

NARRAGANSETT BAY WATERSHED ECONOMY

The ebb and flow of natural capital



Hunting Overview

Hunting for big game, small game, migratory birds, and other animals is a popular recreational activity within the Narragansett Bay watershed (NBW). In fact, hunters in the NBW are more plentiful than hunters in other small states such as Delaware or Hawaii.¹ Residents and visitors hunt on private land, leased land, and in parks or public lands managed by Rhode Island (RI) or Massachusetts (MA). Game including deer, hare, and waterfowl are

the most popular hunted animals, but turkey and pheasant are also commonly hunted. In RI, small game hunting is the most popular, while in MA big game hunting is the most popular type of hunting.²

More than 26,000 hunters were active within the NBW in 2011, a 21% increase from 2001.³ These hunters took nearly 560,000 trips over more than 530,000 days in one year. Nearly \$32 million (in 2016 dollars) was spent on hunting related expenditures, such as food, lodging, transportation, and equipment.⁴

History

Hunting has been an important aspect of the NBW since pre-colonial times when native tribes hunted for sustenance. Over time, hunting has transitioned from a task necessary for survival to a recreational activity. As the popularity of recreational hunting continued to increase in the watershed, laws were created and branches of government were established to enforce the laws. In 1739, MA was the first state in the nation to appoint game wardens for hunting law enforcement to preserve and increase deer populations.⁵ Likewise, in RI, the Commissioners of Birds was created in 1899 to enforce hunting laws.⁶

Since 1978 in RI, the Division of Law Enforcement in the Department of Environmental Management (RIDEM) has enforced environmental laws related to hunting.⁷ The state also mandates training in safe hunting practices for those applying for a hunting license for the first time.⁸ As time has progressed, hunting has not only become a recreational activity, but also a means to control populations of certain animals in the NBW such as deer and coyotes.

Today, hunting takes place on various lands within the NBW. In RI, there are over 11,000 acres of private lands enrolled in the RIDEM co-op deer hunting program. In the 2015-2016 deer season,

almost 600 permits were issued to hunt on these lands. There are also more than 48,000 acres of state land in 27 wildlife management areas available to RI deer hunters.⁹ In MA, the Land Protection Program provides areas for recreational hunting. In 2015, this program protected over 2,000 acres of wildlife lands and, in total, has protected more than 200,000 acres. All protected lands are open to the public for hunting, fishing, and other passive recreation.¹⁰

Data Sources and Limitations

Estimates of participation rates and expenditures are provided for the economic impact of hunting within the NBW. These data are derived from the U.S. Fish and Wildlife Service (USFWS) 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. The USFWS survey focuses on those at least 16 years old, and this report only focuses on hunting that occurs within RI and MA state borders, disregarding out-of-state hunting by RI and MA residents.

To estimate the recreational hunting 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 (for a map of the NBW and its population, please reference the "Geography" section of this report). This equates to 88.8% of the state population in RI and 15% in MA. This approach assumes that participation rates for hunting are the same in both watershed and non-watershed areas. For example, the USFWS estimate of 20,000 recreational hunters in RI translates into around 17,800 hunters in the RI portion of the watershed.

Additional information on methodology used in this report can be found in the "Methodology" section.

Current Status and Trends

Today, many individuals participate in recreational hunting in the NBW. Based on previously stated assumptions, in 2011 there were over 26,000 hunters in the watershed (Table 1). On average, each hunter spent on average 20 days hunting in a year. In total, these hunters took nearly 560,000 trips and spent more than 530,000 days hunting.¹¹

Table 1: Estimated Recreational Hunting in the NBW (2011)

	Number of Hunters (1000s)	Number of Trips (1000s)	Number of Hunting Days (1000s)	Average Number of Hunting Days
RI	17.8	423.6	372.1	21
MA	8.4	134.7	159.3	19
Watershed	26.2	558.3	531.4	20.3

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

According to the survey, a large portion of the hunters are state residents (Table 2). Within the watershed, there are over 21,000 individuals who hunt in their own state, which represents 81% of the hunters in the watershed. The remaining 19% are out-of-state tourists, who bring in economic value to the region.ⁱ

Table 2: Estimated Residential Recreational Hunting in the NBW (2011)

	Number of Hunters (1000s)	Number of Trips (1000s)	Number of Hunting Days (1000s)	Average Number of Hunting Days
RI	13.3	241.5	220.2	17
MA	7.8	131.4	156.2	20
Watershed	21.1	372.9	376.4	17.8

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

According to the survey, the majority of hunters in the NBW are white, middle-aged men from urban areas (Table 3).¹²

Table 3: Characteristics of Residential Hunters in the NBW (2011)

	RI	MA
From urban area	76%*	73%*
Males	86%	88%
Between ages 45-64	50%*	66%*
White	100%	95%
4 years or more of college	24%*	36%*
Percent of days hunting on private land	78%*	58%*
Average number of days hunting per year	17	20

*Based on a sample size of 10-29

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

Overall, hunting is a recreational activity that brings considerable economic value to the NBW. In total in 2011, more than 26,000 hunters spent nearly \$32 million (in 2016 dollars) within the NBW, helping boost the economies in RI and MA (Table 4). Hunters pay for guides, access, membership dues, land, guns, ammunition, licenses, permits, auxiliary equipment, and specialized clothing. Hunters may also travel far enough to areas where lodging and food become necessary. Hunters within the NBW spent nearly \$32 million (in 2016 dollars) on related expenditures (e.g., food, lodging, transportation, and equipment). It is important to note that there are both long- and short-term impacts of this expenditure; for example, a short-term impact would be purchasing ammunition, guns, or accommodations, while long-term impacts may include membership dues, licenses, and permits.

ⁱ We do not know the number of non-residents who are RI or MA residents hunting across state lines, but still within the watershed.

Table 4: Estimated Expenditures of Hunters in the NBW (in 2016 dollars)

	Expenditures (\$1000s)	Trip Related Expenses (\$1000s)	Equipment/Other Spending (\$1000s)	Average per Participant
RI	\$17,490	\$4,404	\$13,086	\$983
MA	\$14,117	\$2,734	\$11,383	\$1,681
Watershed	\$31,607	\$7,138	\$24,469	\$1,294

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

Hunting relies heavily on the availability of healthy habitats for game animals, mainly forests and open space. Increasing populations and urban sprawl are placing stress on these resources. Not only is population rising in the NBW, but settlement patterns are changing; urban areas are no longer the hotspot for population growth—instead, populations are expanding outward and settling in previously less-developed areas. As a result, people are developing open space and forests land. For example, from 2001 to 2011, the amount of forest coverage in the NBW decreased by 4.3%, while the amount of urban land increased by 8.5%.¹³ Open space faces the same threat—in the NBW, 15% of total land coverage is protected open space, but 17% of open space in the NBW is not protected, making it vulnerable to human development. There is, however, the opportunity to preserve this open space and therefore protect the benefits it provides, such as hunting. Mass EOEA found that initiatives spearheaded by private and state organizations led to the permanent preservation of nearly 110,000 acres of open space land in MA from 1999-2005.¹⁴ These efforts indicate the success of initiatives in protecting open space areas.

Furthermore, the effects of climate change will have an impact on species distribution and populations in the NBW. For example, two popular hunting species, the wild turkey and the white-tailed deer, are susceptible to the effects of climate change. The habitat distribution of the wild turkey will shift increasingly northward, with the Audubon Society predicting that the bird will lose 80% of its wintertime range by the year 2080, reducing populations available for hunting (Figure 1).¹⁵ The white-tailed deer, on the other hand, will become more susceptible to diseases that will thrive in warmer temperatures.¹⁶ This will be coupled with an increase in deer populations due to decreased mortality rates during winters and increased reproduction rates.¹⁷

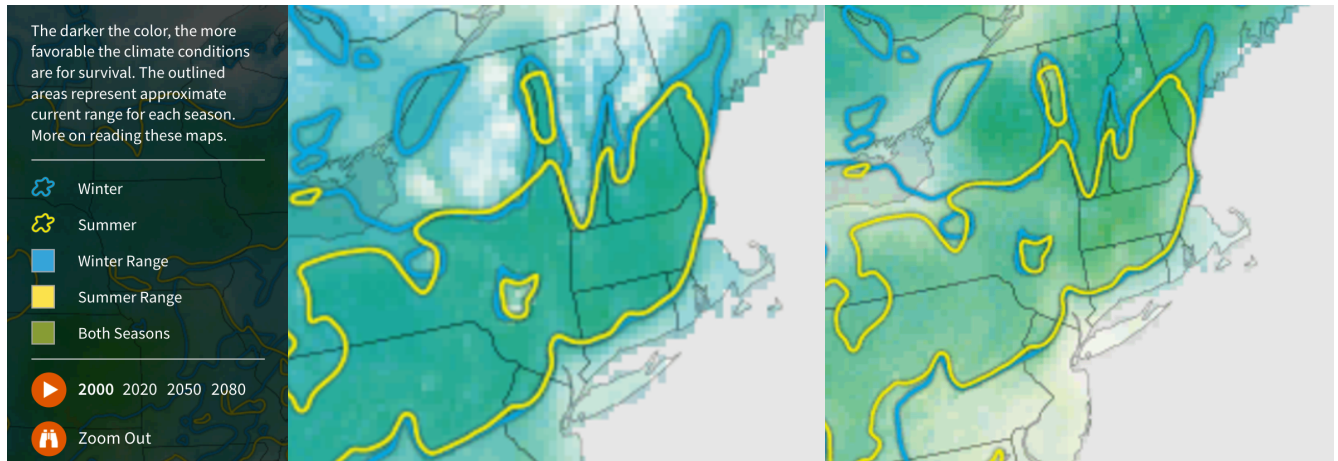


Figure 1: Habitat Changes of Wild Turkey Due to Climate Change (Left: 2000, Right: 2080)

Note: Darker areas indicate more conducive habitats for wild turkey populations. As seen from above, the winter and summer boundaries in RI will stay the same but will be less hospitable areas for wild turkey habitats.

Source: Audubon Society, n.d.

References

- Audubon Society. (n.d.). *Climate Threatened: Wild Turkey*. Retrieved from <http://climate.audubon.org/birds/wiltur/wild-turkey>.
- Massachusetts Department of Fish & Game (MA DFG). *Massachusetts Wildlife Lands*. (n.d.) Retrieved on 03 January 2017 from <http://maps.env.state.ma.us/dfg/masswildlifelands/>.
- Massachusetts Energy and Environmental Affairs (MEEA). (n.d.). *National Resource Conservation History in the Commonwealth*. Retrieved on 03 April 2017 <http://www.mass.gov/eea/grants-and-tech-assistance/enforcement/environmental-police/history-of-the-environmental-police.html>.
- Narragansett Bay Estuary Program (NBEP). (2017). *State of the Narragansett Bay and Its Watershed: Land Use*. Retrieved from <http://nbep.org/the-state-of-our-watershed/technicalreport/>.
- Narragansett Bay Estuary Program (NBEP). (2017). *State of the Narragansett Bay and Its Watershed: Open Space*. Retrieved from <http://nbep.org/the-state-of-our-watershed/technicalreport/>.
- Rhode Island Department of Environmental Management (RIDEM) – Division of Fish and Wildlife. (2016). *2015-2016 Rhode Island White-Tailed Deer Status Report*. Retrieved from www.dem.ri.gov/programs/bnatres/fishwild/pdf/deerharv.pdf.
- Rhode Island Department of Environmental Management (RIDEM) – Division of Fish and Wildlife. (n.d.) *Hunter Education Program History and Significance*. Retrieved from <http://www.dem.ri.gov/programs/fish-wildlife/wildlifehunter/education/history.php>.
- Rhode Island Department of Environmental Management (RIDEM) – Division of Law Enforcement. (n.d.) *The History of the Division of Law Enforcement*. Retrieved from <http://www.dem.ri.gov/programs/law/history.php>.
- U.S. Fish and Wildlife Service (USFWS), Economics and Statistics Administration, U.S. Census Bureau, Department of Interior, & Division of Federal Aid. (2003). *2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation – Massachusetts*. Retrieved from <https://www.census.gov/prod/2003pubs/01fhw/fhw01-ma.pdf>.
- U.S. Fish and Wildlife Service (USFWS), Economics and Statistics Administration, U.S. Census Bureau, Department of Interior, & Division of Federal Aid. (2003). *2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation – Rhode Island*. Retrieved from <https://www.census.gov/prod/2003pubs/01fhw/fhw01-ri.pdf>.
- U.S. Fish and Wildlife Service (USFWS), U.S. Department of the Interior, U.S. Department of Commerce, & U.S. Census Bureau. (2013). *2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation - Massachusetts*. Retrieved from <https://www.census.gov/prod/2013pubs/fhw11-ma.pdf>.
- U.S. Fish and Wildlife Service (USFWS), U.S. Department of the Interior, U.S. Department of Commerce, & U.S. Census Bureau. (2013). *2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation – National Overview*. Retrieved from <https://www.census.gov/prod/2012pubs/fhw11-nat.pdf>.

U.S. Fish and Wildlife Service (USFWS), U.S. Department of the Interior, U.S. Department of Commerce, & U.S. Census Bureau. (2013). *2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation – Rhode Island*. Retrieved from <https://www.census.gov/prod/2013pubs/fhw11-ri.pdf>.

Wisconsin Department of Natural Resources (2013). *Climate Change Impacts on Wisconsin's Wildlife: A Preliminary Assessment*. Retrieved from <http://dnr.wi.gov/files/pdf/pubs/ss/ss0197.pdf>.

References Not Cited in Footnotes

Hall-Arber, M. et al. (2001). *New England's Fishing Communities*. Cambridge: MIT Sea Grant College Program. Retrieved from https://seagrant.mit.edu/publications/MITSG_01-15.pdf.

Massachusetts Department of Fish and Game (MA DFG) – Division of Fisheries and Wildlife (MassWildlife). (2015). *FY 2015 Land Acquisitions by Department of Fish and Game & MassWildlife*. Retrieved from <http://www.mass.gov/eea/docs/dfg/dfw/habitat/land/sportsmen-2015.pdf>.

Rhode Island Department of Environmental Management (RIDEM) – Division of Fish and Wildlife. (2015). *Hunting Regulations For the 2015-2016 Season*. Retrieved from <http://www.dem.ri.gov/pubs/regs/regs/fishwild/hunt1516.pdf>.

¹ Source: USFWS et al. (2011 National survey), 2013.

² Sources: USFWS et al. (2011 RI and MA surveys), 2013.

³ Sources: USFWS et al. (2001 RI and MA surveys), 2003.

⁴ Sources: USFWS et al. (2011 RI and MA surveys), 2013.

⁵ Source: MEEA, n.d.

⁶ Source: RIDEM Division of Law Enforcement, n.d.

⁷ Source: RIDEM Division of Law Enforcement, n.d.

⁸ Source: RIDEM Division of Fish and Wildlife, n.d.

⁹ Source: RIDEM Division of Fish and Wildlife “White Tailed Deer,” 2016.

¹⁰ Source: MA DFG “Massachusetts Wildlife,” 2015.

¹¹ Source: USFWS et al. (2011 RI and MA surveys), 2013.

¹² Sources: USFWS et al. (2011 RI and MA surveys), 2013.

¹³ Source: NBEP “Land Use,” 2017.

¹⁴ Source: NBEP “Open Space,” 2017.

¹⁵ Source: Audubon Society, n.d.

¹⁶ Source: Penn State, 2015.

¹⁷ Source: Wisconsin Department of Natural Resources, 2013.

Appendix

Table A1: Recreational Hunting in MA & RI (2011)

	Number of Hunters (1000s)	Number of Trips (1000s)	Number of Hunting Days (1000s)	Average Number of Hunting Days
RI	20	477	419	21
MA	56	898	1,062	19
Total	76	1,375	1,481	

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

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