short drive of the Baltimore-Washington metro area and several beach resorts.

The refuge encompasses ocean beach, dune, maritime forest, tidal marsh, and freshwater moist soil habitats. Its diverse biota presents unique management challenges. Over 1 million visitors come to enjoy the beach and its wildlands aspects. The National Park Service operates the recreational beach section of the refuge. An auto route is closed to automobiles part of each day to permit use by bicyclists and pedestrians. Several nature trails are available. Off-road vehicles are tightly restricted but are permitted on parts of the beach in some seasons. Surf casting is a popular activity and freshwater fishing is permitted in a refuge impoundment. Limited hunts for sika (a small, oriental elk species introduced to the island) and waterfowl occur in the fall and winter.

Area Economy

Chincoteague NWR is located in eastern Virginia. Table 5-11 shows the area economy. The area population increased by 16.9 percent from 1995 to 2005, compared with a 13.4 percent increase for the state of Virginia and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 13.6 percent from 1995 to 2005, with the state of Virginia showing a 20.3 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 11.3 percent over the 1995-2005 period, while the state of Virginia and the U.S. increased by 18.1 and 13.2 percent respectively.

Table 5-11. Chincoteague NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Accomack VA	39.3	15.5%	18.3	7.9%	$22,356	4.5%
Worcester MD	48.6	18.1%	33.9	17.0%	$35,016	16.1%
Area Total	**87.9**	**16.9%**	**52.2**	**13.6%**	**$28,686**	**11.3%**
Virginia	7,564.3	13.4 %	4,728.9	20.3 %	$37,503	18.1 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 5-12 shows the recreation visits for Chincoteague NWR. The Refuge had 7,485,286 visits in 2006. Non-residents accounted for 89 percent of all Refuge visits. Almost all of the visits were for non-consumptive recreation with saltwater fishing accounting for 145,200 visits and hunting accounting for 2,592 visits.

Table 5-12. Chincoteague NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	115,176	931,876	1,047,052
Observation Platforms	76,784	621,250	698,034
Birding	115,176	931,876	1,047,052
Other Wildlife Observation	153,568	1,242,502	1,396,070
Beach /Water Use	307,135	2,485,005	2,792,140
Other Recreation	39,286	317,860	357,146
Hunting:			
Big Game	145	2,267	2,412
Small Game	0	0	0
Migratory Birds	31	149	180
Fishing:			
Freshwater	0	0	0
Saltwater	15,972	129,228	145,200
Total Visitation	***823,272***	***6,662,014***	***7,485,286***

Regional Economic Analysis

The economic area for the Refuge is Accomack County in Virginia and Worcester County in Maryland. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 5-13. Total expenditures were $238.7 million with non-residents accounting for $232.4 million or 97 percent of total expenditures. Expenditures on non-consumptive activities accounted for 98 percent of all expenditures, followed by fishing and hunting at 2 and less than 1 percent respectively.

Table 5-13. Chincoteague NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$508.3	$19,762.7	$20,271.0
Other Non-Consumptive	$5,341.5	$207,661.4	$213,002.9
Total Non-Consumptive	$5,849.8	$227,424.1	$233,273.9
Hunting:			
Big Game	$2.2	$110.7	$112.8
Small Game	—	—	—
Migratory Birds	$0.7	$12.0	$12.7
Total Hunting	$2.8	$122.7	$125.5
Fishing:			
Freshwater	—	—	—
Saltwater	$429.1	$4,864.0	$5,293.2
Total Fishing	$429.1	$4,864.0	$5,293.2
Total Expenditures	***$6,281.8***	***$232,410.8***	***$238,692.6***

Table 5-14 summarizes the local economic effects associated with recreation visits. Final demand totaled $315 million with associated employment of 3,766 jobs, $94.8 million in employment income and $50.3 million in total tax revenue.

Table 5-14. Chincoteague NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$8,924.8	$306,509.9	$315,434.6
Jobs	106	3,660	3,766
Job Income	$2,676.2	$92,180.6	$94,856.7
Total Tax Revenue	$1,350.3	$48,971.8	$50,322.1

Table 5-15 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $155.42 means that for every $1 of budget expenditures, $155.42 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 5-15. Chincoteague NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Chincoteague NWR	$2,439.3	$238,692.6	$140,422.6	$155.42

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, including American bald eagles and transitory peregrine falcons, and is a major staging site for tundra swans.

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 is an increasingly popular nature tourism destination on Maryland's upper Eastern Shore, attracting over 70,000 visitors annually to its waterfront vistas and peaceful walking trails.

Area Economy

Eastern Neck NWR is located in eastern Maryland. Table 5-16 shows the area economy. The area population increased by 18.5 percent from 1995 to 2005, compared with a 10.2 percent increase for the state of Maryland and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 35.4 percent from 1995 to 2005, with the state of Maryland showing a 19.4 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 25.4 percent over the 1995-2005 period, while the state of Maryland and the U.S. increased by 20.5 and 13.2 percent respectively.

Table 5-16. Eastern Neck NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Kent MD	19.9	6.3%	12.6	17.5%	$39,389	28.3%
Queen Annes MD	45.5	24.7%	21.1	49.0%	$40,282	22.7%
Area Total	**65.4**	**18.5%**	**33.7**	**35.4%**	**$39,836**	**25.4%**
Maryland	5,589.6	10.2 %	3,328.1	19.4 %	$41,972	20.5 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

In FY 2006, there were 103,946 visits on Eastern Neck NWR (Table 5-17). Non-consumptive activities were the most popular activities, with 94 percent of the visits. About 60 percent of the visits were by non-residents (61,180 visits). "Other wildlife observation" includes visitors who come to observe insects in the butterfly garden and other wildlife throughout the refuge. "Other recreation" includes bicycling and picnicking.

Table 5-17. Eastern Neck NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	14,800	22,200	37,000
Observation Platforms	4,000	6,000	10,000
Birding	16,000	24,000	40,000
Other Wildlife Observation	4,000	6,000	10,000
Beach /Water Use	0	0	0
Other Recreation	300	200	500
Hunting:			
Big Game	42	377	419
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	24	3	27
Saltwater	3,600	2,400	6,000
Total Visitation	***42,766***	***61,180***	***103,946***

Regional Economic Analysis

Table 5-18 shows that visitor recreation expenditures totaled $2.7 million, with non-consumptive related expenditures accounting for $2.5 million (92 percent). Hunting related expenditures totaled $19,000, and fishing related expenditures totaled $187,500. Non-residents accounted for 85 percent ($2.3 million) of all expenditures.

Table 5-18. Eastern Neck NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$176.54	$1,272.44	$1,448.99
Other Non-Consumptive	$126.45	$903.43	$1,029.88
Total Non-Consumptive	$302.99	$2,175.88	$2,478.87
Hunting:			
Big Game	$0.6	$18.4	$19.0
Small Game	$0.0	$0.0	$0.0
Migratory Birds	$0.0	$0.0	$0.0
Total Hunting	$0.6	$18.4	$19.0
Fishing:			
Freshwater	$0.3	$0.1	$0.4
Saltwater	$96.7	$90.3	$187.1
Total Fishing	$97.0	$90.4	$187.5
Total Expenditures	***$400.7***	***$2,284.7***	***$2,685.4***

Table 5-19 summarizes the total economic impacts associated with refuge visitor spending. Total final demand was $3.8 million. This is the total monetary value of economic activity generated in the local area by refuge visitor spending. In turn, this final demand generated 44 jobs (both full-time and part-time) with total job income of nearly $1.2 million. Total tax revenue generated (county, state and Federal) amounted to $597,300.

Table 5-19. Eastern Neck NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$589.2	$3,251.8	$3,841.0
Jobs	7	37	44
Job Income	$180.4	$996.9	$1,177.2
Total Tax Revenue	$91.2	$506.1	$597.3

Table 5-20 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $11.35 means that for every $1 of budget expenditures, $11.35 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. Eastern Neck NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Eastern Neck N**WR**	$422.8	$2,685.4	$2,115.4	$11.35

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 in southeastern Virginia. Table 5-21 shows the area economy. The area population decreased by 5.2 percent from 1995 to 2005, compared with a 13.4 percent increase for the state of Virginia and a 11.4 percent increase for the U.S. as a whole. Area employment decreased by 5.1 percent from 1995 to 2005, with the state of Virginia showing a 20.3 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 22.7 percent over the 1995-2005 period, while the state of Virginia and the U.S. increased by 18.1 and 13.2 percent respectively.

Table 5-21. Eastern Shore of Virginia NWR: Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Northampton VA	13.5	2.4%	6.9	17.9%	$25,502	21.2%
Norfolk VA	230.8	-5.7%	227.1	-5.7%	$30,528	23.9%
Area Total	**244.2**	**-5.2%**	**234.1**	**-5.1%**	**$28,015**	**22.7%**
Virginia	7,564.3	13.4 %	4,728.9	20.3 %	$37,503	18.1 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Visitors to the refuge enjoyed non-consumptive activities (28,862 visits) and big game hunting (285 visits) (Table 5-22). The majority of visitors come for birding. "Other recreation" includes bike riding. Refuge visitors were predominantly non-residents (27,661 visits).

Table 5-22. Eastern Shore of Virginia NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	0	0	0
Observation Platforms	0	0	0
Birding	1,294	24,590	25,884
Other Wildlife Observation	144	2,732	2,876
Beach /Water Use	0	0	0
Other Recreation	5	97	102
Hunting:			
Big Game	43	242	285
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	***1,486***	***27,661***	***29,147***

Regional Economic Analysis

Visitor recreation expenditures at Eastern Shore of Virginia NWR totaled $306,400 in FY 2006 (Table5-23). Non-consumptive activities generated $293,900 (96 percent of all expenditures). Non-resident visitors spent $302,600 while resident visitors spent $3,800.

Table 5-23. Eastern Shore of Virginia NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$2.86	$260.74	$263.60
Other Non-Consumptive	$0.33	$30.00	$30.33
Total Non-Consumptive	$3.18	$290.74	$293.93
Hunting:			
Big Game	$0.6	$11.8	$12.5
Small Game	–	–	–
Migratory Birds	–	–	–
Total Hunting	$0.6	$11.8	$12.5
Fishing:			
Freshwater	–	–	–
Saltwater	–	–	–
Total Fishing	–	–	–
Total Expenditures	***$3.8***	***$302.6***	***$306.4***

Table 5-24 summarizes the local economic effects associated with recreation visits. Final demand totaled $385,900 with associated employment of 5 jobs, $125,700 in employment income and $49,000 in total tax revenue.

Table 5-24. Eastern Shore of Virginia NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$5.0	$380.9	$385.9
Jobs	0	5	5
Job Income	$1.6	$124.1	$125.7
Total Tax Revenue	$0.6	$48.4	$49.0

Table 5-25 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $0.83 means that for every $1 of budget expenditures, $0.83 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 5-25. Eastern Shore of Virginia NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Eastern Shore of Virginia NWR	$583.9	$306.4	$178.0	$0.83

Edwin B. Forsythe National Wildlife Refuge

Description

Forsythe NWR, located 10 miles north of Atlantic City, is composed of two separate Divisions, Barnegat in the north and Brigantine in the south. The Brigantine and Barnegat Divisions were originally two distinct refuges, established in 1939 and 1967 respectively, to provide important wintering habitat for waterfowl, especially black ducks and Atlantic brant. The Divisions were combined in 1984 under the Edwin B. Forsythe name, in honor of the late conservationist Congressman from New Jersey.

Nearly 80 percent of Forsythe Refuge is tidal salt meadow and marsh, interspersed with shallow coves and bays. Most of the remainder of the refuge acreage is woodlands dominated by pitch pines, oaks, and white cedar, with some fields which are maintained to provide habitat diversity. More than 6,000 acres are designated as Wilderness Area. This includes Holgate and Little Beach, two of the few remaining undeveloped barrier beaches in New Jersey. These pristine sites provide critical nesting habitat for threatened piping plovers and a wide variety of other beach nesting species. Beaches and dunes provide nesting habitat for piping plovers, black skimmers and least terns. Occasionally peregrine falcons, bald eagles and osprey are seen.

Each spring and fall, thousands of water birds stop at Forsythe Refuge during their long migrations. Waterfowl, wading birds, and shore birds may be viewed from the Wildlife Drive as they feed and rest. Refuge uplands also provide important stopover habitat for migrating passerines.

Forsythe is a Western Hemisphere Shorebird Reserve Network site, a Wetlands of International Importance site under the Ramsar Convention, and an important birding area. It also is a part of The Jacques Cousteau National Estuarine Research Reserve and The New Jersey Coastal Heritage Trail. In 2002 the refuge was the recipient of the New Jersey Governor's Eco-Tourism Award.

Area Economy

Edwin B. Forsythe NWR is located in southeastern New Jersey. Table 5-26 shows the area economy. The area population increased by 13.8 percent from 1995 to 2005, compared with a 7.7 percent increase for the state of New Jersey and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 24.7 percent from 1995 to 2005, with the state of New Jersey showing a15.4 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 8.9 percent over the 1995-2005 period, while the state of New Jersey and the U.S. increased by 14.7 and 13.2 percent respectively.

Table 5-26. Edwin B. Forsythe NWR: Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Burlington NJ	449.1	9.0%	265.3	29.5%	$40,520	19.4%
Atlantic NJ	270.3	13.0%	184.4	15.0%	$34,307	-2.2%
Ocean NJ	558.2	18.4%	212.1	28.0%	$34,509	9.9%
Area Total	**1,277.6**	**13.8%**	**661.8**	**24.7%**	**$36,445**	**8.9%**
New Jersey	8,703.2	7.7 %	4,995.9	15.4 %	$43,831	14.7 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 5-27 shows the recreation visits to Edwin B. Forsythe NWR in FY 2006. Visitors to the refuge enjoyed a variety of non-consumptive activities (nature trails, wildlife observation, etc.), hunting, and fishing. "Other wildlife observation" includes photography, while "other recreation" includes picnicking and jogging. Recreation visits totaled 195,821. Visits were fairly evenly distributed between residents (52 percent) and non-residents (48 percent).

Table 5-27. Edwin B. Forsythe NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	12,000	13,000	25,000
Observation Platforms	12,000	13,000	25,000
Birding	33,120	35,880	69,000
Other Wildlife Observation	16,800	18,200	35,000
Beach /Water Use	2,400	2,600	5,000
Other Recreation	3,360	3,640	7,000
Hunting:			
Big Game	1,383	28	1,411
Small Game	210	0	210
Migratory Birds	880	220	1,100
Fishing:			
Freshwater	98	2	100
Saltwater	20,250	6,750	27,000
Total Visitation	***102,501***	***93,320***	***195,821***

Regional Economic Analysis

Visitor recreation expenditures for Edwin B. Forsythe NWR are shown in Table 5-28. Non-residents spent $1.8 million (65 percent), while residents spend about $991,000 (35 percent). Non-consumptive activities accounted for 63 percent of expenditures.

Table 5-28. Edwin B. Forsythe NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$146.2	$760.9	$907.1
Other Non-Consumptive	$139.8	$727.8	$867.7
Total Non-Consumptive	$286.0	$1,488.8	$1,774.8
Hunting:			
Big Game	$10.3	$0.7	$11.0
Small Game	$1.6	–	$1.6
Migratory Birds	$12.7	$11.8	$24.5
Total Hunting	$24.7	$12.5	$37.2
Fishing:			
Freshwater	$0.2	–	$0.2
Saltwater	$680.1	$317.6	$997.6
Total Fishing	$680.3	$317.6	$997.9
Total Expenditures	***$991.0***	***$1,818.9***	***$2,809.8***

Table 5-29 summarizes the economic effects associated with recreation visits. Total final demand associated with recreational visitor spending summed to $4.4 million. This is the total monetary value of economic activity generated in the area economy, which was generated by recreational visitors. In turn, this final demand generated 41 jobs, $1.4 million in job income, and $714,500 in total tax revenue. Non-resident visitors provided a $2.9 million stimulus to the local economy.

Table 5-29. Edwin B. Forsythe NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$1,579.8	$2,870.1	$4,449.9
Jobs	16	25	41
Job Income	$532.4	$915.9	$1,448.2
Total Tax Revenue	$260.2	$454.3	$714.5

Table 5-30 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $5.05 means that for every $1 of budget expenditures, $5.05 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. Edwin B. Forsythe NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Edwin B. Forsythe NWR	$1,043.0	$2,809.8	$2,454.5	$5.05

James River National Wildlife Refuge

Description

James River National Wildlife Refuge (NWR) is one of four refuges that comprise the Eastern Virginia Rivers National Wildlife Refuge Complex. The Refuge encompasses 4,200 acres of forest and wetland habitats along the James River, bordered by Powells Creek to the west, and the historic Flowerdew Hundred Plantation to the east. Located in Prince George County, Virginia, the refuge is 8 miles southeast of the City of Hopewell and thirty miles southeast of the City of Richmond.

The Refuge was created in 1991 to protect nesting and roosting habitat for the threatened American bald eagle. A secondary objective is to provide an opportunity to view wildlife in its natural environment, so that the public may better appreciate the refuge's role in conservation of wildlife resources.

Area Economy

James River NWR is located in southeastern Virginia. Table 5-31 shows the area economy. The area population increased by 10.2 percent from 1995 to 2005, compared with a 13.4 percent increase for the state of Virginia and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 7.9 percent from 1995 to 2005, with the state of Virginia showing a 20.3 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 13.2 percent over the 1995-2005 period, while the state of Virginia and the U.S. increased by18.1 and 13.2 percent respectively.

Table 5-31. James River NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Richmond (city) VA	193.2	-2.1%	182.6	-9.1%	$39,245	16.4%
Chesterfield VA	288.4	20.0%	156.9	38.7%	$37,911	14.5%
Prince George + Hopewell VA	59.0	11.8%	29.9	6.0%	$27,279	7.4%
Area Total	**540.6**	**10.2%**	369.4	7.9%	**$34,812**	**13.2%**
Virginia	7,564.3	13.4 %	4,728.9	20.3 %	$37,503	18.1 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

In FY 2006, there were 776 visits to James River NWR (Table 5-32). Non-consumptive activities were the most popular activities, with 68 percent of the visits.

Table 5-32. James River NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	210	52	262
Observation Platforms	0	0	0
Birding	16	4	20
Other Wildlife Observation	197	49	246
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	0	0	0
Small Game	198	50	248
Migratory Birds	0	0	0
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	***621***	***155***	***776***

Regional Economic Analysis

Table 5-33 depicts the visitor recreation expenditures at James River NWR in FY 2006. Total visitor expenditures were $17,600, with non-residents accounting for $10,600 of the expenditures. Non-consumptive visits and small game hunting accounted for $10,900 and $6,700, respectively.

Table 5-34 summarizes the local economic effects associated with recreation visits. Final demand totaled $26,200 with associated employment of 0.3 job, $7,200 in employment income and $3,700 in total tax revenue.

Table 5-33. James River NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$0.1	$0.1	$0.2
Other Non-Consumptive	$4.9	$5.8	$10.7
Total Non-Consumptive	$5.0	$5.9	$10.9
Hunting:			
Big Game	—	—	—
Small Game	$2.1	$4.7	$6.7
Migratory Birds	–	–	–
Total Hunting	$2.1	$4.7	$6.7
Fishing:	—	—	—
Freshwater	—	—	—
Saltwater	—	—	—
Total Fishing	—	—	—
Total Expenditures	***$7.0***	***$10.6***	***$17.6***

Table 5-34. James River NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$10.5	$15.8	$26.2
Jobs	0.1	0.2	0.3
Job Income	$3.1	$4.1	$7.2
Total Tax Revenue	$1.5	$2.2	$3.7

Table 5-35 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $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 5-35. James River NWR and Presquile NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
James River NWR and Presquile NWR	$179.5	$17.6	$28.4	$0.42

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. When acquisition is complete, it will consist of 1200 acres of varied habitats. Over the years, the refuge has become a resting and feeding area for more than 300 species of birds, 85 of which nest here. Fox, deer, muskrat, turtles, fish, frogs and a wide variety of wildflowers and plants are among the species that call the refuge "home". The Congressional mandate set forth for the refuge was to protect, preserve and enhance habitat; provide compatible outdoor recreation opportunities for the public; and to promote environmental education.

Area Economy

John Heinz NWR is located in southeastern Pennsylvania. Table 5-36 shows the area economy. The area population decreased by 4.7 percent from 1995 to 2005, compared with a 1.7 percent increase for the state of Pennsylvania and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 0.2 percent from 1995 to 2005, with the state of Pennsylvania showing a 10.2 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 14.8 percent over the 1995-2005 period, while the state of Pennsylvania and the U.S. increased by 13.8 and 13.2 percent respectively.

Table 5-36. John Heinz NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Delaware PA	554.4	0.2%	281.4	6.1%	$42,008	12.4%
Philadelphia PA	1,456.4	-6.4%	752.7	-1.8%	$31,129	18.3%
Area Total	**2,010.7**	**-4.7%**	**1,034.2**	**0.2%**	**$36,569**	**14.8%**
Pennsylvania	1,2405.3	1.7 %	7,132.3	10.2 %	$34,937	13.8 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

In FY 2006, there were 106,491 recreation visits at John Heinz NWR (Table 5-37). Refuge visitors enjoyed nature trails, observation platforms, wildlife observation, and freshwater fishing. Ninety-eight percent of visits were for non-consumptive activities. The majority of visits were by residents (76,645 visits).

Table 5-37. John Heinz NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	56,250	18,750	75,000
Observation Platforms	3,750	1,250	5,000
Birding	9,000	6,000	15,000
Other Wildlife Observation	5,395	3,596	8,991
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	2,250	250	2,500
Saltwater	0	0	0
Total Visitation	***76,645***	***29,846***	***106,491***

Regional Economic Analysis

Table 5-38 shows that visitor expenditures related to recreational activities on the refuge totaled nearly $1.1 million in FY 2006. Nearly all of these expenditures are attributable to non-consumptive activities. Non-residents spent $719,500 (67 percent of all expenditures).

Table 5-39 summarizes the economic effects associated with recreation visits at John Heinz NWR. Total final demand associated with recreational visitor spending summed to nearly $1.7 million. This is the total monetary value of economic activity generated in the area economy, which was generated by recreational visitors. In turn, this final demand generated 14 jobs, $536,300 in job income, and $241,400 in total tax revenue. Non-resident visitors provided a $1.1 million stimulus to the local economy.

Table 5-38. John Heinz NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$59.58	$190.87	$250.45
Other Non-Consumptive	$292.25	$525.30	$817.55
Total Non-Consumptive	$351.84	$716.16	$1,068.00
Hunting:			
Big Game	—	—	—
Small Game	—	—	—
Migratory Birds	—	—	—
Total Hunting	—	—	—
Fishing:			
Freshwater	$9.8	$3.3	$13.1
Saltwater	—	—	—
Total Fishing	$9.8	$3.3	$13.1
Total Expenditures	***$361.6***	***$719.5***	***$1,081.1***

Table 5-39. John Heinz NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$569.0	$1,125.1	$1,694.1
Jobs	5.0	9.4	14.4
Job Income	$180.2	$356.1	$536.3
Total Tax Revenue	$80.7	$160.7	$241.4

Table 5-40 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $2.00 means that for every $1 of budget expenditures, $2.00 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 5-40. John Heinz NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
John Heinz NWR	$1,201.6	$1,081.1	$1,318.4	$2.00

Mason Neck National Wildlife Refuge

Description

Mason Neck NWR was established in 1969 for the protection of nesting, feeding, and roosting habitat for the Bald eagles. It was the first federal refuge established specifically for the (then endangered) Bald eagle. The refuge is part of the Potomac River NWR Complex.

The refuge, situated along the Potomac River on the Mason Neck peninsula, consists of 2277 acres of oak-hickory forest, freshwater marshes, and has 4.4 miles of shoreline. The refuge has the largest fresh water marsh in Northern Virginia, the largest Great Blue heron rookery in the Mid-Atlantic region (over 1400 nests), is a designated RAMSAR site, and hosts over 200 species of birds, 31 species of mammals, and 44 species of reptiles and amphibians.

Eagles use the mature forests for shelter and nesting sites and the marshes, bays, and river for foraging and hunting. The refuge was listed as one of the top ten sites in the country for viewing Bald eagles.

Area Economy

Mason Neck NWR is located in northern Virginia. Table 5-36 shows the area economy. The county population increased by 13.1 percent from 1995 to 2005, compared with a 13.4percent increase for the state of Virginia and a 11.4 percent increase for the U.S. as a whole. County employment increased by 37.5 percent from 1995 to 2005, with the state of Virginia showing a 20.3 percent increase and the U.S. a 17.0 percent increase. County per capita income increased by 22.8 percent over the 1995-2005 period, while the state of Virginia and the U.S. increased by 18.1 and 13.2 percent respectively.

Table 5-41. Mason Neck NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Fairfax VA	1,042.6	13.1%	822.4	37.5%	$60,289	22.8%
Virginia	7,564.3	13.4%	4,729.0	20.3%	$37,503	18.1%
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Refuge visits totaled 50,296 in 2006. Almost all of the visits were for non-consumptive recreation with residents accounting for 64 percent of all Refuge visits.

Table 5-42. Mason Neck NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	17,500	7,500	25,000
Observation Platforms	0	0	0
Birding	2,250	5,250	7,500
Other Wildlife Observation	12,250	5,250	17,500
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	266	30	296
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	***32,266***	***18,030***	***50,296***

Regional Economic Analysis

The economic area for the Refuge is Fairfax County Virginia. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 5-43. Total expenditures were $589,000 with residents accounting for $438,800 or 75 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 $775,100 with associated employment of 7 jobs, $279,100 in employment income and $124,400 in total tax revenue.

Table 5-43. Mason Neck NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$14.9	$167.0	$181.9
Other Non-Consumptive	$131.3	$270.4	$401.7
Total Non-Consumptive	$146.2	$437.4	$583.6
Hunting:			
Big Game	$4.0	$1.4	$5.4
Small Game	—	—	—
Migratory Birds	—	—	—
Total Hunting	$4.0	$1.4	$5.4
Fishing:			
Freshwater	—	—	—
Saltwater	—	—	—
Total Fishing	—	—	—
Total Expenditures	***$150.2***	***$438.8***	***$589.0***

Table 5-44. Mason Neck NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$203.2	$571.8	$775.1
Jobs	2	5	7
Job Income	$74.7	$204.4	$279.1
Total Tax Revenue	$32.7	$91.7	$124.4

Table 5-45 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. Mason Neck NWR's budget included expenditures for utilities, supplies, equipment rental, office rent, equipment purchase (tractor, workman), events, signage, travel, training, fuel, and equipment repair. 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 $1.50 means that for every $1 of budget expenditures, $1.50 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 5-45. Mason Neck NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Mason Neck NWR	$809.0	$589.0	$624.4	$1.50

Monomoy National Wildlife Refuge

Description

Monomoy National Wildlife Refuge (NWR) was established in 1944 to provide habitat for migratory birds. Sand stretches for eight miles off the elbow of Cape Cod, forming the barrier islands of North and South Monomoy. In addition to the two islands, a 40-acre unit on Morris Island is also part of the refuge. This is where the headquarters and visitor center are located. The total size of the refuge is 7,604 acres with varied habitats of oceans, salt and freshwater marshes, dunes, and freshwater ponds. The refuge provides important resting, nesting and feeding habitat for migratory birds, including the Federally protected piping plover and roseate tern. More than ten species of seabirds, shorebirds, and waterbirds nest on the islands. The refuge also supports the second largest nesting colony of common terns on the Atlantic seaboard with over 8,000 nesting pairs.

Approximately ninety-four percent of the refuge is designated as a Wilderness Area. The visitor to this wilderness refuge encounters a very special place -- a sanctuary that supports an amazing diversity of wildlife and plant species. Monomoy has been listed as a Western Hemisphere Shorebird Reserve Network Regional site and an Important Bird Area due to its importance to migratory shorebirds. Monomoy's beaches provide important spawning habitat for horseshoe crabs. During the fall and winter, thousands of seaducks congregate in offshore areas around the refuge. The refuge is the largest haul-out site of gray seals on the Atlantic Seaboard with approximately 5,000 seals. Largely protected from human intrusion, Monomoy offers some of the most desirable habitat for seals in the region and harbor and gray seals now thrive on Monomoy. A restored Coast Guard lighthouse is located on South Monomoy and is listed on the National Register of Historic Places.

Area Economy

Monomoy NWR is located in eastern Massachusetts. Table 5-46 shows the area economy. The county population increased by 11.5 percent from 1995 to 2005, compared with a 4.8 percent increase for the state of Massachusetts and a 11.4 percent increase for the U.S. as a whole. County employment increased by 30.0 percent from 1995 to 2005, with the state of Massachusetts showing a11.9 percent increase and the U.S. a 17.0 percent increase. County per capita income increased by 20.8 percent over the 1995-2005 period, while the state of Massachusetts and the U.S. increased by 20.0 and 13.2 percent respectively.

Table 5-46. Monomoy NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Barnstable MA	226.2	11.5%	143.7	30.0%	$43,992	20.8%
Massachusetts	6,433.4	4.8%	4,116.9	11.9%	$43,501	20.0%
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 5-47 shows the recreation visits for Monomoy NWR. The Refuge had 31,660 visits in 2006. Almost all of the visits were for non-consumptive recreation with non-residents accounting for 28,433 visits or 90 percent of Refuge visits. Water recreation includes swimming, kayaking, and boating, while other recreation includes visits to the visitor center and photography.

Table 5-47. Monomoy NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	172	1,544	1,716
Observation Platforms	0	0	0
Wildlife Observation	318	2,866	3,184
Beach /Water Use	850	7,650	8,500
Other Recreation	1,700	15,300	17,000
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	0	0	0
Fishing:			
Freshwater	3	27	30
Saltwater	185	1,046	1,230
Total Visitation	***3,228***	***28,433***	***31,660***

Regional Economic Analysis

The economic area for the Refuge is Barnstable County in Massachusetts. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 5-48. Total expenditures were $489,900 with non-residents accounting for $475,100or 97 percent of total expenditures. Expenditures on non-consumptive activities accounted for 91 percent of all expenditures, with fishing at accounting for 44,300 or 9 percent of Refuge visits.

Table 5-48. Monomoy NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Total Non-Consumptive	$9.8	$435.4	$445.2
Hunting:			
Big Game	—	—	—
Small Game	—	—	—
Migratory Birds	—	—	—
Total Hunting	—	—	—
Fishing:			
Freshwater	—	$0.4	$0.4
Saltwater	$5.0	$39.4	$44.3
Total Fishing	$5.0	$39.7	$44.7
Total Expenditures	***$14.8***	***$475.1***	***$489.9***

Table 5-49 summarizes the local economic effects associated with recreation visits. Final demand totaled $635,700 with associated employment of 6 jobs, $213,700 in employment income and $106,300 in total tax revenue.

Table 5-49. Monomoy NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$19.5	$616.2	$635.7
Jobs	0	6	6
Job Income	$6.7	$207.0	$213.7
Total Tax Revenue	$3.3	$102.9	$106.3

Table 5-50 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $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 5-50. Monomoy NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Monomoy NWR	$395.8	$489.9	$279.8	$1.94

Ninigret National Wildlife Refuge

Description

Named after one of the original chiefs of the Narragansett Indians, the Ninigret National Wildlife Refuge is located on the Southern Coast of Rhode Island in the Town of Charlestown, Washington County. Perched on the shoreline of the largest saltpond in the State, the Ninigret National Wildlife Refuge sits upon the glacial outwash plain of the Charlestown moraine, providing the refuge with its unique character.

The wildlife present is as diverse as the vegetation which occupies the land. Over 250 bird species visit seasonally, and 70 species nest on the property, making bird watching and photography popular refuge activities. From saltmarshes, kettle ponds, freshwater wetlands, maritime shrublands and forests dominated by oak or maple, habitat is varied and plentiful.

Originally being used as a Naval Auxiliary landing field during world war II, the main portion of the refuge still contains remnants of the numerous runways, taxi-ways, and buildings which supported the war effort. Many people served their country here, with this rich history celebrated in an interpretive "trails through time" route which passes through the refuge.

Ninigret, along with the four other National Wildlife Refuges in the State are administered by the Rhode Island National Wildlife Refuge Complex, headquartered in Charlestown, Rhode Island.

On the refuge, the new Kettle Pond Visitor Center and headquarters, which opened in October 2005, celebrates the Ninigret Refuge and all of the other refuges in Rhode Island. This facility contains interactive exhibits, displays, a sales area, classrooms for special events, and knowledgeable people where visitors can come and explore the refuges and learn about the wildlife resources and coastal environments of each refuge.

Area Economy

Ninigret NWR is located on southern coast of Rhode Island. Table 5-51 shows the area economy. The area population increased by 6.7 percent from 1995 to 2005, compared with a 5.6 percent increase for the state of Rhode Island and a 11.4 percent increase for the U.S. as a whole. County employment increased by 22.7 percent from 1995 to 2005, with the state of Rhode Island showing a 12.6 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 19.8 percent over the 1995-2005 period, while the state of Rhode Island and the U.S. increased by 15.2 and 13.2 percent respectively.

Table 5-51. Ninigret NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Washington RI	128.1	10.3%	73.0	25.3%	$40,291	20.7%
Kent RI	171.1	4.3%	104.0	20.9%	$37,901	18.9%
Area Total	**299.2**	**6.7%**	**177.0**	**22.7%**	**$39,096**	**19.8%**
Rhode Island	1073.6	5.6 %	609.1	12.6 %	$35,324	15.2 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 5-52 shows the recreation visits for Ninigret NWR. The Refuge had 108,959 visits in 2006. Non-consumptive recreation accounted for 104,056 visits. Residents accounted for 72 percent of all Refuge visits.

Table 5-52. Ninigret NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	41,647	17,849	59,495
Observation Platforms	10,471	2,618	13,089
Birding	20,990	8,996	29,985
Other Wildlife Observation	0	0	0
Beach /Water Use	1,115	372	1,487
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	3,922	981	4,903
Total Visitation	78,145	30,814	108,959

Regional Economic Analysis

The economic area for the Refuge is Washington and Kent Counties in Rhode Island. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 5-53. Total expenditures were $1.1 million with non-residents accounting for $664,300 or 62 percent of total expenditures. Expenditures on non-consumptive activities accounted for 90 percent of all expenditures, fishing accounted for 10 percent.

Table 5-54 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.3 million with associated employment of 15 jobs, $425,600 in employment income and $214,800 in total tax revenue.

Table 5-53. Ninigret NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$92.6	$190.8	$283.4
Other Non-Consumptive	$237.4	$445.9	$683.3
Total Non-Consumptive	$330.0	$636.6	$966.7
Hunting:			
Big Game	–	–	–
Small Game	–	–	–
Migratory Birds	–	–	–
Total Hunting	–	–	–
Fishing:			
Freshwater	–	–	–
Saltwater	$79.0	$27.7	$106.7
Total Fishing	$79.0	$27.7	$106.7
Total Expenditures	***$409.1***	***$664.3***	***$1,073.4***

Table 5-54. Ninigret NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$499.9	$796.3	$1,296.2
Jobs	6	9	15
Job Income	$166.4	$259.2	$425.6
Total Tax Revenue	$83.7	$131.1	$214.8

Table 5-55 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $6.25 means that for every $1 of budget expenditures, $6.25 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. Ninigret NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Ninigret NWR	$376.8	$1,073.4	$1,281.2	$6.25

Parker River National Wildlife Refuge

Description

Parker River National Wildlife Refuge was established in 1942 primarily to provide feeding, resting, and nesting habitat for migratory birds. Located along the Atlantic Flyway, the refuge is of vital stopover significance to waterfowl, shorebirds, and songbirds during pre- and post-breeding migratory periods. The refuge occupies in part, the southern three-fourths of Plum Island, an 8 mile long barrier island near Newburyport, Massachusetts.

The refuge consists of 4,662 acres of diverse upland and wetland habitats including sandy beach and dune, shrub/thicket, bog, swamp, freshwater marsh, saltwater marsh and associated creek, river, mud flat, and salt panne. These and other refuge habitats support varied and abundant populations of resident and migratory wildlife including more than 300 species of birds and additional species of mammals, reptiles, amphibians, insects, and plants.

Area Economy

Parker River NWR is located in eastern Massachusetts. Table 5-56 shows the area economy. The county population increased by 6.5 percent from 1995 to 2005, compared with a 4.8 percent increase for the state of Massachusetts and a 11.4 percent increase for the U.S. as a whole. County employment increased by 12.5 percent from 1995 to 2005, with the state of Massachusetts showing a 11.9 percent increase and the U.S. a 17.0 percent increase. County per capita income increased by 18.5 percent over the 1995-2005 period, while the state of Massachusetts and the U.S. increased by 20.0 and 13.2 percent respectively.

Table 5-56. Parker River NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Essex MA	734.3	6.5%	397.3	12.5%	$42,563	18.5%
Massachusetts	6,433.4	4.8 %	4,116.9	11.9 %	$43,501	20.0 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

In FY 2006, there were 457,966 visits to Parker River NWR (Table 5-57). Visitors to Parker River NWR enjoy a variety of recreational activities including non-consumptive activities, hunting, and saltwater fishing. Ninety-nine percent of visits are attributed to non-consumptive activities. "Other wildlife observation" includes visitors watching butterflies, other invertebrates, deer, seals, and other mammals. "Other recreation" includes visitors enjoying biking, shellfishing, berry picking, jogging, and cross country skiing.

Table 5-57. Parker River NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	115,938	49,688	165,625
Observation Platforms	14,000	6,000	20,000
Birding	72,000	48,000	120,000
Other Wildlife Observation	7,000	3,000	10,000
Beach /Water Use	70,000	30,000	100,000
Other Recreation	25,988	11,138	37,125
Hunting:			
Big Game	28	7	35
Small Game	0	0	0
Migratory Birds	1,301	145	1,446
Fishing:			
Freshwater	0	0	0
Saltwater	2,988	747	3,735
Total Visitation	***309,242***	***148,724***	***457,966***

Regional Economic Analysis

Table 5-58 shows visitor recreation expenditures in the refuge region during FY 2006. These expenditures totaled nearly $7.4 million, with the majority being attributed to non-consumptive activities. Non-resident visitors to the refuge spent $5.1 million in the local area in FY 2006.

Table 5-59 summarizes the local economic effects associated with recreation visits. Final demand totaled $11.4 million with associated employment of 107 jobs, $3.8 million in employment income and $1.8 million in total tax revenue.

Table 5-58. Parker River NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$476.67	$1,526.93	$2,003.60
Other Non-Consumptive	$1,700.97	$3,502.80	$5,203.77
Total Non-Consumptive	$2,177.64	$5,029.73	$7,207.37
Hunting:			
Big Game	$0.4	$0.3	$0.7
Small Game	–	–	–
Migratory Birds	$23.5	$9.7	$33.2
Total Hunting	$23.8	$10.0	$33.9
Fishing:			
Freshwater	–	–	–
Saltwater	$100.3	$35.1	$135.5
Total Fishing	$100.3	$35.1	$135.5
Total Expenditures	***$2,301.8***	***$5,074.9***	***$7,376.7***

Table 5-59. Parker River NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$3,574.3	$7,817.1	$11,391.4
Jobs	34	73	107
Job Income	$1,207.2	$2,576.6	$3,783.8
Total Tax Revenue	$574.8	$1,244.4	$1,819.2

Table 5-60 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $9.38 means that for every $1 of budget expenditures, $9.38 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 5-60. Parker River NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Parker River NWR	$1,687.8	$7,376.7	$8,448.8	$9.38

Patuxent Research National Wildlife Refuge

Description

Established in 1936 by executive order of President Franklin D. Roosevelt, the Patuxent Research Refuge is the Nation's only National Wildlife Refuge established to support wildlife research. With land surrounding the Patuxent and Little Patuxent Rivers between Washington, D.C. and Baltimore, MD, the Refuge has grown from the original 2,670 acres to its present size of 12,750 acres and encompasses land formerly managed by the Departments of Agriculture and Defense. Throughout decades of change, Patuxent's mission of conserving and protecting the nation's wildlife and habitat through research and wildlife management techniques has remained virtually unchanged.

Patuxent Research Refuge supports a wide diversity of wildlife in forest, meadow, and wetland habitats. The land is managed to maintain biological diversity and to protect and benefit native and migratory bird species. During the fall and spring migrations, many waterfowl species stop to rest and feed. Over 270 species of birds occur on the Refuge. A nesting pair of bald eagles has used the North Tract of the Refuge since 1989.

Area Economy

Patuxent Research NWR is located in central Maryland. Table 5-61 shows the area economy. The area population increased by 9.6 percent from 1995 to 2005, compared with a 10.2 percent increase for the state of Maryland and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 22.2 percent from 1995 to 2005, with the state of Maryland showing a 19.4 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 19.6 percent over the 1995-2005 period, while the state of Maryland and the U.S. increased by 20.5 and 13.2 percent respectively.

Table 5-61. Patuxent Research NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Anne Arundel MD	509.4	10.0%	345.0	31.3%	$45,648	27.4%
Prince George's MD	842.8	9.3%	423.5	15.6%	$34,912	10.8%
Area Total	**1,352.2**	**9.6%**	**768.5**	**22.2%**	**$40,280**	**19.6%**
Maryland	5,589.6	10.2 %	3,328.1	19.4 %	$41,972	20.5 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 5-62 shows the recreation visits for Patuxent Research NWR. The Refuge had 131,402 visits in 2006. Non-consumptive recreation accounted for 123,340 visits or 94 percent of total Refuge visitation. Residents comprised 81 percent of all Refuge visits.

Table 5-62. Patuxent Research NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	26,041	4,596	30,637
Observation Platforms	466	82	548
Birding	22,058	5,515	27,573
Other Wildlife Observation	2,451	613	3,064
Beach /Water Use	0	0	0
Other Recreation	49,214	12,304	61,518
Hunting:			
Big Game	3,589	1,196	4,785
Small Game	78	19	97
Migratory Birds	426	106	532
Fishing:			
Freshwater	2,383	265	2,648
Saltwater	0	0	0
Total Visitation	***106,706***	***24,696***	***131,402***

Regional Economic Analysis

The economic area for the Refuge is Anne Arundel and Prince George's Counties. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 5-63. Total expenditures were $1.4 million with non-residents accounting for $741,800 or 53 percent of total expenditures. Expenditures on non-consumptive activities accounted for 91 percent of all expenditures, followed by hunting and fishing at 8 and 1 percent respectively.

Table 5-63. Patuxent Research NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$146.0	$175.4	$321.5
Other Non-Consumptive	$453.6	$503.6	$957.2
Total Non-Consumptive	$599.7	$679.0	$1,278.7
Hunting:			
Big Game	$47.0	$51.1	$98.1
Small Game	$0.3	$0.7	$1.0
Migratory Birds	$6.1	$5.7	$11.9
Total Hunting	$53.4	$57.5	$110.9
Fishing:			
Freshwater	$15.5	$5.3	$20.8
Saltwater	–	–	–
Total Fishing	$15.5	$5.3	$20.8
Total Expenditures	***$668.6***	***$741.8***	***$1,410.4***

Table 5-64 summarizes the local economic effects associated with recreation visits. Final demand totaled $2.1 million with associated employment of 20 jobs, $646,300 in employment income and $319,800 in total tax revenue.

Table 5-64. Patuxent Research NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$994.8	$1,090.7	$2,085.6
Jobs	10	10	20
Job Income	$308.3	$338.0	$646.3
Total Tax Revenue	$152.3	$167.5	$319.8

Table 5-65 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $1.36 means that for every $1 of budget expenditures, $1.36 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 5-65. Patuxent Research NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Patuxent Research NWR	$2,634.0	$1,410.4	$2,179.4	$1.36

Presquile National Wildlife Refuge

Description

Presquile National Wildlife Refuge is one of four refuges that comprise the Eastern Virginia Rivers National Wildlife Refuge Complex. The Refuge is a 1329-acre island in the James River, located approximately 20 miles south of Richmond, Virginia. Established to protect habitat for wintering waterfowl and other migratory birds, Presquile is an important component in the network of refuges on and around the Chesapeake Bay, our Nation's largest estuary. Presquile historically provided important habitat for wintering Canada geese that breed along James Bay in eastern Canada. The Refuge is also home to nesting and roosting bald eagles. The Refuge is primarily hardwood swamp, with a fringe of marsh and 300 acres of upland fields.

Area Economy

Presquile NWR is located in southeastern Virginia. Table 5-66 shows the area economy. The area population increased by 10.2 percent from 1995 to 2005, compared with a 13.4 percent increase for the state of Virginia and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 7.9 percent from 1995 to 2005, with the state of Virginia showing a 20.3 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 13.2 percent over the 1995-2005 period, while the state of Virginia and the U.S. increased by 18.1 and 13.2 percent respectively.

Table 5-66. Presquile NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Chesterfield VA	288.4	20.0%	156.9	38.7%	$37,911	14.5%
Prince George + Hopewell	59.0	11.8%	29.9	6.0%	$27,279	7.4%
Richmond City	193.2	-2.1%	182.6	-9.1%	$39,245	16.4%
Area Total	**540.6**	**10.2%**	**369.4**	**7.9%**	**$34,812**	**13.2%**
Virginia	7,564.3	13.4 %	4,728.9	20.3 %	$37,503	18.1 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 5-67 shows the recreation visits for Presquile NWR in FY 2006. Non-consumptive activities were the most popular activities with 996 visits. Approximately three-fourths of all visits were by visitors living in the local area. The popularity of Presquile NWR has been increasing rapidly. Since 2003, visitation numbers have been growing at an average rate of about 20 percent per year.

Table 5-67. Presquile NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	238	60	298
Observation Platforms	150	50	200
Birding	150	50	200
Other Wildlife Observation	224	75	298
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	0	0	0
Small Game	66	17	83
Migratory Birds	0	0	0
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	***828***	***251***	***1,079***

Regional Economic Analysis

The economic area for the Refuge is Chesterfield County, Prince George County, City of Hopewell and the city of Richmond in Virginia. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 5-68. Total expenditures were $12,300 with non-residents accounting for $7,600 or 62 percent of total expenditures. Expenditures on non-consumptive activities accounted for 82 percent of all expenditures, followed by hunting with 18 percent of recreation expenditures.

Table 5-68. Presquile NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$0.7	$1.1	$1.7
Other Non-Consumptive	$3.4	$5.0	$8.3
Total Non-Consumptive	$4.0	$6.0	$10.0
Hunting:			
Big Game	–	–	–
Small Game	$0.7	$1.6	$2.2
Migratory Birds	–	–	–
Total Hunting	$0.7	$1.6	$2.2
Fishing:			
Freshwater	–	–	–
Saltwater	–	–	–
Total Fishing	–	–	–
Total Expenditures	***$4.7***	***$7.6***	***$12.3***

Table 5-69 summarizes the local economic effects associated with recreation visits. Final demand totaled $17,800 with associated employment of 0.2 jobs, $5,500 in employment income and $2,700 in total tax revenue.

Table 5-69. Presquile NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$6.9	$10.9	$17.8
Jobs	0.1	0.1	0.2
Job Income	$2.1	$3.4	$5.5
Total Tax Revenue	$1.0	$1.6	$2.7

Table 5-70 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $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 5-70. James River NWR and Presquile NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
James River NWR and Presquile NWR	$179.5	$17.6	$28.4	$0.42

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 124 pairs of nesting Federally Endangered Roseate Terns and over 3000 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 B. McKinney NWR is located in southern Connecticut. Table 5-71 shows the area economy. The area population increased by 19.7 percent from 1995 to 2005, compared with a 5.3 percent increase for the state of Connecticut and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 12.6 percent from 1995 to 2005, with the state of Connecticut showing a 11.0 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 16.1 percent over the 1995-2005 period, while the state of Connecticut and the U.S. increased by 15.6 and 13.2 percent respectively.

Table 5-71. Stewart B. McKinney NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Middlesex CT	162.8	9.9%	95.8	17.8%	$42,705	13.9%
New Haven CT	4,442.1	23.3%	485.7	11.4%	$39,292	10.0%
Fairfield CT	901.1	6.3%	589.5	12.8%	$67,269	21.5%
Area Total	**5,506.0**	**19.7%**	**1,171.0**	**12.6%**	**$49,755**	**16.1%**
Connecticut	3,500.7	5.3 %	2174.2	11.0 %	$47,388	15.6 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 5-72 shows the recreation visits for Stewart B. McKinney NWR. The Refuge had 21,710 visits in 2006. Non-consumptive recreation accounted for 21,000 visits with residents comprising 83 percent of all visits. In summer months, visitors use beach/water to access several of the islands via personal boat, such as Outer Island and Calf Island units as well as Norwalk Islands Units. The Milford Point Unit contains beach that people walk on, bird watch, or use for occasional swimming.

Table 5-72. Stewart B. McKinney NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	7,650	1,350	9,000
Observation Platforms	0	0	0
Wildlife Observation	8,400	2,100	10,500
Beach /Water Use	1,200	300	1,500
Other Recreation	0	0	0
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	54	6	60
Fishing:			
Freshwater	0	0	0
Saltwater	618	33	650
Total Visitation	***17,922***	***3,789***	***21,710***

Regional Economic Analysis

The economic area for the Refuge is Middlesex, New Haven and Fairfield Counties in Connecticut. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 5-73 . Total expenditures were $185,100 with residents accounting for $100,500 or 54 percent of total expenditures. Expenditures on non-consumptive activities accounted for 87 percent of all expenditures, followed by fishing and hunting at 12 and less than 1 percent respectively.

Table 5-73. Stewart B. McKinney NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:	$78.8	$82.7	$161.5
Hunting:			
Big Game	—	—	—
Small Game	—	—	—
Migratory Birds	$1.0	$0.4	$1.4
Total Hunting	$1.0	$0.4	$1.4
Fishing:			
Freshwater	—	—	—
Saltwater	$20.7	$1.5	$22.3
Total Fishing	$20.7	$1.5	$22.3
Total Expenditures	**$100.5**	**$84.6**	**$185.1**

Table 5-74 summarizes the local economic effects associated with recreation visits. Final demand totaled $294,700 with associated employment of 2 jobs, $97,500 in employment income and $48,500 in total tax revenue.

Table 5-74. Stewart B. McKinney NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$160.5	$134.2	$294.7
Jobs	1	1	2
Job Income	$53.5	$43.6	$97.1
Total Tax Revenue	$26.5	$21.9	$48.5

Table 5-75 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $1.07 means that for every $1 of budget expenditures, $1.07 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 5-75. Stewart B. McKinney NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Stewart B. McKinney NWR	$423.8	$185.1	$269.0	$1.07

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:

Bear River MBR (Utah)
Benton Lake NWR (Montana)
Browns Park NWR (Colorado)
Charles M. Russell NWR (Montana)
Huron WMD (South Dakota)
Madison WMD (South Dakota)
Monte Vista NWR (Colorado)
Quivira NWR (Kansas)
Rainwater Basin WMD (Nebraska)

Bear River Migratory Bird Refuge

Description

Historically, the marshes of Bear River Migratory Bird Refuge (MBR) have been an oasis for water birds. This oasis is surrounded by arid desert lands. As a key part of the Great Salt Lake ecosystem, the Refuge provides habitat for more than 200 bird species, making it a popular birding hotspot in northern Utah. In spring, summer, and fall, visitors can view American avocets, black-necked stilts, white-faced ibis, and a host of other species.

The Refuge serves a vital role in the Bear River delta ecosystem by protecting, creating, and managing more than 41,000 acres of freshwater wetlands. Fresh water from the Bear River is captured in a series of 25 impoundments.

Water levels are manipulated in these wetlands to ensure that adequate amounts of water and subsequent aquatic habitat are available throughout critical life stages of breeding birds like the American avocet, black-necked stilt, snowy plover, as well as migrating birds such as the northern pintail, Wilson's phalarope, and tundra swan. The importance of the Refuge as a staging area for migratory waterfowl is evidenced by the tremendous numbers of ducks (500,000) and Canada geese (5,000) found on the Refuge each fall. In addition, roughly 75 percent of the western population of tundra swans (more than 30,000 birds) use the Refuge for fall staging and wintering in mild years.

Area Economy

Bear River MBR is located in northcentral Utah in Box Elder County. Table 6-1 shows the county economy. The county population increased by 18.6 percent from 1995 to 2005, compared with a 23.6 percent increase for the state of Utah and a 11.4 percent increase for the U.S. as a whole. County employment increased by 15.8 percent from 1995 to 2005, with the state of Utah showing a 30.5 percent increase and the U.S. a 17.0 percent increase. County per capita income increased by 0.6 percent over the 1995-2005 period, while the state of Utah and the U.S. increased by 12.0 and 13.2 percent respectively.

Table 6-1. Bear River MBR
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Box Elder UT	46.3	18.6%	26.1	15.8%	$23,289	0.6%
Utah	2,490.3	23.6 %	1,510.9	30.5 %	$27,321	12.0 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 6-2 shows the recreation visits for Bear River MBR. The Refuge had 42,209 visits in 2006. Non-consumptive recreation accounted for 32,500 visits, hunting accounted for 9,097 visits and fishing for 612 visits. Non-residents accounted for 25,660 visits, or 61 percent of Refuge visits.

Table 6-2. Bear River MBR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	0	0	0
Observation Platforms	0	0	0
Birding	11,200	20,800	32,000
Other Wildlife Observation	0	0	0
Beach /Water Use	0	0	0
Other Recreation	175	325	500
Hunting:			
Big Game	0	0	0
Small Game	315	105	420
Migratory Birds	4,339	4,339	8,677
Fishing:			
Freshwater	520	92	612
Saltwater	0	0	0
Total Visitation	***16,549***	***25,660***	***42,209***

Regional Economic Analysis

The economic area for the Refuge is Box Elder County in Utah. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 6-3. Total expenditures were $1.6 million with non-residents accounting for $1.4 million or 87 percent of total expenditures. Expenditures on non-consumptive activities accounted for 73 percent of all expenditures, followed by hunting and fishing at 25 and 2 percent respectively.

Table 6-3. Bear River MBR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$93.2	$1,095.7	$1,188.9
Other Non-Consumptive	$1.5	$17.1	$18.6
Total Non Consumptive	$94.7	$1,112.8	$1,207.5
Hunting:			
Big Game	—	—	—
Small Game	$3.8	$8.2	$12.0
Migratory Birds	$111.9	$293.4	$405.3
Total Hunting	$115.7	$301.6	$417.3
Fishing:			
Freshwater	$11.4	$7.7	$19.1
Saltwater	—	—	—
Total Fishing	$11.4	$7.7	$19.1
Total Expenditures	***$221.8***	***$1,422.1***	***$1,643.9***

Table 6-4 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.9 million with associated employment of 31 jobs, $624,900 in employment income and $299,700 in total tax revenue.

Table 6-4. Bear River MBR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$270.8	$1,691.5	$1,962.4
Jobs	4	27	31
Job Income	$81.0	$543.9	$624.9
Total Tax Revenue	$40.0	$259.7	$299.7

Table 6-5 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $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 6-5. Bear River MBR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Bear River MBR	$1,153.0	$1,643.9	$1,022.4	$2.31

Benton Lake National Wildlife Refuge

Description

Covering 12,383 acres (19 square miles), Benton Lake National Wildlife Refuge (NWR) is located on the western edge of the northern Great Plains, 50 miles east of the Rocky Mountains and 12 miles north of Great Falls, Montana. Despite its name, Benton Lake is actually a 5,000 acre shallow wetland created by glaciers thousands of years ago.

The gently rolling terrain of the Refuge is dominated by native shortgrass prairie and surrounded on three sides by mountain ranges. The main marsh on the Refuge has been subdivided into eight impoundments by a series of dikes and water control structures; this allows efficient water management and provides a diversity of habitat types.

Area Economy

Benton Lake NWR is located in central Montana. Table 6-6 shows the area economy. The area population decreased by 3.5 percent from 1995 to 2005, compared with a 6.6 percent increase for the state of Montana and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 5.5 percent from 1995 to 2005, with the state of Montana showing a 21.0 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 6.8 percent over the 1995-2005 period, while the state of Montana and the U.S. increased by 19.8 and 13.2 percent respectively.

Table 6-6. Benton Lake NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Cascade MT	79.5	-3.3%	50.2	5.3%	$30,647	16.7%
Chouteau MT	5.5	-6.6%	3.2	9.9%	$27,610	-2.4%
Area Total	**85.0**	**-3.5%**	**53.4**	**5.5%**	**$29,129**	**6.8%**
Montana	934.7	6.6 %	613.4	21.0 %	$29,015	19.8 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 6-7 shows the recreation visits for Benton Lake NWR. The Refuge had 9,100 visits in 2006. Non-consumptive recreation accounted for 8,600 visits and hunting 500 visits. Residents comprised 61 percent of Refuge visits.

Table 6-7. Benton Lake NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	600	400	1,000
Observation Platforms	0	0	0
Birding	4,380	2,920	7,300
Other Wildlife Observation	120	80	200
Beach /Water Use	0	0	0
Other Recreation	60	40	100
Hunting:			
Big Game	0	0	0
Small Game	80	20	100
Migratory Birds	320	80	400
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	***5,560***	***3,540***	***9,100***

Regional Economic Analysis

The economic area for the Refuge is Cascade and Chouteau Counties in Montana. It is assumed that visitor expenditures occur primarily within these two counties. Visitor recreation expenditures for 2006 are shown in Table 6-8. Total expenditures were $149,500 with non-residents accounting for $117,700 or 79 percent of total expenditures. Expenditures on non-consumptive activities accounted for 94 percent of all expenditures, followed by hunting with 6 percent.

Table 6-9 summarizes the local economic effects associated with recreation visits. Final demand totaled $213,300 with associated employment of 3 jobs, $61,000 in employment income and $28,100 in total tax revenue.

Table 6-8. Benton Lake NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$24.30	$102.54	$126.85
Other Non-Consumptive	$2.66	$11.24	$13.90
Total Non-Consumptive	$26.97	$113.78	$140.75
Hunting:			
Big Game	—	—	—
Small Game	$0.7	$1.2	$1.9
Migratory Birds	$4.1	$2.7	$6.8
Total Hunting	$4.8	$3.9	$8.7
Fishing:			
Freshwater	—	—	—
Saltwater	—	—	—
Total Fishing	—	—	—
Total Expenditures	***$31.8***	***$117.7***	***$149.5***

Table 6-9. Benton Lake NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$45.0	$168.3	$213.3
Jobs	1	2	3
Job Income	$12.5	$48.4	$61.0
Total Tax Revenue	$5.8	$22.3	$28.1

Table 6-10 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $0.13 means that for every $1 of budget expenditures, $0.13 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 6-10. Benton Lake NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Benton Lake NWR	$1,947.9	$149.5	$103.8	$0.13

Browns Park National Wildlife Refuge

Description

Browns Park National Wildlife Refuge was established in 1963 to provide habitat for migratory birds and to provide for suitable wildlife-dependent recreation. The Green River, the life blood of the Refuge, runs through the heart of its 13,455 acres.

Plants such as the threatened Ute's ladies tresses orchid and hundreds of species of animals depend on the habitat that the Refuge provides. Migrating waterfowl stop to refuel at Browns Park NWR, wintering elk and mule deer rely on the open grasslands, and the Refuge's cottonwood forests provide critical migration habitat for hundreds of thousands of Neotropical migratory songbirds. The shrublands also provide critical habitat for several species of concern including the loggerhead shrike, sage grouse, sage sparrow, sage thrasher, and Brewer's sparrow. Last, the Green River provides habitat for wintering bald eagles, nesting osprey, river otters, beaver, and the endangered Colorado pike minnow.

Area Economy

Browns Park NWR is located in northwestern Colorado near the Utah and Wyoming borders. Table 6-11 shows the area economy. The area population increased by 6.8 percent from 1995 to 2005, compared with a 21.9 percent increase for the state of Colorado and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 22.8 percent from 1995 to 2005, with the state of Colorado showing a 25.8 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 27.0 percent over the 1995-2005 period, while the state of Colorado and the U.S. increased by 17.3 and 13.2 percent respectively.

Table 6-11. Browns Park NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Moffat CO	13.4	9.6%	7.7	9.2%	$29,133	9.8%
Unita WY	19.9	-0.1%	12.5	12.5%	$32,595	36.7%
Unitah UT	27.1	11.0%	16.1	41.3%	$23,851	40.3%
Area Total	**60.4**	**6.8%**	**36.3**	**22.8%**	**$28,526**	**27.0%**
Colorado	4,663.3	21.9 %	3,071.1	25.8 %	$37,510	17.3 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 6-12 shows the recreation visits for Browns Park NWR. The Refuge had 5,360 visits in 2006. Non-consumptive recreation accounted for 3,900 visits, hunting 1,260 visits, and fishing 200 visits. Non-residents accounted for 95 percent of Refuge visits.

Table 6-12. Browns Park NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	20	371	390
Other Non-Consumptive	176	3,335	3,510
Hunting:			
Big Game	55	1,045	1,100
Small Game	1	19	20
Migratory Birds	7	133	140
Fishing:			
Freshwater	10	190	200
Saltwater	0	0	0
Total Visitation	***268***	***5,092***	***5,360***

Regional Economic Analysis

The economic area for the Refuge is Moffatt County in Colorado, Unita County in Wyoming, and Unitah County in Utah. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2006 are shown in Table 6-13. Total expenditures were $483,000 with non-residents accounting for $478,800 or 99 percent of total expenditures. Expenditures on non-consumptive activities accounted for 54 percent of all expenditures, followed by hunting and fishing at 43 and 3 percent respectively.

Table 6-14 summarizes the local economic effects associated with recreation visits. Final demand totaled $681,500 with associated employment of 10 jobs, $201,100 in employment income and $94,100 in total tax revenue.

Table 6-13. Browns Park NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$0.2	$26.0	$26.2
Other Non-Consumptive	$1.9	$234.2	$236.1
Total Non-Consumptive	$2.2	$260.2	$262.4
Hunting:			
Big Game	$1.8	$198.9	$200.7
Small Game	—	$2.2	$2.3
Migratory Birds	$0.1	$6.7	$6.9
Total Hunting	$1.9	$207.9	$209.9
Fishing:			
Freshwater	$0.1	$10.6	$10.8
Saltwater	—	—	—
Total Fishing	$0.1	$10.6	$10.8
Total Expenditures	***$4.3***	***$478.8***	***$483.0***

Table 6-14. Browns Park NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$6.4	$675.1	$681.5
Jobs	0.1	9.8	9.9
Job Income	$1.7	$199.4	$201.1
Total Tax Revenue	$0.8	$93.2	$94.1

Table 6-15 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. The FY2006 budget for Browns Park NWR included expenditures for fuel, utilities, internet service, construction projects, fleet vehicle purchase, contracted services, parts for vehicles and heavy equipment, office supplies, and building supplies. 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 $0.73 means that for every $1 of budget expenditures, $0.73 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. Browns Park NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Browns Park NWR	$870.8	$483.0	$154.8	$0.73

Charles M. Russell National Wildlife Refuge

Description

Located in north-central Montana, Charles M. Russell NWR is a 1.1-million-acre refuge that contains native prairies, forested coulees, river bottoms, badlands, and the 250,000-acre Ft. Peck Reservoir. Refuge wildlife include mule and white-tailed deer, elk, bighorn sheep, antelope, coyote, bobcat, beaver, sharp-tailed grouse, and numerous other species.

The refuge is spread across 6 counties: Fergus, Phillips, Petroleum, Garfield, Valley, and McCone. Paved highway access to the refuge is available on the western portion only where State Highway 191 crosses the Missouri River, and in the eastern portion in certain areas around Ft. Peck Reservoir. Gravel and dirt roads provide access to most of the recreation facilities within the refuge. Eight of those facilities are administered by the Army Corps of Engineers, two by the state of Montana, one by the U.S. Bureau of Land Management, and two by the U.S. Fish and Wildlife Service. Nine of these facilities provide boat-launching ramps.

Area Economy

Charles M. Russell NWR is located in northeastern Montana. Table 6-16 shows the area economy. The area population decreased by 12.3 percent from 1995 to 2005, compared with a 6.6 percent increase for the state of Montana and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 5.4 percent from 1995 to 2005, with the state of Montana showing a 21.0 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 34.3 percent over the 1995-2005 period, while the state of Montana and the U.S. increased by 19.8 and 13.2 percent respectively.

Table 6-16. Charles M. Russell NWR: Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Fergus MT	11.5	-8.4%	7.7	11.1%	$27,463	27.4%
Phillips MT	4.1	-19.1%	2.7	-7.1%	$24,156	22.6%
Valley MT	7.1	-12.8%	4.8	2.1%	$31,328	24.7%
McCone MT	1.8	-18.1%	1.3	6.9%	$25,224	37.0%
Garfield MT	1.2	-10.4%	0.9	9.5%	$30,103	63.9%
Petroleum MT	0.5	-9.8%	0.4	30.5%	$22,058	36.3%
Area Total	**26.2**	**-12.3%**	**17.7**	**5.4%**	**$26,722**	**34.3%**
Montana	934.7	6.6 %	613.4	21.0 %	$29,015	19.8 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 6-17 shows the recreation visits for Charles M. Russell NWR. The Refuge had 233,081 visits in 2006. Hunting accounted for 105,155 visits, non-consumptive recreation 67,826 visits, and fishing 60,100 visits. Non-residents accounted for 152,122 visits or 65 percent of Refuge visits. "Other wildlife viewing" includes visitors to the auto tour route that view elk, turkeys, migratory birds, grouse, and other resident wildlife.

Table 6-17. Charles M. Russell NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	50	150	200
Observation Platforms	0	0	0
Wildlife Observation	9,625	28,875	38,500
Beach /Water Use	150	150	300
Other Recreation	10,089	18,737	28,826
Hunting:			
Big Game	27,225	63,525	90,750
Small Game	2,758	8,273	11,030
Migratory Birds	1,013	2,363	3,375
Fishing:			
Freshwater	30,050	30,050	60,100
Saltwater	0	0	0
Total Visitation	***80,959***	***152,122***	***233,081***

Regional Economic Analysis

The following counties in Montana comprise the economic area for the Refuge: Fergus, Phillips, Valley, McCone, Garfield, and Petroleum. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2006 are shown in Table 6-18. Total expenditures were $14.2 million with non-residents accounting for $13.0 million or 91 percent of total expenditures. Expenditures on hunting activities accounted for 74 percent of all expenditures, followed by fishing and non-consumptive recreation at 15 and 11 percent respectively.

Table 6-18. Charles M. Russell NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:	$80.1	$1,521.0	$1,601.1
Hunting:			
Big Game	$663.9	$9,070.0	$9,733.9
Small Game	$33.1	$648.8	$681.9
Migratory Birds	$13.1	$79.9	$92.9
Total Hunting	$710.1	$9,798.7	$10,508.8
Fishing:			
Freshwater	$439.4	$1,683.0	$2,122.4
Saltwater	—	—	—
Total Fishing	$439.4	$1,683.0	$2,122.4
Total Expenditures	***$1,229.6***	***$13,002.7***	***$14,232.3***

Table 6-19 summarizes the local economic effects associated with recreation visits. Final demand totaled $14.4 million with associated employment of 232 jobs, $4.2 million in employment income and $2.0 million in total tax revenue.

Table 6-19. Charles M. Russell NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$1,187.7	$13,213.2	$14,400.9
Jobs	19	2133	232
Job Income	$334.2	$3,901.6	$4,235.8
Total Tax Revenue	$162.3	$1,865.3	$2,027.6

Table 6-20 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $8.66 means that for every $1 of budget expenditures, $8.66 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. Charles M. Russell NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Charles M. Russell NWR	$2,369.2	$14,232.3	$6,287.8	$8.66

Huron Wetland Management District

Description

Huron Wetland Management District (WMD) was created on May 31, 1992. Huron WMD covers eight counties in east-central South Dakota. The topography of this area ranges from flat, gently rolling drift prairie to the Missouri Coteau hills in the western end of the District. The District lies in the midst of the world renowned "prairie pothole" region. The public lands of Huron Wetland Management District, called waterfowl production areas (WPAs), are a part of the National Wildlife Refuge System. National wildlife refuges and WPAs are vitally important to wildlife and people. These lands are managed to provide habitat for endangered species, migratory birds, and other wildlife and to provide places for people to learn about and enjoy wildlife.

WPAs are open to many public activities year-round. Visitors to WPAs can expect to find a rich variety of plant and animal life.

Area Economy

Huron WMD is located in east central South Dakota. Table 6-21 shows the area economy. The area population decreased by 13.0 percent from 1995 to 2005, compared with a 5.0 percent increase for the state of South Dakota and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 0.4 percent from 1995 to 2005, with the state of South Dakota showing a 13.2 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 45.4 percent over the 1995-2005 period, while the state of South Dakota and the U.S. increased by 26.3 and 13.2 percent respectively.

Table 6-21. Huron WMD:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Beadle SD	15.9	-13.6%	10.6	-8.5%	$34,409	33.1%
Hand SD	3.3	-17.0%	2.4	2.6%	$38,678	65.3%
Hyde SD	1.6	-6.7%	1.1	13.9%	$30,566	46.7%
Sanborn SD	2.5	-8.5%	1.5	4.1%	$40,726	73.8%
Jerauld SD	2.1	-13.5%	2.0	56.8%	$34,182	47.9%
Sully SD	1.4	-10.0%	1.2	6.9%	$49,119	23.0%
Area Total	**26.9**	**-13.0%**	**18.7**	**0.4%**	**$37,947**	**45.4%**
South Dakota	774.9	5.0 %	537.7	13.2 %	$32,523	26.3 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 6-22 shows the recreation visits for Huron WMD. The Refuge had 26,800 visits in 2006. Hunting accounted for 25,000 visits and non-consumptive recreation accounted for 1,800 visits. Residents accounted for 68 percent of Refuge visits.

Table 6-22. Huron WMD: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	300	700	1,000
Observation Platforms	150	350	500
Birding	60	140	200
Other Wildlife Observation	30	70	100
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	10,800	1,200	12,000
Small Game	4,000	6,000	10,000
Migratory Birds	2,850	150	3,000
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	***18,190***	***8,610***	***26,800***

Regional Economic Analysis

The following counties in South Dakota comprise the economic area for the WMD: Beadle, Hand, Hyde, Sanborn, Jerauld and Sully. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2006 are shown in Table 6-23. Total expenditures were $1.0 million with non-residents accounting for $804,900 or 80 percent of total expenditures. Expenditures on hunting accounted for 96 percent of all expenditures, and non-consumptive expenditures accounted for 4 percent.

Table 6-23. Huron WMD: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$0.3	$4.9	$5.2
Other Non-Consumptive	$2.2	$32.0	$34.1
Total Non-Consumptive	$2.5	$36.9	$39.4
Hunting:			
Big Game	$87.8	$57.1	$144.9
Small Game	$72.1	$705.9	$778.0
Migratory Birds	$36.8	$5.1	$41.8
Total Hunting	$196.6	$768.1	$964.7
Fishing:			
Freshwater	—	—	—
Saltwater	—	—	—
Total Fishing	—	—	—
Total Expenditures	***$199.1***	***$804.9***	***$1,004.1***

Table 6-24 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.3 million with associated employment of 20 jobs, $372,500 in employment income and $164,000 in total tax revenue.

Table 6-24. Huron WMD: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$255.5	$1,018.5	$1,273.9
Jobs	4	16	20
Job Income	$71.6	$300.9	$372.5
Total Tax Revenue	$32.6	$131.3	$164.0

Table 6-25 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $1.45 means that for every $1 of budget expenditures, $1.45 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 6-25. Huron WMD: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Huron WMD	$1,118.7	$1,004.1	$619.9	$1.45

Madison Wetland Management District

Description

The Madison Wetland Management District (WMD) was established to preserve wetlands and manage habitat for waterfowl and other wildlife. Headquartered in Madison, South Dakota, the District staff manages 38,500 acres of upland and wetland areas, called waterfowl production areas (WPA). The wetlands found on WPAs also help prevent flooding in rainy years by storing the water while it slowly percolates into the ground. The northeast portion of the District (Deuel County) lies within the "Coteau des Prairie" or tall grass prairie region of South Dakota.

The District staff also administer two easement programs with private landowners. One is a wetland easement program consisting of 52,200 acres of wetlands that are protected from drainage. The second is a grassland easement program that protects 39,000 acres of grasslands from plowing.

Lands are acquired, in part, by the U.S. Fish and Wildlife Service (Service) with funds from the sale of Federal Duck Stamps.

Area Economy

Madison WMD is located in eastcentral South Dakota. Table 6-26 shows the area economy. The area population increased by 10.3 percent from 1995 to 2005, compared with a 5.0 percent increase for the state of South Dakota and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 18.2 percent from 1995 to 2005, with the state of South Dakota showing a 13.2 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 31.4 percent over the 1995-2005 period, while the state of South Dakota and the U.S. increased by 26.3 and 13.2 percent respectively.

Table 6-26. Madison WMD:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
9 County area	229.4	10.3%	181.2	18.2%	$30,768	31.4%
South Dakota	774.9	5.0 %	537.7	13.2 %	$32,523	26.3 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 6-27 shows the recreation visits for Madison WMD. The WMD had 127,469 visits in 2006. Hunting accounted for 93,173 visits, fishing for 29,200 visits and non-consumptive recreation for 5,096. Residents accounted for 83,095 visits, or 65 percent of WMD visits.

Table 6-27. Madison WMD: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	1,482	78	1,560
Observation Platforms	0	0	0
Wildlife Observation	3,359	177	3,536
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	28,557	1,503	30,060
Small Game	14,011	23,791	37,803
Migratory Birds	20,501	4,809	25,310
Fishing:			
Freshwater	15,184	14,016	29,200
Saltwater	0	0	0
Total Visitation	***83,095***	***44,374***	***127,469***

Regional Economic Analysis

The following counties in South Dakota comprise the economic area for the WMD: Duel, Hamlin, Kingsbury, Miner, McCook, Lake, Minehaha, Moody, and Brookings. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2006 are shown in Table 6-28. Total expenditures were $4.6 million with non-residents accounting for $3.1 million or 67 percent of total expenditures. Expenditures on hunting accounted for 78 percent of all expenditures, followed by fishing and non-consumptive use at 22 and less than 1 percent respectively.

Impacts will are expected to be higher in future years as visitor counts become more accurate. In FY2007, the refuge anticipates about 200,000 visitors (a 3x increase) due to better accuracy.

Table 6-28. Madison WMD: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:	$13.4	$4.5	$17.9
Hunting:			
Big Game	$812.5	$250.4	$1,062.9
Small Game	$128.4	$1,866.0	$1,994.4
Migratory Birds	$330.5	$203.2	$533.7
Total Hunting	$1,271.4	$2,319.6	$3,591.0
Fishing:			
Freshwater	$222.0	$785.0	$1,007.0
Saltwater	—	—	—
Total Fishing	$222.0	$785.0	$1,007.0
Total Expenditures	***$1,506.9***	***$3,109.0***	***$4,615.9***

Table 6-29 summarizes the local economic effects associated with recreation visits. Final demand totaled $6.9 million with associated employment of 80 jobs, nearly $2.1 million in employment income and $928,100 in total tax revenue.

Table 6-29. Madison WMD: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$2,287.8	$4,620.1	$6,907.9
Jobs	26	54	80
Job Income	$666.5	$1,415.8	$2,082.3
Total Tax Revenue	$302.5	$625.7	$928.1

Table 6-30 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $9.48 means that for every $1 of budget expenditures, $9.48 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 6-30. Madison WMD: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Madison WMD	$882.2	$4,615.9	$3,748.4	$9.48

Monte Vista National Wildlife Refuge

Description

Monte Vista National Wildlife Refuges is found in the heart of Colorado's San Luis valley. The artificially created wetlands on Monte Vista NWR's 14,804 acres are intensively managed to provide habitat for a wide variety of waterfowl and other water birds. Mallards, pintail, teal, and Canada geese are common, as are American avocets, killdeer, white-faced ibis, egrets, and herons. Irrigation canals and wells provide precious water to maintain important wetland habitat.

Area Economy

Monte Vista NWR is located in southern Colorado. Table 6-31 shows the area economy. The county population increased by 5.6 percent from 1995 to 2005, compared with a 21.9 percent increase for the state of Colorado and a 11.4 percent increase for the U.S. as a whole. County employment increased by 31.4 percent from 1995 to 2005, with the state of Colorado showing a 25.8 percent increase and the U.S. a 17.0 percent increase. County per capita income increased by 8.4 percent over the 1995-2005 period, while the state of Colorado and the U.S. increased by17.3 and 13.2 percent respectively.

Table 6-31. Monte Vista NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Rio Grande CO	12.3	5.6%	7.9	31.4%	$26,793	8.4%
Colorado	4,663.3	21.9 %	3,071.1	25.8 %	$37,510	17.3 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 6-32 shows the recreation visits for Monte Vista NWR. The Refuge had 5,750 visits in 2006. Almost all of the visits were for non-consumptive recreation with non-residents accounting for 57 percent of Refuge visits.

Table 6-32. Monte Vista NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	40	60	100
Observation Platforms	800	1,200	2,000
Birding	1,200	1,800	3,000
Other Wildlife Observation	400	100	500
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	60	90	150
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	***2,500***	***3,250***	***5,750***

Regional Economic Analysis

The economic area for the Refuge is Rio Grande County in Colorado. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 6-33. Total expenditures were $68,000 with non-residents accounting for $60,000 or 88 percent of total expenditures. Expenditures on non-consumptive activities accounted for 92 percent of all expenditures, followed by hunting at 8 percent.

Table 6-33. Monte Vista NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$3.33	$31.61	$34.93
Other Non-Consumptive	$3.44	$23.88	$27.32
Total Non-Consumptive	$6.77	$55.49	$62.25
Hunting:			
Big Game	—	—	—
Small Game	—	—	—
Migratory Birds	$1.2	$4.6	$5.7
Total Hunting	$1.2	$4.6	$5.7
Fishing:			
Freshwater	—	—	—
Saltwater	—	—	—
Total Fishing	—	—	—
Total Expenditures	***$7.9***	***$60.0***	***$68.0***

Table 6-34 summarizes the local economic effects associated with recreation visits. Final demand totaled $80,400 with associated employment of 1 job, $25,900 in employment income and $11,300 in total tax revenue.

Table 6-34. Monte Vista NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$9.6	$70.8	$80.4
Jobs	0	1	1
Job Income	$2.9	$23.0	$25.9
Total Tax Revenue	$1.3	$10.0	$11.3

Table 6-35 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $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 6-35. Monte Vista NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Monte Vista NWR	$690.7	$68.0	$37.4	$0.15

Quivira National Wildlife Refuge

Description

The establishment of Quivira NWR was approved by the Migratory Bird Conservation Commission on May 3, 1955, and acquisition of the 21,820 acres was completed in 1969. The natural and developed marshes on the refuge provide resting and feeding areas for spring and fall migrating waterfowl and wintering habitat for mallards and Canada geese. In addition, thousands of shorebirds and sandhill cranes use the refuge during migration in the spring and fall. Whooping cranes, bald eagles, and interior least terns use the refuge as well. Summer residents include white pelicans, gulls, various hawks, avocets, egrets, and many others. Ring-necked pheasants, bobwhite quail, wild turkey, white-tailed deer, prairie dogs, and coyotes are commonly seen.

The refuge has 21 miles of canals through which water is diverted to over 30 wetlands ranging in size from 10 to 1,500 acres and totaling over 5,000 acres. Hunting and fishing are permitted on 8,000 acres of the refuge in accordance with state seasons. The refuge is an excellent birding area.

Area Economy

Kansas NWR is located in south central Kansas. Table 6-36 shows the area economy. The area population decreased by 2.2 percent from 1995 to 2005, compared with a 5.7 percent increase for the state of Kansas and a 11.4 percent increase for the U.S. as a whole. Area employment decreased by 2.5 percent from 1995 to 2005, with the state of Kansas showing a 11.9 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 12.0 percent over the 1995-2005 period, while the state of Kansas and the U.S. increased by 15.5 and 13.2 percent respectively.

Table 6-36. Quivira NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Stafford KS	4.5	-12.2%	2.5	-17.5%	$27,097	10.9%
Reno KS	63.5	0.1%	36.7	-3.8%	$27,109	4.5%
Rice KS	10.4	-3.0%	4.9	-6.3%	$22,176	4.9%
Barton KS	27.6	-5.4%	19.8	3.5%	$31,460	26.8%
Area Total	**106.0**	**-2.2%**	**63.9**	**-2.5%**	**$26,961**	**12.0%**
Kansas	2748.2	5.7 %	1,800.5	11.9 %	$32,866	15.5 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 6-37 shows the recreation visits for Quivira NWR. The Refuge had 156,300 visits in 2006. Non-consumptive recreation visits totaled 144,000, or 92 percent of all Refuge visits. Non-residents accounted for 60 percent of all Refuge visits.

Table 6-37. Quivira NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	16,400	24,600	41,000
Observation Platforms	1,200	1,800	3,000
Birding	32,000	48,000	80,000
Other Wildlife Observation	8,000	12,000	20,000
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	0	0	0
Small Game	720	2,880	3,600
Migratory Birds	1,040	4,160	5,200
Fishing:			
Freshwater	2,800	700	3,500
Saltwater	0	0	0
Total Visitation	***62,160***	***94,140***	***156,300***

Regional Economic Analysis

The following counties in Kansas comprise the economic area for the Refuge: Stafford, Reno, Rice, and Barton. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2006 are shown in Table 6-38. Total expenditures were $3.7 million with non-residents accounting for $3.3 million or 90 percent of total expenditures. Expenditures on non-consumptive activities accounted for 90 percent of all expenditures, followed by hunting and fishing at 9 and 1 percent respectively.

Table 6-38. Quivira NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$177.57	$1,685.62	$1,863.19
Other Non-Consumptive	$138.73	$1,316.89	$1,455.62
Total Non-Consumptive	$316.30	$3,002.52	$3,318.81
Hunting:			
Big Game	—	—	—
Small Game	$6.5	$169.4	$175.9
Migratory Birds	$13.4	$140.7	$154.1
Total Hunting	$19.9	$310.1	$330.0
Fishing:			
Freshwater	$20.5	$19.6	$40.1
Saltwater	—	—	—
Total Fishing	$20.5	$19.6	$40.1
Total Expenditures	***$356.7***	***$3,332.2***	***$3,688.9***

Table 6-39 summarizes the local economic effects associated with recreation visits. Final demand totaled $5.3 with associated employment of 74 jobs, $1.6 million in employment income and $737,000 in total tax revenue.

Table 6-39. Quivira NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$517.4	$4,766.3	$5,283.6
Jobs	7	67	74
Job Income	$154.2	$1,449.1	$1,603.3
Total Tax Revenue	$71.9	$665.1	$737.0

Table 6-40 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $3.96 means that for every $1 of budget expenditures, $3.96 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. Quivira NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Quivira NWR	$1,400.0	$3,688.9	$1,858.5	$3.96

Rainwater Basin Wildlife Management District

Description

The Rainwater Basin Wetland Management District (WMD) staff manages 61 tracts of wetlands, totaling 23,059 acres scattered over more than 14 counties in southeastern Nebraska. Each of the 61 areas, known as waterfowl production areas (WPA), is located in a geographic area known as the Rainwater Basin. The name "Rainwater Basin" originates from the geologic formation of large, wind-blown shallow depressions, which become flooded after rain and snow melt.

WPAs are managed to provide resting stops for millions of migratory water birds. Upland areas are managed for grassland species. WPAs provide excellent recreational opportunities, including hunting, photography, and bird watching.

Area Economy

Rainwater Basin WMD is located in southeastern Nebraska. Table 6-41 shows the area economy. The area population increased by 2.7 percent from 1995 to 2005, compared with a 6.1 percent increase for the state of Nebraska and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 6.6 percent from 1995 to 2005, with the state of Nebraska showing a 13.0 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 7.5 percent over the 1995-2005 period, while the state of Nebraska and the U.S. increased by 14.8 and 13.2 percent respectively.

Table 6-41. Rainwater Basin WMD:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
12 County Area	177.6	2.7%	118.1	6.6%	$28,912	7.5%
Nebraska	1,758.2	6.1 %	1,217.7	13.0 %	$32,923	14.8 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 6-42 shows the recreation visits for Rainwater Basin WMD. The Refuge had 62,000 visits in 2006. Non-consumptive recreation accounted for 33,000 visits and hunting accounted for 29,000 visits. Residents accounted for 51,000 visits, or 83 percent of all visits.

Table 6-42. Rainwater Basin WMD: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	850	150	1,000
Observation Platforms	0	0	0
Birding	25,500	4,500	30,000
Other Wildlife Observation	850	150	1,000
Beach /Water Use	0	0	0
Other Recreation	900	100	1,000
Hunting:			
Big Game	1,800	200	2,000
Small Game	17,600	4,400	22,000
Migratory Birds	3,500	1,500	5,000
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	***51,000***	***11,000***	***62,000***

Regional Economic Analysis

The following counties in Nebraska comprise the economic area for the WMD: Gosper, Phelps, Kearney, Franklin, Adams, Hall, Hamilton, Clay, Filmore, York, Seward, and Saline. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 6-43. Total expenditures were $734,800 with non-residents accounting for $419,000 or 57 percent of total expenditures. Expenditures on hunting totaled $561,600, and non-consumptive recreation $173,250.

Table 6-43. Rainwater Basin WMD: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$70.75	$79.01	$149.76
Other Non-Consumptive	$12.07	$11.41	$23.48
Total Non-Consumptive	$82.82	$90.43	$173.25
Hunting:			
Big Game	$29.3	$19.0	$48.3
Small Game	$158.6	$258.8	$417.4
Migratory Birds	$45.1	$50.7	$95.9
Total Hunting	$233.0	$328.6	$561.6
Fishing:			
Freshwater	—	—	—
Saltwater	—	—	—
Total Fishing	—	—	—
Total Expenditures	***$315.8***	***$419.0***	***$734.8***

Table 6-44 summarizes the local economic effects associated with recreation visits. Final demand totaled nearly $1.1 million with associated employment of 14 jobs, $304,900 in employment income and $137,00 in total tax revenue.

Table 6-44. Rainwater Basin WMD: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$474.5	$606.5	$1,081.0
Jobs	6	9	14
Job Income	$128.1	$176.8	$304.9
Total Tax Revenue	$58.8	$78.3	$137.0

Table 6-45 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $1.05 means that for every $1 of budget expenditures, $1.05 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 6-45. Rainwater Basin WMD: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Rainwater Basin WMD	$1,447.3	$734.8	$788.7	$1.05

Region 7

Region 7 includes the State of Alaska. Sample refuges selected within the region include:

Alaska Maritime NWR
Alaska Peninsula NWR
Kenai NWR
Kodiak NWR
Tetlin NWR

Alaska Maritime National Wildlife Refuge

Description

Alaska Maritime National Wildlife Refuge is a place of great distances and greater dramas. Here winds whip through the grasses of rugged, wave-pounded islands; and active volcanoes simmer, venting steam above collars of fog. It is a place of contrasts, where relics of a past war slowly rust in deserted valleys, while, nearby, great forests of kelp team with life. It is, and has long been, a place of refuge, and has seen some of the most dramatic wildlife conservation stories in our nation's history.

Containing some of the first conservation-unit areas to be established in America, today's Alaska Maritime National Wildlife Refuge includes lands that were formerly parts of ten previously established refuges. Many of these units are still represented among the ten distinct congressionally-designated wilderness areas included in Alaska Maritime, which range in size from the approximately 1.3 million acre Aleutian Islands Wilderness to the 32 acre Hazy Islands Wilderness. Because it is spread out along most of the 47,300 miles of Alaska's coastline, the sheer span of this refuge is difficult to grasp. Its more than 2,500 islands, islets, spires, rocks, reefs, waters and headlands extend from Forrester Island, to the north of Canada's Queen Charlotte Islands deep in the southeast tongue of the state, to the westernmost tip of the Aleutians (and of America!), and north to Cape Lisburne on the Arctic Ocean. Traveling between its farthest-flung points would be the equivalent of taking a trip from Georgia to California.

No other maritime National Wildlife Refuge in America is as large or as productive. Alaska Maritime's seashore lands provide nesting habitat for approximately 40 million seabirds, or about 80 percent of Alaska's nesting seabird population.

Area Economy

Alaska Maritime NWR is located in numerous coastal locations in southern and western Alaska. Table 7-1 shows the area economy. The area population increased by 4.5 percent from 1995 to 2005, compared with a 9.7 percent increase for the state of Alaska and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 12.6 percent from 1995 to 2005, with the state of Alaska showing a 19.0 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 1.9 percent over the 1995-2005 period, while the state of Alaska and the U.S. increased by 5.6 and 13.2 percent respectively.

Table 7-1. Alaska Maritime NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
8 Borough/Census areas	107.4	4.5%	74.1	12.6%	$30,182	1.9%
Alaska	663.3	9.7 %	437.0	19.0 %	$35,564	5.6 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 7-2 shows the recreation visits for Alaska Maritime NWR. The Refuge had 110,750 visits in 2006. Almost all of the visits were for non-consumptive recreation, with 83,355 non-resident visits accounting for 75 percent of Refuge visits.

Table 7-2. Alaska Maritime NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	18,000	2,000	20,000
Observation Platforms	0	0	0
Birding	8,900	80,100	89,000
Other Wildlife Observation	100	900	1,000
Beach /Water Use	90	10	100
Other Recreation	90	10	100
Hunting:			
Big Game	30	120	150
Small Game	27	3	30
Migratory Birds	18	2	20
Fishing:			
Freshwater	90	10	100
Saltwater	50	200	250
Total Visitation	***27,395***	***83,355***	***110,750***

Regional Economic Analysis

The economic area for the Refuge is comprised of eight areas in Alaska: Aleutians East Borough, Aleutians West Census Area, Kodiak Island Borough, Lake and Peninsula Borough, Kenai Peninsula Borough, Sitka City and Borough, North Slope Borough, and Bethel Census Area. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2006 are shown in Table 7-3. Total expenditures were $21.5 million with non-residents accounting for $21.2 million or 99 percent of total expenditures. Expenditures on non-consumptive activities accounted for 99 percent of all expenditures, followed by hunting and fishing at less than 1 percent each respectively.

Table 7-3. Alaska Maritime NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$237.3	$20,836.9	$21,074.2
Other Non-Consumptive	$63.3	$299.8	$363.1
Total Non-Consumptive	$300.6	$21,136.7	$21,437.3
Hunting:			
Big Game	$1.2	$10.2	$11.4
Small Game	$0.1	$0.2	$0.4
Migratory Birds	$0.7	$0.3	$0.9
Total Hunting	$2.0	$10.7	$12.7
Fishing:			
Freshwater	$1.5	$2.1	$3.7
Saltwater	$1.5	$30.2	$31.6
Total Fishing	$3.0	$32.3	$35.3
Total Expenditures	***$305.6***	***$21,179.7***	***$21,485.3***

Table 7-4 summarizes the local economic effects associated with recreation visits. Final demand totaled $25.9 with associated employment of 298 jobs, $10.8 million in employment income and $3.5 million in total tax revenue.

Table 7-4. Alaska Maritime NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$262.3	$25,624.4	$25,886.7
Jobs	4	294	298
Job Income	$119.9	$10,688.2	$10,808.1
Total Tax Revenue	$37.1	$3,486.7	$3,523.8

Table 7-5 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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

$1.68 means that for every $1 of budget expenditures, $1.68 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 Maritime NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Alaska Maritime NWR	$3,793.0	$2,1485.3	$4,214.5	$1.68

Alaska Peninsula National Wildlife Refuge

Description

Sandwiched between Becharof National Wildlife Refuge to the north and Izembek NWR to the south, Alaska Peninsula National Wildlife Refuge presents a breathtakingly dramatic landscape made up of active volcanoes, towering mountain peaks, rolling tundra and rugged, wave-battered coastlines. As is the case with most of Alaska's coastal refuges, salmon provide the principal "nutrient engine" for Alaska Peninsula, supporting the species that prey upon them and enriching the rivers and surrounding lands after they spawn and die.

Where there are salmon, there will usually be bears, and when the fish are running, Ugashik Lakes and the streams that surround them attract brown bears in great numbers. Other large land mammals include wolverine, the caribou of the approximately 7,000-animal 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.

Alaska Peninsula's numerous wetlands and often rugged shoreline provide habitat for migratory birds, including ducks, geese and shorebirds. The refuge is also home to the westernmost black cottonwood forests in America, which offer both migration stop-over and nesting habitat to neotropical land birds.

Area Economy

Alaska Peninsula NWR is located in southwestern Alaska. Table 7-6 shows the area economy. The area population increased by 9.1 percent from 1995 to 2005, compared with a 9.7 percent increase for the state of Alaska and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 18.7 percent from 1995 to 2005, with the state of Alaska showing a 19.0 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 2.3 percent over the 1995-2005 period, while the state of Alaska and the U.S. increased by 5.6 and 13.2 percent respectively.

Table 7-6. Alaska Peninsula NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
Area	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Anchorage	275.5	9.3%	197.9	19.0%	$40,670	8.5%
Bristol Bay	1.1	-3.6%	1.8	13.5%	$43,966	-10.8%
L and P Borough	1.6	-13.9%	0.9	-14.6%	$26,027	21.9%
Area Total	**278.2**	**9.1%**	**200.5**	**18.7%**	$36,888	2.3%
Alaska	663.3	9.7 %	437.0	19.0 %	$35,564	5.6 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 7-7 shows the recreation visits for Alaska Peninsula NWR. The Refuge had 3,315 visits in 2006. Hunting accounted for 1,888 visits, fishing 1,322 visits and non-consumptive recreation 105 visits. Non-residents accounted for 56 percent of all Refuge visits.

Table 7-7. Alaska Peninsula NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	0	0	0
Observation Platforms	0	0	0
Birding	6	34	40
Other Wildlife Observation	1	10	10
Beach /Water Use	3	3	5
Other Recreation	49	1	50
Hunting:			
Big Game	585	915	1,500
Small Game	189	44	233
Migratory Birds	84	71	155
Fishing:			
Freshwater	542	780	1,322
Saltwater	0	0	0
Total Visitation	***1,457***	***1,858***	***3,315***

Regional Economic Analysis

The economic area for the Refuge is comprised of the following areas in Alaska: Anchorage Municipality, Bristol Bay Borough, and Lake and Peninsula Borough. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2006 are shown in Table 7-8. Total expenditures were $342,000 with non-residents accounting for $302,800 or 89 percent of total expenditures. Expenditures on fishing accounted for 64 percent of all expenditures, followed by hunting and non-consumptive activities at 34 and 2 percent respectively.

Table 7-8. Alaska Peninsula NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$0.1	$3.3	$3.4
Other Non-Consumptive	$0.7	$1.7	$2.4
Total Non-Consumptive	$0.8	$5.0	$5.8
Hunting:			
Big Game	$23.2	$77.9	$101.0
Small Game	$1.2	$4.3	$5.5
Migratory Birds	$2.6	$7.7	$10.3
Total Hunting	$27.0	$89.8	$116.8
Fishing:			
Freshwater	$11.5	$207.9	$219.4
Saltwater	—	—	—
Total Fishing	$11.5	$207.9	$219.4
Total Expenditures	***$39.2***	***$302.8***	***$342.0***

Table 7-9 summarizes the local economic effects associated with recreation visits. Final demand totaled $396,100 with associated employment of 5 jobs, $164,900 in employment income and $56,300 in total tax revenue.

Table 7-9. Alaska Peninsula NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$36.5	$359.6	$396.1
Jobs	1	4	5
Job Income	$17.4	$147.5	$164.9
Total Tax Revenue	$5.4	$50.9	$56.3

Table 7-10 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $0.24 means that for every $1 of budget expenditures, $0.24 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 7-10. Alaska Peninsula NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Alaska Peninsula NWR	$1,944.0	$342.0	$131.4	$0.24

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 a "miniature Alaska." Today, the refuge includes examples of every major Alaska habitat type. The refuge is an Alaska in miniature in its diversity of wildlife, as well. 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 wildlife draws a half a million visitors a year, more than any other wildlife refuge in Alaska.

Area Economy

Kenai NWR is located in southcentral Alaska. Table 7-11 shows the area economy. The borough population increased by 10.8 percent from 1995 to 2005, compared with a 9.7percent increase for the state of Alaska and a 11.4 percent increase for the U.S. as a whole. Borough employment increased by 21.0 percent from 1995 to 2005, with the state of Alaska showing a 19.0 percent increase and the U.S. a 17.0 percent increase. Borough per capita income decreased by 2.2 percent over the 1995-2005 period, while the state of Alaska and the U.S. increased by 5.6 and 13.2 percent respectively.

Table 7-11. Kenai NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
Borough	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Kenai Peninsula Borough AK	51.8	10.8%	30.7	21.0%	$30,795	-2.2%
Alaska	663.3	9.7 %	437.0	19.0 %	$35,564	5.6 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 7-12 shows the recreation visits for Kenai NWR. The Refuge had 659,525 visits in 2006. Non-consumptive recreation accounted for 393,000 visits, fishing 248,000 visits and hunting 18,525. Residents accounted for 66 percent of all Refuge visits.

Table 7-12. Kenai NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	111,000	37,000	148,000
Observation Platforms	4,000	1,000	5,000
Birding	5,000	5,000	10,000
Other Wildlife Observation	75,000	75,000	150,000
Beach /Water Use	15,000	5,000	20,000
Other Recreation	57,000	3,000	60,000
Hunting:			
Big Game	4,950	550	5,500
Small Game	5,049	51	5,100
Migratory Birds	7,529	396	7,925
Fishing:			
Freshwater	148,800	99,200	248,000
Saltwater	0	0	0
Total Visitation	***433,328***	***226,197***	***659,525***

Regional Economic Analysis

The economic area for the Refuge is the Kenai Peninsula Borough in Alaska. It is assumed that visitor expenditures occur primarily within this Borough. Visitor recreation expenditures for 2006 are shown in Table 7-13. Total expenditures were $54.6 million with non-residents accounting for $45.9 million or 84 percent of total expenditures. Expenditures on fishing accounted for 65 percent of all expenditures, followed by non-consumptive activities and hunting at 34 and 1 percent respectively.

Table 7-13. Kenai NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$100.0	$975.5	$1,075.5
Other Non-Consumptive	$4,303.6	$13,071.8	$17,375.4
Total Non-Consumptive	$4,403.6	$14,047.3	$18,451.0
Hunting:			
Big Game	$196.1	$46.8	$242.9
Small Game	$31.5	$4.9	$36.4
Migratory Birds	$281.2	$51.3	$332.6
Total Hunting	$508.8	$103.1	$611.9
Fishing:			
Freshwater	$3,791.8	$31,729.9	$35,521.7
Saltwater	—	—	—
Total Fishing	$3,791.8	$31,729.9	$35,521.7
Total Expenditures	***$8,704.2***	***$45,880.4***	***$54,584.6***

Table 7-14 summarizes the local economic effects associated with recreation visits. Final demand totaled $59.0 million with associated employment of 734 jobs, $24.3 million in employment income and $8.6 million in total tax revenue.

Table 7-14. Kenai NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$7,381.1	$51,644.3	$59,025.4
Jobs	100	634	734
Job Income	$3,396.9	$20,860.4	$24,257.3
Total Tax Revenue	$1,134.9	$7,477.5	$8,612.4

Table 7-15 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $21.75 means that for every $1 of budget expenditures, $21.75 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. Kenai NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Kenai NWR	$3,431.6	$54,584.6	$20,066.2	$21.75

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

Kodiak NWR is located on the coast of southwestern Alaska. Table 7-16 shows the area economy. The area population increased by 8.3 percent from 1995 to 2005, compared with a 9.7 percent increase for the state of Alaska and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 17.8 percent from 1995 to 2005, with the state of Alaska showing a 19.0 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 9.8percent over the 1995-2005 period, while the state of Alaska and the U.S. increased by 5.6 and 13.2 percent respectively.

Table 7-16. Kodiak NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
Area	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Anchorage AK	275.5	9.3%	197.9	19.0%	$40,670	8.5%
Kodiak Island AK	13.1	-9.7%	9.2	-3.8%	$32,896	11.5%
Area Total	**288.5**	**8.3%**	**207.1**	**17.8%**	**$36,783**	**9.8%**
Alaska	663.3	9.7 %	437.0	19.0 %	$35,564	5.6 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 7-17 shows the recreation visits for Kodiak NWR. The Refuge had 10,468 visits in 2006. Hunting accounted for 7,030 visits, fishing 2,210 and non-consumptive 1,228 visits. Non-residents accounted for 69 percent of all Refuge visits.

Table 7-17. Kodiak NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	0	0	0
Observation Platforms	0	0	0
Wildlife Observation	75	674	749
Beach /Water Use	0	0	0
Other Recreation	48	431	479
Hunting:			
Big Game	2,526	3,788	6,314
Small Game	128	128	256
Migratory Birds	46	414	460
Fishing:			
Freshwater	442	1,768	2,210
Saltwater	0	0	0
Total Visitation	***3,264***	***7,204***	***10,468***

Regional Economic Analysis

The economic area for the Refuge is Anchorage Municipality and Kodiak Island Borough in Alaska. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2006 are shown in Table 7-18. Total expenditures were $1.4 million with non-residents accounting for $1.3 million or 91.5 percent of total expenditures. Expenditures on hunting accounted for $493,600, expenditures on fishing accounted for $769,000 and non-consumptive activities accounted for $145,400.

Table 7-18. Kodiak NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:	$1.6	$143.8	$145.4
Hunting:			
Big Game	$100.0	$322.4	$422.5
Small Game	$1.0	$14.8	$15.8
Migratory Birds	$1.7	$53.6	$55.3
Total Hunting	$102.7	$390.9	$493.6
Fishing:			
Freshwater	$15.0	$754.0	$769.0
Saltwater	—	—	—
Total Fishing	$15.0	$754.0	$769.0
Total Expenditures	***$119.4***	***$1,288.7***	***$1,408.0***

Table 7-19 summarizes the local economic effects associated with recreation visits. Final demand totaled $1.6 million with associated employment of 20 jobs, $685,800 in employment income and $234,400 in total tax revenue.

Table 7-19. Kodiak NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$111.9	$1,542.9	$1,654.8
Jobs	2	18	20
Job Income	$53.2	$632.6	$685.8
Total Tax Revenue	$16.5	$217.9	$234.4

Table 7-20 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $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 refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 7-20. Kodiak NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Kodiak NWR	$1,943.0	$1,408.0	$483.6	$0.97

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 7-21 shows the area economy. The area population increased by 8.8 percent from 1995 to 2005, compared with a 9.7 percent increase for the state of Alaska and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 18.6 percent from 1995 to 2005, with the state of Alaska showing a 19.0 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 4.6 percent over the 1995-2005 period, while the state of Alaska and the U.S. increased by 5.6 and 13.2 percent respectively.

Table 7-21. Tetlin NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
Area	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Valdez-Cordova Census area	9.9	-3.5%	7.3	8.4%	$34,614	0.4%
Anchorage municipality	275.5	9.3%	197.9	19.0%	$40,670	8.5%
Area Total	**285.4**	**8.8%**	**205.2**	**18.6%**	**$37,642**	**4.6%**
Alaska	663.3	9.7 %	437.0	19.0 %	$35,564	5.6 %
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 7-22 shows the recreation visits for Tetlin NWR. The Refuge had 86,577 recreational visits in 2006. Almost all of the visits were for non-consumptive recreation. The majority of visitors were non-residents (86 percent).

Table 7-22. Tetlin NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	354	62	416
Observation Platforms	1,693	15,238	16,931
Birding	22	194	216
Other Wildlife Observation	3,100	27,900	31,000
Beach /Water Use	160	40	200
Other Recreation	5,532	31,345	36,877
Hunting:			
Big Game	225	40	265
Small Game	62	3	65
Migratory Birds	125	7	132
Fishing:			
Freshwater	428	48	475
Saltwater	0	0	0
Total Visitation	***11,700***	***74,877***	***86,577***

Regional Economic Analysis

The economic area for the Refuge is the Valdez-Cordova Census area and the Anchorage municipality. It is assumed that visitor expenditures occur primarily within these areas. Visitor recreation expenditures for 2006 are shown in Table 7-23. Total expenditures were nearly $3.6 million with non-residents accounting for $3.5 million or 97 percent of total expenditures. Expenditures on non-consumptive activities accounted for 98 percent of all expenditures

Table 7-23. Tetlin NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$0.1	$6.3	$6.4
Other Non-Consumptive	$60.9	$3,456.6	$3,517.5
Total Non-Consumptive	$61.0	$3,462.9	$3,523.9
Hunting:			
Big Game	$8.9	$3.4	$12.3
Small Game	$0.6	$0.5	$1.1
Migratory Birds	$6.2	$1.1	$7.4
Total Hunting	$15.8	$5.0	$20.8
Fishing:			
Freshwater	$14.5	$20.3	$34.8
Saltwater	—	—	—
Total Fishing	$14.5	$20.3	$34.8
Total Expenditures	***$91.3***	***$3,488.2***	***$3,579.5***

Table 7-24 summarizes the local economic effects associated with recreation visits. Final demand totaled $5.1 million with associated employment of 58 jobs, $2.1 million in employment income and $715,800 in total tax revenue.

Table 7-24. Tetlin NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$91.0	$4,994.0	$5,085.0
Jobs	1	57	58
Job Income	$4.3	$2,071.6	$2,075.9
Total Tax Revenue	$13.3	$702.5	$715.8

Table 7-25 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $2.24 means that for every $1 of budget expenditures, $2.24 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 7-25. Tetlin NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Tetlin NWR	$1,934.0	$3,579.5	$754.7	$2.24

California-Nevada Operations

California-Nevada Operations includes California and Nevada. Sample refuges selected within the region include:

Kern NWR (California)
Modoc NWR (California)
Sacramento NWR (California)
San Francisco NWR (California)
San Luis NWR (California)
Stone Lakes NWR (California)

Kern National Wildlife Refuge

Description

Kern National Wildlife Refuge is located in the southern portion of California's San Joaquin Valley, 20 miles west of the city of Delano. Situated on the southern margin of what was once the largest freshwater wetland complex in the western United States, Kern Refuge provides optimum wintering habitat for migratory birds with an emphasis on waterfowl and water birds.

Through restoration and maintenance of native habitat diversity, the refuge also provides suitable habitat for several endangered species as well as preserving a remnant example of the historic valley uplands in the San Joaquin Desert. Approximately 5,500 visitors annually participate in refuge programs ranging from waterfowl hunting to wildlife viewing.

Area Economy

Kern NWR is located in central California. Table 8-1 shows the county economy. The county population increased by 22.1 percent from 1995 to 2005, compared with a 14.1 percent increase for the state of California and a 11.4 percent increase for the U.S. as a whole. County employment increased by 24.7 percent from 1995 to 2005, with the state of California showing a 20.5 percent increase and the U.S. a 17.0 percent increase. County per capita income increased by 6.6 percent over the 1995-2005 period, while the state of California and the U.S. increased by 15.8 and 13.2 percent respectively.

Table 8-1. Kern NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Kern CA	757.0	22.1%	349.9	24.7%	$24,999	6.6%
California	36,154.1	14.1%	20,548.6	20.5%	$36,936	15.8%
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 8-2 shows the recreation visits for Kern NWR. The Refuge had 8,345 visits in 2006. Non-consumptive recreation totaled 4,800 visits and hunting accounted for 3,545 visits. Non-residents accounted for 95 percent of Refuge visits.

Table 8-2. Kern NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	0	0	0
Observation Platforms	0	0	0
Birding	225	4,275	4,500
Other Wildlife Observation	0	0	0
Beach /Water Use	0	0	0
Other Recreation	3	297	300
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	177	3,368	3,545
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	***405***	***7,940***	***8,345***

Regional Economic Analysis

The economic area for the Refuge is Kern County in California. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 8-3. Total expenditures were $632,300 with non-residents accounting for $623,100 or 99 percent of total expenditures. Expenditures on hunting accounted for 70 percent of all expenditures, and non-consumptive activities accounted for 30 percent.

Table 8-3. Kern NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$2.5	$174.7	$177.2
Other Non-Consumptive	$0.1	$12.1	$12.2
Total Non-Consumptive	$2.6	$186.8	$189.4
Hunting:			
Big Game	–	–	–
Small Game	–	–	–
Migratory Birds	$6.6	$436.3	$442.9
Total Hunting	$6.6	$436.3	$442.9
Fishing:			
Freshwater	–	–	–
Saltwater	–	–	–
Total Fishing	–	–	–
Total Expenditures	***$9.2***	***$623.1***	***$632.3***

Table 8-4 summarizes the local economic effects associated with recreation visits. Final demand totaled $967,000 with associated employment of 8 jobs, $284,800 in employment income and $143,700 in total tax revenue.

Table 8-4. Kern NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$13.9	$953.1	$967.0
Jobs	0	8	8
Job Income	$4.2	$280.5	$284.8
Total Tax Revenue	$2.1	$141.6	$143.7

Table 8-5 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $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 refuge visitation to budget expenditures and should not be interpreted as a benefit-cost ratio.

Table 8-5. Kern NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Kern NWR	$874.8	$632.3	$215.2	$0.97

Modoc National Wildlife Refuge

Description

Modoc National Wildlife Refuge is home to more than 250 species of birds and a variety of other wildlife. Located in a high-altitude desert valley on the western edge of the Great Basin in Modoc County, California, the refuge is part of a large complex of mid-altitude wetlands and lakes in northeastern California.

Strategically situated just 60 miles east of the Klamath Basin marshes, the refuge acts as a migration hub and staging area for ducks, geese, and other wetland birds during their spring and fall migrations. The refuge's habitats are also important nesting areas for 76 species of ducks, geese, greater sandhill cranes, and other marsh and upland birds.

Modoc Refuge draws a multitude of birdwatchers during spring and fall migrations. The refuge is a popular site for hunting "honkers" and Great Basin Canada geese, and provides fishing opportunities on Dorris Reservoir.

Area Economy

Modoc NWR is located in northeastern California. Table 8-6 shows the county economy. The county population decreased by 2.6 percent from 1995 to 2005, compared with a 14.1 percent increase for the state of California and a 11.4 percent increase for the U.S. as a whole. County employment increased by 8.9 percent from 1995 to 2005, with the state of California showing a 20.5 percent increase and the U.S. a 17.0 percent increase. County per capita income increased by 8.2 percent over the 1995-2005 period, while the state of California and the U.S. increased by15.8 and 13.2 percent respectively.

Table 8-6. Modoc NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Modoc CA	-2.6%	$18,095	4.7	8.9%	$25,836	8.2%
California	36,154.1	14.1%	20,548.6	20.5%	$36,936	15.8%
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 8-7 shows the recreation visits for Modoc NWR. The Refuge had 15,005 visits in 2006. Non-consumptive recreation accounted for 7,885 visits, fishing 5,500 visits, and hunting, 1,620 visits. Residents accounted for 82 percent of all Refuge visits.

Table 8-7. Modoc NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	0	0	0
Observation Platforms	0	0	0
Birding	2,870	1,230	4,100
Other Wildlife Observation	239	27	265
Beach /Water Use	1,890	210	2,100
Other Recreation	1,278	142	1,420
Hunting:			
Big Game	0	0	0
Small Game	19	13	32
Migratory Birds	1,112	476	1,588
Fishing:			
Freshwater	4,950	550	5,500
Saltwater	0	0	0
Total Visitation	***12,357***	***2,648***	***15,005***

Regional Economic Analysis

The economic area for the Refuge is Modoc County in California. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 8-8. Total expenditures were $314,000 with residents accounting for $187,800 or 60 percent of total expenditures. Expenditures on fishing accounted for 34 percent of all expenditures, followed by hunting and non-consumptive recreation, both at 33 percent.

Table 8-8. Modoc NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$21.4	$33.5	$55.0
Other Non-Consumptive	$33.9	$13.7	$47.6
Total Non-Consumptive	$55.4	$47.2	$102.6
Hunting:			
Big Game	–	–	–
Small Game	$0.3	$1.0	$1.3
Migratory Birds	$41.5	$61.7	$103.2
Total Hunting	$41.9	$62.7	$104.6
Fishing:			
Freshwater	$90.5	$16.3	$106.8
Saltwater	–	–	–
Total Fishing	$90.5	$16.3	$106.8
Total Expenditures	***$187.8***	***$126.2***	***$314.0***

Table 8-9 summarizes the local economic effects associated with recreation visits. Final demand totaled $343,100 with associated employment of 5 jobs, $112,100 in employment income and $56,700 in total tax revenue.

Table 8-9. Modoc NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$207.4	$135.7	$343.1
Jobs	3	1	4
Job Income	$66.0	$46.0	$112.1
Total Tax Revenue	$33.3	$23.4	$56.7

Table 8-10 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $0.65 means that for every $1 of budget expenditures, $0.65 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. Modoc NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Modoc NWR	$953.2	$314.0	$303.2	$0.65

Sacramento National Wildlife Refuge

Description

The Sacramento National Wildlife Refuge is the headquarters for the Sacramento National Wildlife Refuge Complex and is one of six refuges located in the Sacramento Valley of north-central California. The refuge is approximately 90 miles north of Sacramento.

The 10,783-acre refuge consists of about 7,600 acres of managed wetlands, uplands, riparian habitat, and vernal pools. 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 breeding 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 the Sacramento Valley in northcentral California. Table 8-11 shows the area economy. The area population increased by 9.9 percent from 1995 to 2005, compared with a 14.1 percent increase for the state of California and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 17.7 percent from 1995 to 2005, with the state of California showing a 20.5 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 4.3 percent over the 1995-2005 period, while the state of California and the U.S. increased by 15.8 and 13.2 percent respectively.

Table 8-11. Sacramento NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Butte CA	214.2	9.2%	107.2	19.3%	$27,136	16.0%
Glenn CA	27.7	6.3%	12.1	4.4%	$22,561	6.2%
Colusa CA	20.9	18.7%	11.0	15.6%	$25,559	-11.2%
Tehama CA	60.9	11.4%	24.8	18.9%	$22,240	11.1%
Area Total	**323.6**	**9.9%**	**155.2**	**17.7%**	**$24,374**	**4.3%**
California	36,154.1	14.1%	20,548.6	20.5%	$36,936	15.8%
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 8-12 shows the recreation visits for Sacramento NWR. The Refuge had 137,430 visits in 2006. Almost all of the visits were for non-consumptive recreation with 129,257 visits. Non-residents accounted for 127,408 visits, or 93 percent of Refuge visits.

Table 8-12. Sacramento NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	8,735	0	8,735
Observation Platforms	512	50,659	51,171
Birding	694	68,657	69,351
Other Wildlife Observation	0	0	0
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	0	0	0
Small Game	6	574	580
Migratory Birds	76	7,517	7,593
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	***10,022***	***127,408***	***137,430***

Regional Economic Analysis

The economic area for the Refuge is comprised of the following counties in California: Butte, Glenn, Colusa, and Tehama. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2006 are shown in Table 8-13. Total expenditures were $1.8 million with non-residents accounting for 1.7 million or 96 percent of total expenditures. Expenditures on hunting accounted for 57 percent of all expenditures, and non-consumptive activities accounted for 43 percent.

Table 8-13. Sacramento NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	—	—	—
Other Non-Consumptive	$67.2	$690.0	$757.2
Total Non-Consumptive	$67.2	$690.0	$757.2
Hunting:			
Big Game	—	—	—
Small Game	$0.1	$22.2	$22.2
Migratory Birds	$2.8	$973.8	$976.6
Total Hunting	$2.9	$995.9	$998.8
Fishing:			
Freshwater	—	—	—
Saltwater	—	—	—
Total Fishing	—	—	—
Total Expenditures	***$70.1***	***$1,686.0***	***$1,756.0***

Table 8-14 summarizes the local economic effects associated with recreation visits. Final demand totaled $2.4 million with associated employment of 25 jobs, $773,500 in employment income and $391,100 in total tax revenue.

Table 8-14. Sacramento NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$99.6	$2,371.0	$2,470.6
Jobs	1	24	25
Job Income	$31.8	$741.7	$773.5
Total Tax Revenue	$15.8	$375.3	$391.1

Table 8-15 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $2.78 means that for every $1 of budget expenditures, $2.78 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 8-15. Sacramento NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Sacramento NWR	$878.6	$1,756.0	$682.6	$2.78

San Francisco National Wildlife Refuge

Description

The Don Edwards San Francisco Bay National Wildlife Refuge was established in 1972 to preserve and protect critical habitat and associated wildlife, to aid migratory waterfowl, and to provide an opportunity for wildlife-oriented recreation and nature study. The refuge currently encompasses 19,000 acres in San Mateo, Alameda, and Santa Clara counties at the southern end of San Francisco Bay in northern California. It is surrounded by an urban population of over 7 million people, making it the largest urban wildlife refuge in the world. The refuge has an extensive environmental education outreach, with a variety of programs geared toward school children, teacher education, and the general public.

The refuge is comprised of a variety of habitats including mudflats, salt marshes, open water, and salt ponds. This range of habitat supports a large variety of wildlife including five endangered species. The refuge provides major habitat for the endangered California clapper rail and salt- marsh harvest mouse. San Francisco Bay is a key wintering area for diving ducks along the Pacific Flyway; the south bay is used primarily by scaup, surf scoters, and ruddy ducks. The south bay wetlands support hundreds of thousands of shorebirds along with the largest wading-bird rookery in San Francisco Bay.

The refuge has a visitor center at its administrative headquarters in the city of Fremont, and an environmental education center in Alviso on the southeastern edge of the refuge. Boating is a popular activity on the Bay, and a number of launch facilities are adjacent to the refuge. Hiking trails are numerous throughout the refuge. Wildlife observation, fishing, and waterfowl hunting are popular activities.

Area Economy

San Francisco NWR is located at the southern end of San Francisco Bay in northern California. Table 8-16 shows the area economy. The area population increased by 5.6 percent from 1995 to 2005, compared with a 14.1 percent increase for the state of California and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 7.7 percent from 1995 to 2005, with the state of California showing a 20.5 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 25.9 percent over the 1995-2005 period, while the state of California and the U.S. increased by 15.8 and 13.2 percent respectively.

Table 8-16. San Francisco NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Alameda CA	1,451.1	7.8%	896.0	12.8%	$42,956	22.9%
Santa Clara CA	1,705	7.9%	1,117.2	5.0%	$51,112	22.0%
San Mateo CA	701.2	3.2%	462.5	12.8%	$59,213	25.8%
San Francisco CA	741.0	-0.7%	698.6	2.9%	$62,614	31.6%
Area Total	**4,598.4**	**5.6%**	**3,174.3**	**7.7%**	**$53,974**	**25.9%**
California	36,154.1	14.1%	20,548.6	20.5%	$36,936	15.8%
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 8-17 shows the recreation visits for San Francisco NWR. The Refuge had 1,505,410 visits in 2006. Non-consumptive recreation accounted for 1,497,911 visits, hunting 3,800 and fishing 3,700 visits. Residents accounted for 1,279,547 visits, or 85 percent of Refuge visits.

Table 8-17. San Francisco NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	636,612	112,343	748,955
Observation Platforms	0	0	0
Birding	572,951	101,109	674,060
Other Wildlife Observation	63,661	11,234	74,896
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	2,660	1,140	3,800
Fishing:			
Freshwater	0	0	0
Saltwater	3,663	37	3,700
Total Visitation	***1,279,547***	***225,864***	***1,505,410***

Regional Economic Analysis

The economic area for the Refuge is comprised of the following California counties: Alameda, Santa Clara, San Mateo, and San Francisco. It is assumed that visitor expenditures occur primarily within this area. Visitor recreation expenditures for 2006 are shown in Table 8-18. Total expenditures were $16.0 million with residents accounting for 9.7 million or 61 percent of total expenditures. Expenditures on non-consumptive activities accounted for 98percent of all expenditures, followed by hunting and fishing at 2 and less than 1 percent respectively.

Table 8-19 summarizes the local economic effects associated with recreation visits. Final demand totaled $15.1 million with associated employment of 196 jobs, $8.3 million in employment income and $3.8 million in total tax revenue.

Table 8-18. San Francisco NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$4,281.5	$2,754.4	$7,035.9
Other Non-Consumptive	$5,233.0	$3,366.5	$8,599.4
Total Non-Consumptive	$9,514.5	$6,120.8	$15,635.3
Hunting:			
Big Game	—	—	—
Small Game	—	—	—
Migratory Birds	$99.4	$147.7	$247.0
Total Hunting	$99.4	$147.7	$247.0
Fishing:			
Freshwater	—	—	—
Saltwater	$123.9	$4.1	$128.0
Total Fishing	$123.9	$4.1	$128.0
Total Expenditures	***$9,737.7***	***$6,272.7***	***$16,010.4***

Table 8-19. San Francisco NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$15,083.4	$9,712.5	$24,795.9
Jobs	123	73	196
Job Income	$5,071.3	$3,226.2	$8,297.5
Total Tax Revenue	$2,324.3	$1,505.4	$3,829.7

Table 8-20 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $43.55 means that for every $1 of budget expenditures, $43.55 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. San Francisco NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
San Francisco NWR	$763.0	$16,010.4	$17,221.7	$43.55

San Luis National Wildlife Refuge

Description

The San Luis Refuge in the San Joaquin Valley of central California is one of the last remnants of the historically bountiful wintering grounds for migratory waterfowl of the Pacific Flyway. Located in the Bear Creek, Salt Slough, and San Joaquin River floodplain, it hosts a myriad of tree-lined channels and oxbows, wetlands and native grasslands.

Thousands of acres of wetlands, fed by an intricate set of canals, are managed to produce natural food supplies for migratory waterfowl. San Luis also contains the most extensive network of pristine native grasslands, shrubs, and vernal pools that still remain within the Central Valley.

Thousands upon thousands of mallard, pintail, green-winged teal, and ring-necked ducks flock into the managed wetlands; while the colorful, yet secretive, wood duck lives throughout the tree-lined slough channels.

Herons and egrets nest in majestic oaks and willows, then feed on the refuge's abundant frog and crayfish populations. A wide diversity of songbirds, hawks, and owls also use refuge habitat.

Area Economy

San Luis NWR is located in central California. Table 8-21 shows the area economy. The area population increased by 26.6 percent from 1995 to 2005, compared with a 14.1 percent increase for the state of California and a 11.4 percent increase for the U.S. as a whole. Area employment increased by 24.8 percent from 1995 to 2005, with the state of California showing a 20.5 percent increase and the U.S. a 17.0 percent increase. Area per capita income increased by 7.5 percent over the 1995-2005 period, while the state of California and the U.S. increased by 15.8 and 13.2 percent respectively.

Table 8-21. San Luis NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		**Employment**		**Per Capita Income**	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Merced CA	252.2	29.2%	90.8	17.0%	$22,862	10.3%
Stanislaus CA	505.5	23.2%	225.7	26.0%	$26,810	10.2%
San Joaquin CA	664.8	28.4%	286.4	26.5%	$26,071	2.6%
Area Total	**1,422.5**	**26.6%**	**602.9**	**24.8%**	**$25,248**	**7.5%**
California	36,154.1	14.1%	20,548.6	20.5%	$36,936	15.8%
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 8-22 shows the recreation visits for San Luis NWR. The Refuge had 164,900 visits in 2006. Non-consumptive recreation accounted for 150,000 visits, hunting 8,900 visits and fishing 6,000 visits. Non-residents accounted for 70 percent of Refuge visits.

Table 8-22. San Luis NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	15,000	35,000	50,000
Observation Platforms	14,400	33,600	48,000
Birding	14,400	33,600	48,000
Other Wildlife Observation	600	1,400	2,000
Beach /Water Use	600	1,400	2,000
Other Recreation	0	0	0
Hunting:			
Big Game	0	0	0
Small Game	210	490	700
Migratory Birds	2,460	5,740	8,200
Fishing:			
Freshwater	1,800	4,200	6,000
Saltwater	0	0	0
Total Visitation	49,470	115,430	164,900

Regional Economic Analysis

Visitor recreation expenditures for San Luis NWR in 2006 are shown in Table 8-23. Total expenditures were $10.2 million with non-residents accounting for nearly $9.0 million or 88 percent of total expenditures. Expenditures on non-consumptive activities accounted for 94 percent of all expenditures, followed by hunting and fishing at 3 percent each.

Table 8-24 summarizes the local economic effects associated with recreation visits. Final demand totaled $12.2 million with associated employment of 153 jobs, $4.6 million in employment income and $1.8 million in total tax revenue.

Table 8-23. San Luis NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$322.8	$2,746.0	$3,068.8
Other Non-Consumptive	$686.0	$5,835.2	$6,521.2
Total Non-Consumptive	$1,008.8	$8,581.1	$9,590.0
Hunting:			
Big Game	—	—	—
Small Game	$7.6	$75.7	$83.3
Migratory Birds	$122.5	$132.5	$255.1
Total Hunting	$130.2	$208.3	$338.4
Fishing:			
Freshwater	$49.4	$186.3	$235.6
Saltwater	—	—	—
Total Fishing	$49.4	$186.3	$235.6
Total Expenditures	**$1,188.3**	**$8,975.6**	**$10,164.0**

Table 8-24. San Luis NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$1,414.4	$10,827.5	$12,241.9
Jobs	22	131	153
Job Income	$600.7	$3,991.1	$4,591.8
Total Tax Revenue	$223.5	$1,618.6	$1,842.1

Table 8-25 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $12.42 means that for every $1 of budget expenditures, $12.42 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 8-25. San Luis NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
San Luis NWR	$1,283.1	$10,164.0	$5,777.0	$12.42

Stone Lakes National Wildlife Refuge

Description

The Stone Lakes National Wildlife Refuge, located south of Sacramento, California, lies within the Sacramento-San Joaquin delta, the destination of thousands of migrating waterfowl, shorebirds, and other water birds. The refuge was established in 1994 and is one of the few urban refuges that have the potential to attract and educate thousands of visitors in a region that is becoming the new Silicon Valley of California.

Through a number of innovative partnerships, the refuge is protecting scarce natural habitats and agricultural resources in an area threatened by urban sprawl and agricultural changes. Stone Lakes Refuge contains both seasonal and permanent wetlands, riparian forest, and grasslands, as well as some of the last remaining freshwater lakes in the central valley.

These habitats support large populations of migratory water birds, a major rookery for several colonial nesting species such as great blue herons, and a warm water fishery. Several endangered, threatened, and special-status species benefit from these habitats: the valley elderberry longhorn beetle, Swainson's hawk, and greater sandhill crane.

Visitor numbers increase every year; they topped 8,500 in 2001, despite a lack of developed facilities such as a visitor education center and restrooms. Volunteers from the local area dedicate their time on weekends guiding visitors through grasslands and tree-lined waterways to educate the public about the refuge in their backyard.

Area Economy

Stone Lakes NWR is located in northcentral California. Table 8-26 shows the area economy. The county population increased by 19.5 percent from 1995 to 2005, compared with a 14.1 percent increase for the state of California and a 11.4 percent increase for the U.S. as a whole. County employment increased by 27.3 percent from 1995 to 2005, with the state of California showing a 20.5 percent increase and the U.S. a 17.0 percent increase. County per capita income increased by 14.0 percent over the 1995-2005 period, while the state of California and the U.S. increased by15.8 and 13.2 percent respectively.

Table 8-26. Stone Lakes NWR:
Summary of Area Economy, 2005
(Population & Employment in 000's; Per Capita Income in 2006 dollars)

	Population		Employment		Per Capita Income	
County	2005	Percent change 1995-2005	2005	Percent change 1995-2005	2005	Percent change 1995-2005
Sacramento CA	1,363.4	19.5%	801.2	27.3%	$34,014	14.0%
California	36,154.1	14.1%	20,548.6	20.5%	$36,936	15.8%
United States	266,278.4	11.4 %	174,249.6	17.0 %	$34,471	13.2 %

Source: U.S. Department of Commerce 2007.

Activity Levels

Table 8-27 shows the recreation visits for Stone Lakes NWR. The Refuge had 2,652 visits in 2006. Almost all of the visits were for non-consumptive recreation with residents making up 94 percent of Refuge visits.

Table 8-27. Stone Lakes NWR: 2006 Recreation Visits

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Nature Trails	950	50	1,000
Observation Platforms	475	25	500
Birding	950	50	1,000
Other Wildlife Observation	0	0	0
Beach /Water Use	0	0	0
Other Recreation	0	0	0
Hunting:			
Big Game	0	0	0
Small Game	0	0	0
Migratory Birds	122	30	152
Fishing:			
Freshwater	0	0	0
Saltwater	0	0	0
Total Visitation	***2,497***	***155***	***2,652***

Regional Economic Analysis

The economic area for the Refuge is Sacramento County in California. It is assumed that visitor expenditures occur primarily within this county. Visitor recreation expenditures for 2006 are shown in Table 8-28. Total expenditures were $40,200 with residents accounting for $31,200 or 78 percent of total expenditures. Expenditures on non-consumptive activities accounted for 79 percent of all expenditures, followed by hunting at 21 percent.

Table 8-29 summarizes the local economic effects associated with recreation visits. Final demand totaled $61,700 with associated employment of 1 job, $20,300 in employment income and $9,800 in total tax revenue.

Table 8-28. Stone Lakes NWR: Visitor Recreation Expenditures (2006 $,000)

Activity	Residents	Non-Residents	Total
Non-Consumptive:			
Birding	$10.6	$2.0	$12.7
Other Non-Consumptive	$16.0	$3.1	$19.0
Total Non-Consumptive	$26.6	$5.1	$31.7
Hunting:			
Big Game	—	—	—
Small Game	—	—	—
Migratory Birds	$4.5	$3.9	$8.5
Total Hunting	$4.5	$3.9	$8.5
Fishing:			
Freshwater	—	—	—
Saltwater	—	—	—
Total Fishing	—	—	—
Total Expenditures	***$31.2***	***$9.0***	***$40.2***

Table 8-29. Stone Lakes NWR: Local Economic Effects Associated with Recreation Visits (2006 $,000)

	Residents	Non-Residents	Total
Final Demand	$47.6	$14.0	$61.7
Jobs	1	0	1
Job Income	$15.7	$4.6	$20.3
Total Tax Revenue	$7.6	$2.2	$9.8

Table 8-30 shows total economic effects (total recreation expenditures plus net economic value) compared with the refuge budget for 2006. 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 $0.16 means that for every $1 of budget expenditures, $0.16 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 8-30. Stone Lakes NWR: Summary of Local Economic Effects of Recreation Visits (2006 $,000)

	FY 2006 Budget	Expenditures	Economic Value	Total economic effects per $1 budget expenditure
Stone Lakes NWR	$565.5	$40.2	$48.2	$0.16

An Overview of Sample Refuges

Characteristics of Sample Refuges

Unlike previous reports, 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 slightly underrepresented.

Figure 9-1. Percent of National Wildlife Refuges by Recreational Visitor Days

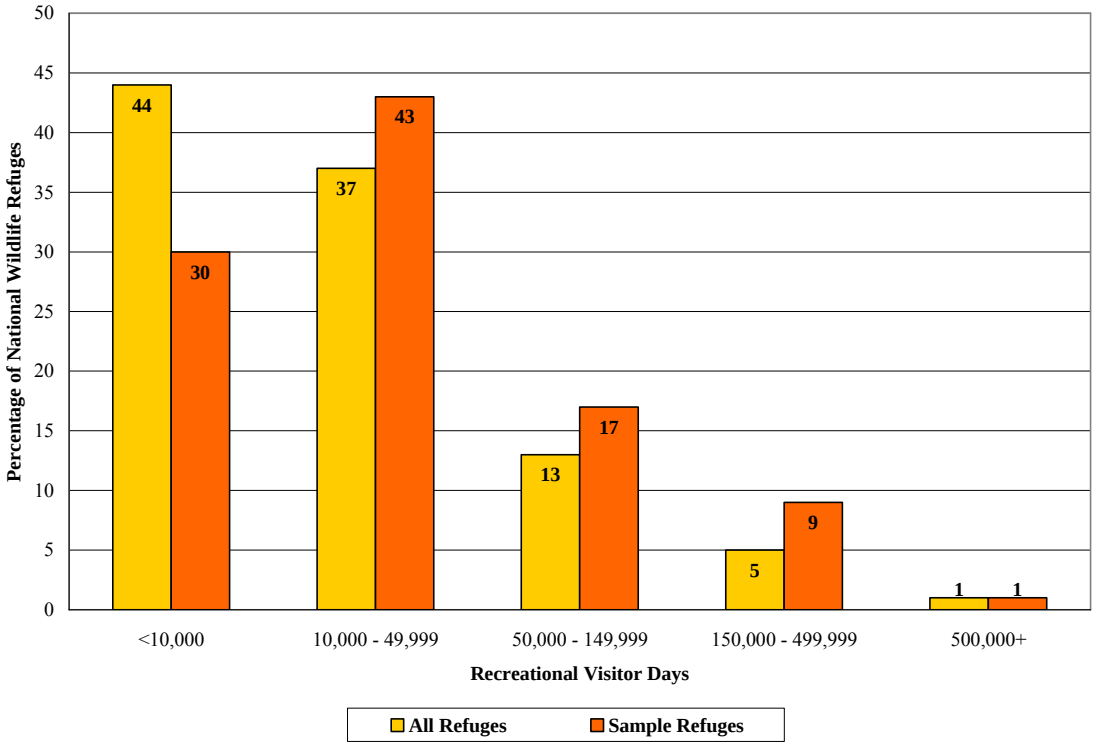
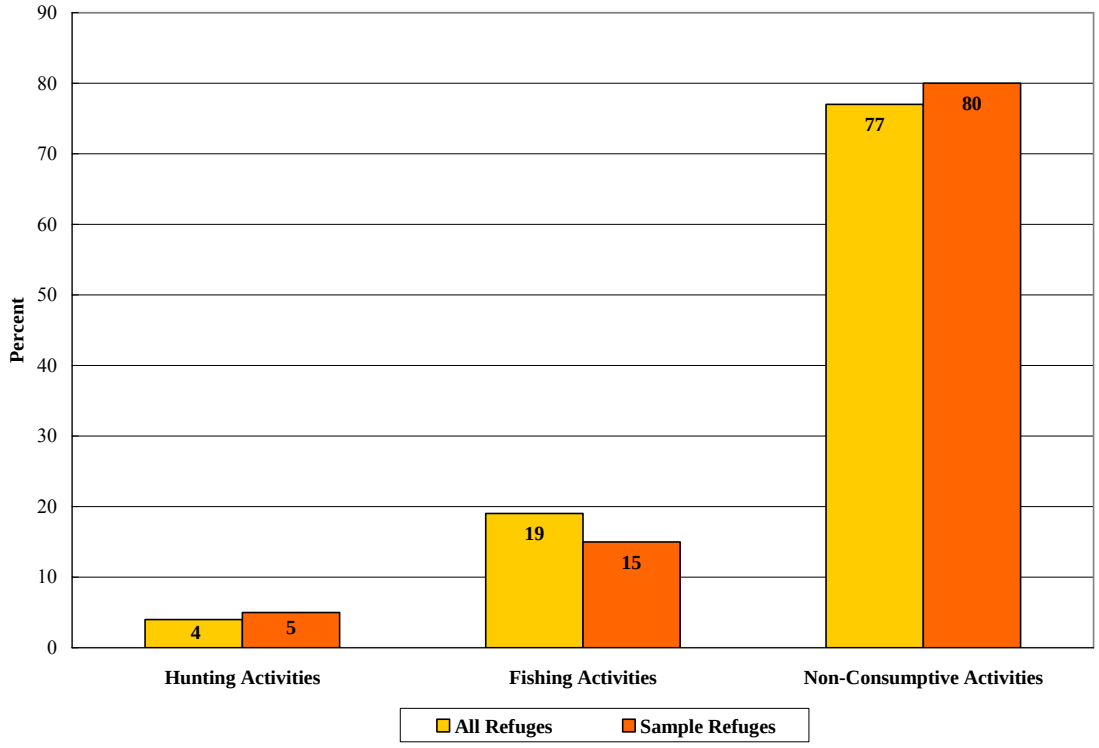


Figure 9-2 illustrates the percentage of RVDs across activities. The majority of RVDs are attributable to non-consumptive activities, followed by fishing activities and hunting activities. Again, the sample represents the refuge population well when comparing averages.

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 region. 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 87 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.

Figure 9-3. Distribution of Expenditures by Resident and Non-Resident Visitors

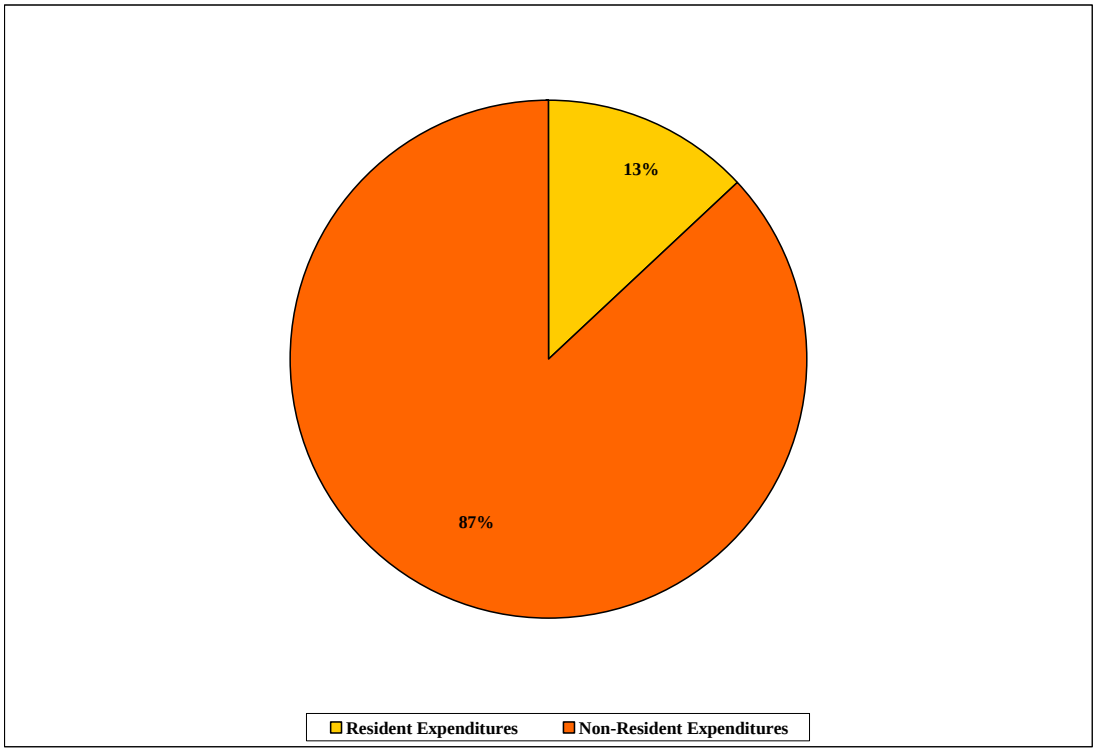


Table 9-1 shows the sample refuges with the highest final demand generated by recreational visitation. Compared to all the sample refuges, Chincoteague NWR had the highest recreational visitation (7.5 million visits) and the highest final demand ($315.4 million). A close look at Table 8-1 shows how differences in refuge use result in different economic results. Time spent, activities enjoyed, and residence of visitors determine refuge recreation economics. Bombay Hook NWR receives about 271,000 recreation visits annually compared with White River NWR receiving about 523,000 recreation visits. Although White River NWR receives about 100 percent more visits, the final demand for Bombay Hook NWR is 55 percent higher than White River NWR. This difference is because visitors to Bombay Hook NWR spend more time on average than visitors to White River 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
Chincoteague NWR	7,485,286	$315,434.6	$94,856.7	3,766
Kenai NWR	659,525	$59,025.4	$24,257.3	734
Alaska Maritime NWR	110,750	$25,886.7	$10,808.1	298
San Francisco Bay NWR	1,505,410	$24,795.9	$8,297.5	196
St. Marks NWR	846,121	$23,867.9	$9,320.9	346
Bombay Hook NWR	270,860	$20,212.5	$6,456.8	198
Wheeler NWR	590,743	$16,333.8	$5,171.0	202
Charles M. Russell NWR	233,081	$14,400.9	$4,235.8	232
White River NWR	523,000	$13,045.9	$4,136.5	218
San Luis NWR	164,900	$12,241.9	$4,591.8	153

An Overview of Sample Refuges: Economic Impacts of Birding

According to the 2006 National Survey of Fishing, Hunting and Wildlife-Associated Recreation published by the Fish and Wildlife Service, about 48 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 is up by 5 percent as a recreational pursuit since 2001.

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.

Nationally, 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 2006, birding visits to the 80 sample refuges were over 3.6 million, averaging 3.3 hours per visit (Table 10-1). Birding also has considerable expenditures associated with refuge visitation (Table 10-2). Due to the lack of specific birding data for all refuges, birding impacts are not extrapolated for a nationwide impact.

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 10-1 shows sample refuges with over 50,000 birding visits in 2006.

Table 10-1. Birding Visitation on Sample Refuges: 50,000 or More Visits in FY 2006

National Wildlife Refuge	2006 FY Visits
Chincoteague NWR	1,047,052
Don Edwards San Francisco Bay NWR	674,060
St. Marks NWR	139,512
Bombay Hook NWR	127,000
Wheeler NWR	126,710
Parker River NWR	120,000
DeSoto NWR	103,849
Ridgefield NWR	100,200
Minnesota Valley NWR	90,000
Alaska Maritime NWR	89,000
Santa Ana NWR	80,000
Quivira NWR	80,000
Sacramento NWR	69,351
Edwin B. Forsythe NWR	69,000
Ottawa NWR	68,061
Muscatatuck NWR	54,000
White River NWR	50,000
Total Birding Visits for All Sample Refuges	***3,662,215***

Table 10-2 shows those sample refuges with $1 million or more expenditures associated with birding visits on the sample refuges in 2006.

Table 10-2. Birding Expenditures on Sample Refuges: $1 million or more in FY 2006 (2006$, '000's)

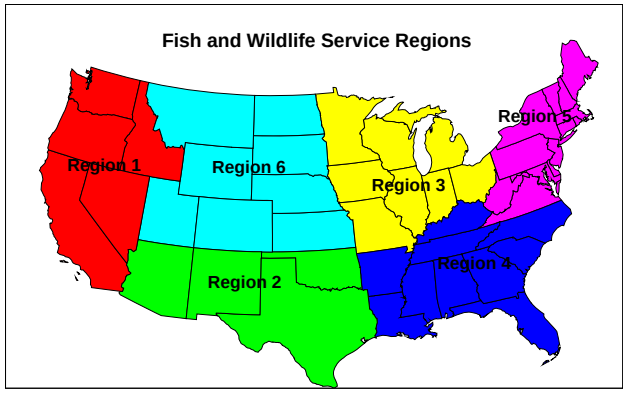
National Wildlife Refuge	2006 FY Expenditures
Alaska Maritime NWR	$21,074.2
Chincoteague NWR	$20,271.0
Bombay Hook NWR	$7,417.7
Don Edwards San Francisco Bay NWR	$7,035.9
St. Marks NWR	$5,636.8
Santa Ana NWR	$3,086.8
San Luis NWR	$3,068.8
Wheeler NWR	$2,773.9
Muscatatuck NWR	$2,579.6
Parker River NWR	$2,003.6
Ottawa NWR	$1,969.9
Quivira NWR	$1,863.2
White River NWR	$1,578.4
Eastern Neck NWR	$1,449.0
Ridgefield NWR	$1,422.3
Bear River Migratory Bird Refuge	$1,188.9
Kenai NWR	$1,075.5
DeSoto NWR	$1,050.4
Total Birding Expenditures for All Sample Refuges	***$96,760.6***

A National View

Aggregate National Economic Effects for the Lower 48 States

Eighty refuges (including wetland management districts) were studied in detail for this report. Sample refuges with more than 1,500 visitors and located within the lower 48 states were used to estimate the local economic effects of refuge visitation nationwide[2]. Consequently, the national estimates discussed in this section reflect refuge visitation and economic impacts ***only*** for the lower 48 states and for refuges with more than 1,500 visitors. Total visitation numbers for the refuge system as a whole for 2006 are higher than the visitation numbers reported in this section. 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 somewhat more reliable.

As shown in Table 11-1, final demand associated with recreation visits totaled nearly $1.7 billion. This is the total monetary value of economic activity generated by recreational refuge visitation. In turn, this final demand generated $542.8 million in job income and 26,798 jobs.



Region 4 had the most visitors in FY 2006. 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 272.6 million recreation visits in 2006. In 2006, the Bureau of Land Management lands received over 55 million visitors for nearly 70 million visitor days (U.S. Department of the Interior 2007). 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.

Net Economic Value

As explained in the Introduction, refuge visitors derive more benefits from their recreation than they pay for it. Surveys can measure the additional benefit by asking how much the costs of recreating would need to rise before the visitor would decide not to participate in the activity. These amounts have been estimated for the nation. Multiplying the national value by the number of recreational visitor days spent pursuing that activity on a refuge yields an estimate for the net economic value (or consumer surplus) of the activity. These values are summed by Fish and Wildlife Service region in Table 11-2.

Consumer surplus from non-consumptive recreation dominates every region. Furthermore, consumer surplus from consumptive recreation (hunting and fishing) does not exceed non-consumptive consumer surplus in any region. While fishing consumer surplus has the greatest value per trip ($50.50), fishing consumer surplus comprises only 17 percent of the consumer surplus values from national refuge visitation. Regional variation is caused by differing levels of activity.

2 Refer to the Introduction and Appendix 1 for further information.

Table 11-1. National Significance of Refuge Visitation by FWS Region

Fish and Wildlife Service Region	Visitors FY 2006	Final Demand ($2006 ,000)	Job Income ($2006 ,000)	Jobs
1	3,757,019	$136,945	$46,093	2,533
2	4,923,719	$237,587	$77,785	3,778
3	6,998,215	$258,818	$84,568	4,473
4	9,465,574	$426,688	$138,891	7,381
5	5,833,440	$480,182	$147,911	6,308
6	2,187,210	$82,442	$26,187	1,387
8	1,626,949	$63,428	$21,338	938
Total	**34,792,126**	**$1,686,089**	**$542,773**	**26,798**

Table 11-2. Net Economic Values* from National Wildlife Refuge Visitation by FWS Region

Fish and Wildlife Service Region	Visitors FY 2006	Non-Consumptive ($2006 ,000)	Hunting ($2006 ,000)	Fishing ($2006 ,000)	Total ($2006 ,000)
1	3,757,019	$61,695	$2,303	$5,565	$69,563
2	4,923,719	$105,784	$2,123	$17,323	$125,230
3	6,998,215	$62,006	$8,825	$28,238	$99,068
4	9,465,574	$166,017	$18,755	$76,284	$261,055
5	5,833,440	$206,514	$2,330	$15,765	$224,608
6	2,187,210	$30,539	$9,907	$5,998	$46,444
8	1,626,949	$31,920	$1,304	$1,142	$34,366
Total	**34,792,126**	**$664,473**	**$45,547**	**$150,314**	**$860,335**

***** Due to data limitations, regional consumer surplus values were unavailable. Therefore, national estimates were substituted.

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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 for four categories of expenditures (food, lodging, transportation, and other).

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 80 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 2004 IMPLAN data set was used for the analysis. All monetary impacts were adjusted to 2006 dollars.

3. Expenditure Data

Per-person per-day expenditure information is based on the 2006 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 7. 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	sporting goods	40%
..	tobacco	1%
..	alcohol	1%
..	shoes	8%
..	clothing: women	8%
..	clothing: men	8%
..	personal/misc.	8%
..	toilet articles	8%
..	telephone	6%
..	postage	6%
..	film development	6%

[3]Percentage of spending in NSFHWR category allocated to specified IMPLAN activity or sector.

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 2006 data are used in this report.

(c) For the economic impact IMPLAN analysis, residents are defined as living within a 30-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 80 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.

(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 80 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

(a) 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 71 of the 80 case studies can be treated as data points. (To remain consistent with past studies, refuges with less than 1,500 visitors or located outside the continental United States were not included in this model. Therefore, the number of data points is slightly less than the number of refuges in the detailed sample.) National estimates were derived using average ratios from the sample refuges. 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 then applied to estimate the economic impact of national wildlife refuges nationwide. This methodology is not the same as that used in earlier reports.

Several adjustments were made to the data to ensure consistency. The sample refuges' recreational visitation ranged from 522 to 6.3 million. Applying the ratios derived from this sample to refuges with very low visitation yielded very high estimates of final demand. To avoid adding these into the national results, all refuges with fewer than 1,500 visits were deleted from the calculations. This eliminated about 135 refuges but relatively few visits. Refuges in Alaska, Hawaii, and the U.S. Territories were also 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.

(b) Consumer Surplus - Consumer surplus (net economic value) was estimated for the sample refuges by multiplying recreational visitor days by the national consumer surplus value. Essentially the same process was followed for the refuges outside of the sample. Outside of the sample, detailed information was not available on the amount of time spent in each activity on the refuge. Recreational visits were adjusted to recreational visitor days using the average length of time such visitors stayed at the sample refuges, depending on the type of activity.

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. Region 1 and CNO Recreation Expenditures: Per Person Per Day, by Recreation Activity (2006 $)												
	Non-Consumptive		Big Game Hunting		Small Game Hunting		Migratory Waterfowl Hunting		Freshwater Fishing		Saltwater Fishing	
Sector	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident
Lodging	7.84	31.34	2.39	10.14	4.89	55.46	2.19	10.99	3.05	10.75	4.66	41.59
Food/drink	10.09	33.24	14.08	19.95	10.99	19.49	14.40	43.21	10.39	16.11	16.54	53.67
Other Transportation	7.97	28.45	17.34	22.14	15.95	16.43	21.83	92.49	11.65	14.60	10.90	31.25
Air Transportation	1.30	3.09	0.05	7.14	0.21	56.52	0.00	10.28	0.48	7.29	0.03	34.04
Other	2.69	12.85	3.02	25.75	4.29	6.62	11.39	15.76	11.01	10.38	35.51	62.93
Total	29.89	108.97	36.88	85.11	36.33	154.52	49.81	172.72	36.57	59.13	67.64	223.48

For the purpose of this analysis, Region 1 includes California, Idaho, Nevada, Oregon, and Washington.

Table 2b. Region 2 Recreation Expenditures: Per Person Per Day, by Recreation Activity (2006 $)												
	Non-Consumptive		Big Game Hunting		Small Game Hunting		Migratory Waterfowl Hunting		Freshwater Fishing		Saltwater Fishing	
Sector	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident
Lodging	3.84	42.02	4.67	23.56	4.15	6.71	2.63	23.88	1.86	12.79	2.94	5.51
Food/drink	8.55	32.16	14.26	27.86	7.77	16.75	11.68	19.13	8.17	17.51	8.00	12.31
Other Transportation	7.06	32.56	16.82	28.59	13.91	23.48	21.10	14.80	10.10	20.40	12.48	13.19
Air Transportation	0.20	2.77	1.10	12.39	0.64	5.36	0.88	5.14	0.07	1.64	0.06	15.31
Other	3.32	2.26	11.73	80.58	2.40	6.13	7.85	10.45	13.12	25.55	15.12	11.88
Total	22.97	111.77	48.57	172.98	28.88	58.44	44.15	73.40	33.32	77.89	38.59	58.20

Region 2 includes Arizona, New Mexico, Oklahoma and Texas.

Table 2c. Region 3 Recreation Expenditures: Per Person Per Day, by Recreation Activity (2006 $)												
	Non-Consumptive		Big Game Hunting		Small Game Hunting		Migratory Waterfowl Hunting		Freshwater Fishing		Saltwater Fishing	
Sector	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident
Lodging	3.56	12.29	1.94	9.61	0.62	10.06	0.36	11.39	2.21	15.68	--	--
Food/drink	6.61	35.35	8.01	18.87	6.11	16.98	4.54	15.76	5.90	17.28	--	--
Other Transportation	5.87	23.49	8.57	19.69	6.85	27.87	7.43	14.77	6.93	19.13	--	--
Air Transportation	0.03	0.67	0.00	3.42	0.00	11.43	0.00	2.15	0.00	3.34	--	--
Other	1.15	3.52	1.54	9.18	1.06	11.93	8.26	53.96	6.34	11.26	--	--
Total	17.23	75.31	20.05	60.77	14.64	78.27	20.59	98.03	21.38	66.69	--	--

Region 3 includes Iowa, Illinois, Indiana, Minnesota, Missouri, Michigan, Ohio and Wisconsin.

Table 2d. Region 4 Recreation Expenditures: Per Person Per Day, by Recreation Activity (2006 $)												
	Non-Consumptive		Big Game Hunting		Small Game Hunting		Migratory Waterfowl Hunting		Freshwater Fishing		Saltwater Fishing	
Sector	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident
Lodging	3.66	29.08	0.95	4.44	0.84	7.57	1.11	11.25	1.19	11.87	4.51	41.81
Food/drink	5.89	28.03	7.52	15.77	4.13	13.80	8.93	16.81	4.85	14.46	9.83	23.91
Other Transportation	5.34	19.71	7.79	17.77	5.14	23.95	8.41	15.12	5.11	18.07	6.65	25.85
Air Transportation	0.14	3.08	0.03	0.01	0.00	2.94	0.00	0.57	0.08	2.99	0.27	11.40
Other	1.85	4.24	4.59	14.40	0.95	41.98	4.27	7.50	7.86	10.93	26.69	42.41
Total	16.88	84.14	20.88	52.38	11.05	90.23	22.72	51.26	19.08	58.31	47.95	145.37

Region 4 includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Puerto Rico, South Carolina, and Tennessee.

Table 2e. Region 5 Recreation Expenditures: Per Person Per Day, by Recreation Activity (2006 $)												
	Non-Consumptive		Big Game Hunting		Small Game Hunting		Migratory Waterfowl Hunting		Freshwater Fishing		Saltwater Fishing	
Sector	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident
Lodging	2.95	24.24	1.08	6.79	0.67	9.95	3.08	23.04	1.19	11.95	1.77	11.37
Food/drink	6.26	36.48	6.15	16.61	4.17	24.86	8.90	24.72	4.69	13.23	9.01	16.94
Other Transportation	6.62	21.23	6.44	17.47	4.28	21.42	10.42	23.32	5.14	15.57	6.40	16.24
Air Transportation	0.36	1.05	0.00	0.99	0.00	21.11	0.00	1.19	0.01	1.64	0.24	0.76
Other	1.47	1.83	1.29	6.95	1.21	16.45	6.46	35.21	6.34	10.95	36.32	29.97
Total	17.65	84.83	14.97	48.81	10.34	93.80	28.87	107.48	17.38	53.33	53.73	75.28

Region 5 includes Connecticut, District of Columbia, Delaware, Massachusetts, Maryland, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Virginia, Vermont, and West Virginia.

Table 2f. Region 6 Recreation Expenditures: Per Person Per Day, by Recreation Activity (2006 $)												
	Non-Consumptive		Big Game Hunting		Small Game Hunting		Migratory Waterfowl Hunting		Freshwater Fishing		Saltwater Fishing	
Sector	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident
Lodging	3.95	50.49	1.99	29.43	1.96	33.34	0.37	9.49	1.60	19.25	--	--
Food/drink	7.91	48.90	12.24	31.18	7.20	39.89	9.48	22.80	9.00	28.06	--	--
Other Transportation	8.70	30.62	16.21	40.41	13.79	40.67	13.79	29.73	11.20	35.01	--	--
Air Transportation	0.13	5.93	0.13	11.39	0.00	12.24	0.00	3.11	0.00	11.11	--	--
Other	1.50	4.52	1.94	77.97	1.08	30.73	2.16	2.49	7.44	18.59	--	--
Total	22.20	140.47	32.52	190.37	24.03	156.86	25.79	67.62	29.24	112.01	--	--

Region 6 includes Colorado, Kansas, Montana, North Dakota, Nebraska, South Dakota, Utah, and Wyoming.

Table 2g. Region 7 Recreation Expenditures: Per Person Per Day, by Recreation Activity (2006 $)												
	Non-Consumptive		Big Game Hunting		Small Game Hunting		Migratory Waterfowl Hunting		Freshwater Fishing		Saltwater Fishing	
Sector	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident	Resident	Non-Resident
Lodging	5.77	54.55	0.40	10.14	0.25	55.46	2.19	10.99	1.61	74.84	1.24	59.79
Food/drink	8.38	52.68	10.74	19.95	3.24	19.49	14.40	43.21	10.57	61.95	12.48	48.52
Other Transportation	8.21	16.18	15.14	22.14	5.42	16.43	21.83	92.49	11.18	44.49	6.59	29.86
Air Transportation	0.53	118.66	6.53	7.14	0.00	56.52	0.00	10.28	1.72	120.32	0.61	75.99
Other	3.79	18.07	6.80	25.75	1.06	6.62	11.39	15.76	8.90	124.88	37.75	87.44
Total	26.67	260.14	39.61	85.11	9.98	154.52	49.81	172.72	33.98	426.48	58.68	301.59

Region 7 includes Alaska.

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
Alaska Maritime	7	110,750	$25,886.7	$10,808.1	298
Alaska Peninsula	7	3,315	$396.1	$164.9	5
Assabet River	5	49,331	$681.5	$201.1	10
Balcones Canyonlands	2	27,551	$555.8	$213.3	7
Bandon Marsh	1	4,050	$45.6	$17.9	1
Bear River MBR	6	42,209	$1,962.4	$624.9	31
Benton Lake	6	9,100	$213.3	$61.0	3
Big Muddy	3	5,275	$95.2	$39.7	1
Bill Williams River	2	72,500	$2,274.9	$872.3	38
Bitter Lake	2	71,465	$1,438.9	$450.2	23
Bombay Hook	5	270,860	$20,212.5	$6,456.8	198
Browns Park	6	5,360	$681.5	$201.1	10
Buffalo Lake	2	8,624	$154.9	$61.1	3
Camas	1	6,565	$110.8	$91.9	2
Charles M. Russell	6	233,081	$14,400.9	$4,235.8	232
Chincoteague	5	7,485,286	$315,434.6	$94,856.7	3,766
Cibola	2	2,000	$215.6	$85.0	3
Cross Creeks	4	37,981	$643.1	$276.7	12
Deer Flat	1	118,131	$2,028.3	$852.5	33
DeSoto NWR	3	283,781	$2,566.6	$999.3	52
Don Edwards San Francisco Bay	8	1,505,410	$24,795.9	$8,297.5	196
Dungeness	1	89,020	$2,325.1	$924.8	38
Eastern Neck	5	103,946	$3,841.0	$1,177.2	44
Eastern Shore Of Virginia NWR	5	29,147	$385.9	$125.7	5
Edwin B. Forsythe	5	195,821	$4,449.9	$1,448.2	41
Fergus Falls WMD	3	93,298	$1,448.2	$571.5	26
Hakalau Forest	1	1,323	$59.4	$22.0	1
Huron WMD	6	26,800	$1,273.9	$372.5	19
James River	5	776	$26.2	$7.2	0
John Heinz	5	106,491	$1,694.1	$536.3	14
Kenai	7	659,525	$59,025.4	$24,257.3	734
Kern	8	8,345	$967.0	$284.8	8
Kilauea Point	1	986,088	$10,405.0	$4,138.5	142
Kodiak	7	10,468	$1,654.8	$685.8	20
Kofa	2	302,680	$8,715.9	$3,585.9	158
Leopold WMD	3	37,050	$652.7	$259.5	10
Madison WMD	6	127,469	$6,907.9	$2,082.3	80
Malheur	1	63,000	$4,372.7	$1,745.2	103
Mason Neck	5	50,296	$775.1	$279.1	7
Maxwell	2	3,660	$68.3	$27.5	2
McNary	1	58,210	$1,236.9	$518.0	22

Table 3a continued

Refuge Name	Region	Total Recreational Visitation	Total Final Demand $(,000)	Total Employment Income $(,000)	Total Jobs
Minnesota Valley	3	257,250	$1,475.7	$629.5	21
Modoc	8	15,005	$343.1	$112.1	4
Monomoy	5	31,660	$635.7	$213.7	6
Monte Vista	6	5,750	$80.4	$25.9	1
Muscatatuck	3	110,000	$3,108.1	$1,287.0	48
Neal Smith	3	186,131	$2,460.5	$982.2	36
Ninigret	5	108,959	$1,296.2	$425.6	15
Nisqually	1	149,515	$2,841.4	$1,137.9	40
Noxubee	4	143,255	$2,613.9	$978.1	59
Ottawa	3	177,529	$5,008.3	$1,468.4	13
Parker River	5	457,966	$11,391.4	$3,783.8	107
Patuxent Research	5	131,402	$2,085.6	$646.3	20
Pocosin Lakes	4	82,800	$903.8	$256.0	14
Presquile	5	1,079	$17.8	$5.5	0
Quivira	6	156,300	$5,283.6	$1,603.3	74
Rainwater Basin WMD	6	62,000	$1,081.0	$304.9	14
Ridgefield	1	178,115	$2,881.4	$1,133.4	36
Sacramento	8	147,430	$2,470.6	$773.5	25
San Luis	8	164,900	$12,241.9	$4,591.8	153
Santa Ana	2	257,500	$5,598.4	$2,003.6	82
Sequoyah	2	88,020	$2,428.9	$946.0	47
Sherburne	3	91,426	$1,083.1	$493.7	19
Shiawassee	3	117,520	$3,108.1	$1,287.0	48
St. Croix WMD	3	16,221	$282.5	$123.5	6
St. Marks	4	846,121	$23,867.9	$9,320.9	346
Stewart B. McKinney	5	21,710	$294.7	$97.1	2
Stone Lakes	8	2,652	$61.7	$20.3	1
Tamarac	3	79,954	$1,571.5	$491.2	23
Tensas River	4	78,800	$3,565.0	$1,023.8	50
Tetlin	7	86,577	$5,085.0	$2,075.9	58
Tishomingo	2	205,944	$5,165.5	$1,562.2	110
Trempealeau	3	100,597	$1,037.1	$320.9	16
Turnbull	1	66,000	$1,266.1	$500.4	18
Umatilla	1	75,748	$1,803.7	$769.2	29
Waccamaw	4	3,190	$31.2	$10.1	0
Washita	2	58,582	$965.0	$374.4	20
Wheeler	4	590,743	$16,333.8	$5,171.0	202
White River	4	523,000	$13,045.9	$4,136.5	218
William L. Finley	1	120,933	$1,460.1	$488.7	22