

# NARRAGANSETT BAY WATERSHED ECONOMY

## The ebb and flow of natural capital



### Wildlife Viewing Overview

Wildlife viewing is an activity enjoyed by residents and visitors alike in the Narragansett Bay watershed (NBW). This recreational activity includes observing, photographing, and feeding wildlife in parks, nature preserves, wetlands, and other locations where wildlife is present. Wildlife viewing takes place both around the home and away from home, and many different types of wildlife are the focus of recreational wildlife viewing. Water fowl, birds of prey, and songbirds are the most popular animals to be observed, photographed, or fed, while land mammals, fish, insects, spiders, and reptiles are also popular (Figure 1).<sup>1</sup>

Recreational wildlife viewing has increased in popularity within Rhode Island (RI) and Massachusetts (MA) since 2001. More than 172,000 wildlife viewers within the NBW spent over two million days and \$400 million (in 2016 dollars) on wildlife viewing related expenditures such as food, lodging, transportation, and equipment.<sup>2</sup> This activity has potential for future growth as it is an important part of ecotourism, a growing sector worldwide.<sup>3</sup> This is especially the case as the baby boomer generation grows older and has more free time to spend pursuing recreational activities, as wildlife viewing and birdwatching are popular outdoor activities for this demographic.<sup>4</sup>

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**Figure 1: Deer Caught on Wildlife Camera, East Greenwich, RI**

Source: Dawn and Joseph Giroux

## History

Wildlife watching is a revered recreational activity, and public concern for protecting the wildlife we delight in has existed for over a century. In 1903, President Theodore Roosevelt established the first National Wildlife Refuge. This set in motion a promise to preserve America’s wildlife heritage for future generations to enjoy. Individuals in the NBW were taking initiative even before this movement, forming the Audubon Society of RI in 1897 to protect birds, other wildlife, and their habitats. Less than two decades later, the first MA Audubon wildlife sanctuary opened in 1916 for bird protection.<sup>5</sup>

Since Roosevelt’s time, many organizations have been formed that act in the name of wildlife protection. These organizations aim to preserve the wildlife that we appreciate viewing. For example, the National Wildlife Refuge System has grown to include more than 94 million acres on over 540 refuges throughout the U.S., the Mass Audubon protects over 36,000 acres, and the Audubon Society of RI maintains and manages over 9,000 acres.<sup>6</sup>

## Data Sources and Limitations

Estimates of participation rates and expenditures plus the economic impact of wildlife viewing within the NBW are presented here. These data are derived from the U.S. Fish and Wildlife Service (USFWS) 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.<sup>i</sup> This report only focuses on wildlife viewing that occurs within RI and MA state borders, disregarding out-of-state wildlife viewing carried out by RI and MA residents. Data for RI were also obtained from a 2017 report by Tom Sproul, *The Economic Impact of Rhode Island State Parks*.

To estimate the recreational wildlife viewing activity within the NBW using published data at the state level, state figures were adjusted by the share of the state’s population in the watershed in 2010. This equates to 88.8% of the state population in RI and 15% in MA (for maps of the area and population of the NBW, please reference the “Geography” section). This approach assumes that participation rates for wildlife viewing are the same in both watershed and non-watershed areas. For example, the USFWS estimate of 282,000 wildlife viewers in RI translates into nearly 73,000 wildlife viewers in the RI portion of the watershed.

For additional information on the methodologies used in this report, please reference the “Methodology” section.

## Current Status and Trends

Today, wildlife viewing is a popular recreational activity in the NBW for a wide variety of individuals. Based on previously stated assumptions, in 2011 there were over 172,000 individuals who viewed wildlife away-from-home in the watershed (Table 1). These individuals took over one

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<sup>i</sup> The USFWS survey focuses on those at least 16 years old.

million trips at least one mile from home for the primary purpose of observing, photographing, or feeding wildlife. They also spent almost nearly three million days viewing wildlife.<sup>7</sup>

**Table 1: Estimated Away-from-Home Wildlife Viewing Participation in the NBW (2011)**

	Number of Wildlife Viewers (1000s)	Number of Trips (1000s)	Number of Viewing Days (1000s)	Average Number of Viewing Days
<b>RI</b>	72.8	807	1,093	15
<b>MA</b>	99.3	677	1,582	16
<b>Watershed</b>	172.1	1,484	2,675	15.5

Source: 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, 2013

Note: Scaled by ratio of state population in the watershed: RI = 88.8%, MA = 15%

According to the survey, more than half of the wildlife viewers are tourists from out of state, bringing in economic value to the region through associated tourism spending (Table 2). Within the watershed, there are over 82,000 individuals in RI and MA who view wildlife away from home in their own state. These individuals take over one million trips and spend nearly two million days every year viewing wildlife. The residents who engage in wildlife viewing away from home represent 48% of all away-from-home wildlife viewers in the watershed, with the remaining 52% being out-of-state tourists.<sup>ii</sup>

**Table 2: Estimated Residential Away-from-Home Wildlife Viewing Participation in the NBW (2011)**

	Number of Wildlife Viewers (1000s)	Number of Trips (1000s)	Number of Viewing Days (1000s)	Average Number of Viewing Days
<b>RI</b>	31.1	592	724	23
<b>MA</b>	51.3	525	1,170	23
<b>Watershed</b>	82.4	1,117	1,894	23

Note: Scaled by ratio of state population in the watershed: RI = 88.8%, MA = 15%

Source: 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, 2013

Although a substantial number, away-from-home wildlife viewing is a small component of the total wildlife viewing activities; much of the wildlife viewing is done within one mile of residents' homes (Table 3). In 2011 in the NBW, there were nearly six times the amount of residential around-the-home wildlife viewers than there were residential away-from-home wildlife viewers, with 82,400 away-from-home compared to 454,400 around-the-home. When comparing total NBW wildlife viewing participation—residents and tourists—around-the-home is still over twice as popular as away-from-home. In 2011, there were 172,100 away-from-home wildlife viewers in the NBW compared to 454,400 around-the-home wildlife viewers. Despite the large magnitude of around-the-

<sup>ii</sup> We do not know the number of non-residents who are RI or MA residents viewing wildlife across state lines, but still within the watershed.

home wildlife viewers, this report focuses on away-from-home wildlife viewers. This is because away-from-home viewers take trips for the specific purpose of viewing wildlife.

**Table 3: Estimated Total Wildlife Viewing Participation in the NBW (2011)**

	<b>Number of Wildlife Viewers, Around-the-Home (1000s)</b>	<b>Number of Wildlife Viewers, Away-from-Home (1000s)</b>
<b>RI</b>	230.9	72.8
<b>MA</b>	223.5	99.3
<b>Watershed</b>	454.4	172.1

*Note:* Scaled by ratio of state population in the watershed: RI = 88.8%, MA = 15%

Source: 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, 2013

Data are also available that allow one to identify characteristics of those that are viewing wildlife recreationally (Table 4). The majority are from urban areas, are female, between the ages of 45 and 64, and are white. Many wildlife watchers are also earning well above average incomes, which is partly a reflection of higher than average education levels.<sup>8</sup>

**Table 4: Characteristics of Residential Away-from-Home Wildlife Viewers in RI and MA (2011)**

	<b>RI</b>	<b>MA</b>
From urban area	89%	86%
Females	55%	57%
Between ages 45-64	53%	54%
White	91%	96%
4 years or more of college	61%	66%
Annual income above \$100,000	33%*	42%*
Average number of days of activity per year	23	23

\*Based on a sample size of 10–29

Source: 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, 2013

Wildlife viewing also contributes to the economy, although the impact is not as large as that of recreational fishing and hunting. Many participants contribute to the NBW economy by purchasing equipment to view, photograph, or feed wildlife, or traveling far enough to areas where lodging and food become necessary.

Furthermore, a study done by Tom Sproul for the University of Rhode Island found that in 2016 there were nearly 9.5 million visitors to Rhode Island state parks, beaches, bikeways, and campgrounds, many of which fall within the boundaries of the NBW. While all of these areas are potential wildlife viewing destinations, it is difficult to estimate the portion of economic output solely related to wildlife viewing with this data; rather, these figures provide an overview of the economic importance of wildlife viewing venues in the NBW. In 2016, out of the 9.5 million visitors, state parks had the highest number of visitors (6.8 million), followed by bikeways (1.4 million), beaches (1.2 million),

and then campgrounds (77,000). These visitors generated \$38.8 million in state and local revenue and had a \$312 million economic impact, which in turn supported over 3,700 jobs. A majority of spending was from bars and restaurants (\$89.1 million), gas stations (\$75.9 million), hotels and motels (\$49.5 million), and grocery stores (\$46.7 million). On average, out-of-state visitors spent considerably more per visit at \$95 compared to in-state visitors, who spent almost \$16. Although not all of this economic output or visitation can be attributed to wildlife viewing, it is likely an activity that many visitors partake in when they visit these venues.<sup>9</sup>

Overall, wildlife viewing is a recreational activity that brings immense economic value to the NBW. In total in 2011, more than 172,000 wildlife viewers spent over \$397 million (2016 dollars) within the NBW on related expenditures (e.g., food, lodging, transportation, and equipment), helping boost the economy of the states within the watershed (Table 5). These expenditures included over \$121 million (2016 dollars) of trip related expenses and \$276 million (2016 dollars) spent on equipment. It is important to note that these expenditures can include both long- and short-term expenses—for example, long-term expenses would be purchasing equipment (a purchase that is made and then will last for an extended period of time), whereas short-term expenses would include activities like purchasing food and accommodations (these purchases are repeatedly/continually made over time).

**Table 5: Estimated Expenditures of Wildlife Viewers in the NBW (2011) (in 2016 dollars)**

	<b>Expenditures (\$1000s)</b>	<b>Trip Related Expenses (\$1000s)</b>	<b>Equipment/Other Spending (\$1000s)</b>	<b>Average per Participant</b>
<b>RI</b>	\$191,521	\$75,393	\$116,128	\$440
<b>MA</b>	\$206,215	\$46,167	\$160,048	\$733
<b>Watershed</b>	\$397,736	\$121,560	\$276,176	\$592

*Note:* Scaled by ratio of state population in the watershed: RI = 88.8%, MA = 15%

Source: 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, 2013

## **Future Threats and Opportunities**

Land use | Open space | Salt Marshes | Temperature

The future of wildlife viewing relies on the preservation of open space, forests, salt marshes, and other natural habitats in the NBW. These environments are under threat from anthropogenic and natural stressors such as population growth, human developments, and climate change. Forests provide an especially important habitat for a number of wildlife viewing species, such as bird species and land mammals. Historically, population growth and increasing human settlements within in the NBW have been major drivers of deforestation—from 2001 to 2011, forest coverage in the area decreased by 4.3%, decreasing the amount of habitat for wildlife and wildlife viewing.<sup>10</sup> Forests are also under pressure from changes in temperature and precipitation patterns related to climate change. The National Oceanic and Atmospheric Administration (NOAA) expects the temperature in the



Northeast to rise by an average of 7° F by 2100.<sup>11</sup> Such a change could alter the flora and fauna in the NBW, posing both a threat for current species in the area as well as an opportunity for new species to migrate into the area due to new warmer temperatures (for more information on the impacts of climate change on forest, please see the “Forestry” section). However, efforts must be taken to maintain and conserve these lands. Mass Audubon estimates that between the years of 2005 to 2013, 13 acres of land were developed every day, leading to the loss of 38,000 acres of forest.<sup>12</sup>

Furthermore, an opportunity to preserve wildlife is increased protection for open space land. Like forests, open space land is vulnerable to human threat. Seventeen percent of open space lands in the NBW are not protected, leaving them open to development. Actions from state and private organizations, however, have proven successful in efforts to conserve open space. Mass EOEEA estimates that in MA alone, these organizations successfully championed the protection of almost 110,000 acres of conserved land between 1999-2005.<sup>13</sup>

Additionally, species distribution and boundaries may shift as air and water temperatures increase. For example, the habitat boundaries of colder water species, such as the harp seal, may move further north and the species may no longer inhabit the waters of the NBW. On the other hand, increasing water temperatures make the NBW increasingly hospitable to warmer water species, such as the manatee, providing a new opportunity for wildlife watching of previously unavailable species.<sup>14</sup> Habitat changes on land may also occur for species such as the leatherback turtle and the piping plover, who use coastal areas for nesting grounds, which will be susceptible to immersion under sea level rise.

Furthermore, salt marshes (another critical habitat for wildlife), such as Allin’s Cove and the Galilee Salt Marsh, are under increasing stress from climate change. Sea level rise and increasing water temperatures threaten the health and future of salt marshes. It is estimated that 13-87% of salt marshes will be lost with just a one to five-foot rise in sea level, well below the 9.8-foot estimate from NOAA by the year 2100.<sup>15</sup> <sup>16</sup> Overall, proper actions to mitigate and address these changes are imperative to protect both wildlife and the economic impact of wildlife viewing in the NBW in the future.

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<sup>1</sup> Source: USFWS, 2013.

<sup>2</sup> Source: USFWS, 2013.

<sup>3</sup> Source: Wight, 1996.

<sup>4</sup> Source: Wilson, 2015.

<sup>5</sup> Sources: Audubon Society of RI, n.d.; Mass Audubon, n.d.; USFWS, 2006.

<sup>6</sup> Sources: Audubon Society of RI, n.d.; Mass Audubon, n.d.; USFWS, 2006.

<sup>7</sup> Source: USFWS, 2013.

<sup>8</sup> Sources: Audubon Society of RI, n.d.; Mass Audubon, n.d.; USFWS, 2006.

<sup>9</sup> Source: Sproul, 2017.

<sup>10</sup> Source: NBEP “Land Use,” 2017.

<sup>11</sup> Source: NBEP “Temperature,” 2017.

<sup>12</sup> Source: MassAudubon “Losing Ground,” 2014.

<sup>13</sup> Source: NBEP “Open Space,” 2017.

<sup>14</sup> Source: Heffener, et al., 2012.

<sup>15</sup> Source: NBEP “Salt Marshes,” 2017.

<sup>16</sup> Source: NBEP “Sea Level,” 2017.



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## Appendix

**Table A1: Away-from-Home Wildlife Viewing Participation  
in MA & RI (2011)**

	<b>Number of Wildlife Viewers (1000s)</b>	<b>Number of Trips (1000s)</b>	<b>Number of Viewing Days (1000s)</b>	<b>Average Number of Viewing Days</b>
<b>RI</b>	82	909	1,231	15
<b>MA</b>	662	4,514	10,546	16
<b>Total</b>	744	5,423	11,777	

Source: 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, 2013

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