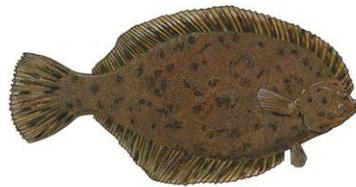




Rhode Island Wildlife Action Plan



Prepared by Terwilliger Consulting Inc.

for

The Rhode Island Chapter of The Nature Conservancy

for

**The Rhode Island Department of Environmental Management
Division of Fish and Wildlife**

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Introduction

This document is the 10-year revision of Rhode Island's Wildlife Action Plan (WAP), an effective strategy for wildlife conservation enabled through the State Wildlife Grants (SWG) program administered by the U.S. Fish and Wildlife Service (USFWS). The goal of this document is to provide direction of wildlife conservation efforts for the next decade. It represents a vision and a strategy that the Rhode Island Department of Environmental Management's Division of Fisheries and Wildlife (RI DEM DFW) shares with its partners for conservation of wildlife in the state.

This WAP document is presented in three complementary formats: first, this comprehensive strategic plan; second, the accompanying species and habitat profile fact sheets; and third, a Community Companion Guide to the RI WAP. These were assembled in partnership with RI DEM, The Nature Conservancy (TNC), the University of Rhode Island (URI), and the RI Natural History Survey (RINHS). Together these documents present the most current information available on Rhode Island's wildlife and on the habitats and natural systems that support it. It also includes detailed information on the various threats to wildlife and to individual species in the state and outlines strategies for addressing those threats.

In part, the 2015 Rhode Island WAP is a barometer of the State's ecological health. It offers a composite picture, based on up-to-date science and using the most advanced analytical tools available. This WAP cannot guarantee the future of wildlife in Rhode Island—which is, in many ways and from many directions, under threat. But it *can* help Rhode Islanders take important, necessary steps toward that end.

Wildlife thrives in wild places. And one goal of this effort to develop the 2015 WAP is to see that, wherever possible, Rhode Island's remaining wild lands are preserved. Another equally important goal is to create a solid and practical framework for wildlife management, for government and individual decision-making, and for protecting species that have been identified through a rigorous process as species of greatest conservation need.

Background

Even though it is the smallest and the second-most densely populated state in the U.S., Rhode Island's wildlife is remarkably diverse. It includes thousands of resident and migratory species of mammals, birds, fish, reptiles and amphibians, beetles, butterflies and moths, and other insects, freshwater mollusks, annelids, crustaceans, and other marine invertebrates.

From the western highlands to the coastlines and the adjoining ocean waters, the state supports a broad spectrum of biodiversity, ranging from the rarest and most endangered species to the most common and abundant.

The focus of this WAP is on Rhode Island, but it must also be seen within a regional and even a global context. The ecological health of species and natural systems in Rhode Island are affected, not just by what happens in adjoining states, but also by events occurring hundreds, even thousands of miles away.

Rhode Island's forests replenish oxygen and cleanse the air; wetlands clear toxic elements from the water and absorb runoff. Birds and other wildlife species help control pests, disperse seed, recycle nutrients, pollinate plants, and maintain a resilient but still delicate balance; a web-of-life that also is in need of

conservation and long-term stewardship. The contributions that wildlife and wild places make to the quality of life in the Rhode Island cannot be fully measured or quantified.

Chapter 1 presents an overview of Rhode Island's wildlife, within a regional context that encompasses thirteen states from Maine to Virginia and D.C. Among the 874 vertebrate species documented in Rhode Island, birds—with more than 430 species—are the dominant taxonomic group. Fish are the second-largest category, with 306 species, followed by mammals (92), reptiles (26), and amphibians (19). Within this chapter, each of the main vertebrate groups is discussed separately. Information on the more than 3,500 invertebrate species is also included.

The intent of the WAP is to compile, evaluate, and present summary status information for species of greatest conservation need (SGCN), along with the best sources for this information. The 2015 list of SGCN for Rhode Island includes 454 species, which is 91 more species than appeared on the SGCN list in 2005. This figure results from the addition of 182 species and the removal of 91 others. In addition, more detailed profiles of each species or group of species have been developed for the first time in Rhode Island. These profiles address the status and distribution, threats and actions for each of these species/groups.

Several national and regional frameworks have been developed to address the conservation needs of birds, especially those in the SGCN category. In Rhode Island, as throughout the Northeast, bird habitats have been heavily altered by four centuries of human activity since the arrival of the European colonists. The accumulated impact of human population growth and associated changes in land use has been profound. Separate sections are devoted here to pelagic, inshore, coastline, marine island, beach, intertidal/mudflat, wetland, salt-marsh, freshwater marsh, pond, early successional habitat, grassland, shrub/scrub, and forest birds, as well as other birds that do not fit naturally within these categories, such as the chimney swifts which use man-made structures for nesting.

Regionally, reptile and amphibian species face multiple threats, from habitat loss and fragmentation, pollution, and illegal harvest; and the same is true of the 23 species native to Rhode Island. It is worth noting that approximately half of these 23 species are listed as SGCN.

Likewise, human activity continues to have an impact on aquatic systems across the Northeast. Pollution, over-harvesting, the introduction of non-native species into the ecosystem, alteration of natural habitat (e.g., the introduction of dams, etc.), and global climate change and associated alterations in weather patterns are among these threats.

The majority of Rhode Island's fish diversity consists of saltwater species; and this diversity attracts both commercial and recreational fishermen. Harvests are declining. The volume of landings for all species of finfish and shellfish in 2000 was 36% higher than it was in 2010, while the *unadjusted* value of these species in 2000 was 25% higher than it was in 2010. When adjusted for inflation, the 2000 value of this combined harvest in 2010 dollars was \$101,474,041; which is 60% greater than the value in 2010.

Among invertebrates, tiger beetles; butterflies, moths, and skippers; freshwater mussels; and marine invertebrates such as quahogs, oysters, and horseshoe crabs are notably at risk.

Although plants are not included in SWAPs, they comprise a significant portion of Rhode Island's (and the region's) biodiversity, creating in many cases the habitats in which animal species thrive or decline. It is worth noting here that a recently updated (2014) publication *Rare Plants of Rhode Island* includes 20 new additions since the list was last updated in 2007; and that 320 plant species—roughly 25% of Rhode Island's native flora—are now classified as “rare.”

This chapter also takes note of the monetary value of wildlife and wildlife-related activities in Rhode Island. For example, in 2011, a total of 503,000 residents and non-residents participated in wildlife-associated recreation in the state, spending \$348 million on fishing, hunting, and the observation of wildlife.

The statistics are striking. USFWS estimates that more than 200,000 people annually enjoy bird watching in Rhode Island. RI DEM maintains 30 parks and management areas that draw six million visitors to the state each year, generating \$1.7 billion in annual revenue.

At the same time 20,000 hunters (residents and non-residents) spent approximately \$18 million on hunting-related activities in Rhode Island in 2011 alone. In the same year, an estimated 175,000 anglers spent more than \$130 million in the state. Wildlife is part of the culture and the conservation ethic in which Rhode Islanders take pride.

Rhode Island's forests replenish oxygen and cleanse the air; wetlands clear toxic elements from the water and absorb runoff. Birds and other wildlife species help control pests, disperse seed, recycle nutrients, pollinate plants, and maintain a resilient but still delicate balance; a web-of-life that also is in need of conservation and long-term stewardship.

Chapter 2 examines Rhode Island's habitats in relation to the state's wildlife, especially its SGCN. Without suitable habitat, wildlife cannot exist. Likewise, wildlife diversity depends on a diversity of habitat, which Rhode Island offers in abundance. The state's varied geology, soil types, topography, and hydrology support a range of plant communities that in turn provide the basis for a complex ecological framework.

Here, the regional context is especially important. The Northeast is still 60% forested, but the average forest age is young at approximately 60 years. The region contains more than 200,000 miles of rivers and streams; 34,000 bodies of water; and more than 6 million acres of wetlands. It also contains 732,000 miles of roads and has the highest density of dams and other obstacles to fish passage in the country. One third of the forest land and one quarter of the wetlands that existed when the first European settlers arrived have been permanently altered for human use.

Region-wide, 16% of the region is secured against development. State governments together own the largest share of conserved land (12 million acres). The U.S. government holds 6 million acres. Private lands held in easements account for 3 million acres; and land owned by private non-profit land trusts totals another 1.4 million acres. At the same time, the current rate of land conversion outweighs land acquisition by a factor of 2:1. Rhode Island is the second-most densely populated state in the country, and development pressures on land throughout the state are increasing.

Rhode Island's climate is hospitable and governed largely by its proximity to the Atlantic Ocean. Climate change is given special consideration in this WAP because its scope reaches beyond the state's borders and because it exacerbates many other threats to wildlife and affects each species differently. Sea levels are rising while changes in other indicators such as length of growing season have been observed in many areas.

This chapter also explores the concept of Ecological Regions in relation to Rhode Island's landscape. The state lies within the Lower New England Section of the Eastern Broadleaf Forest Province, in which disturbance by human settlement has resulted in an ecological shift to a system that lacks large predators and therefore suffers from an imbalance between plant resources and herbivores.

Chapter 2 also provides an analysis of the various ecological systems that characterize the state, including: forests, non-forested uplands, early successional habitats (many created when former farmland is abandoned), agricultural lands, fresh water wetlands, estuarine wetlands (among the most important wildlife habitats in North America—and the most threatened), salt-marshes, lakes and ponds, and marine habitats.

A table at the end of the chapter rates the various ecological systems in terms of their importance to biodiversity, current condition, degree of threat, and vulnerability to climate change. The Key Habitat Profiles include descriptions, their location and relative condition for each key habitat.

Chapter 3 analyzes the threats to SGCN and their habitats in Rhode Island. Some of these threats are global or national, while others are regional, statewide, or local. They include threats or “problems” that stress wildlife (species and/or habitat) as well as management challenges caused by inadequate data, insufficient resources, or other limitations.

The primary threat to Rhode Island's fish, wildlife, and their habitats is conversion of land for housing, urban growth, and commercial, industrial, transportation, or recreational uses. Although Rhode Island's population has not grown appreciably in the past ten years, there has been a shift in population from cities and towns in the state's urbanized corridor to formerly rural areas. Increases in residential and commercial development in rural areas account for much of the reported losses in wildlife habitat and related natural resources. This development has also resulted in a significant loss of prime farmland.

The need for a growing transportation infrastructure compounds the effects of these shifts in population. Fragmentation subdivides large contiguous areas of natural land into smaller and smaller patches, creating more edge habitat and less interior habitat. This trend toward greater fragmentation of the landscape has had a profound impact on both individual species and the diversity and balance of the system as a whole.

Conservation initiatives have been established, in particular the RI DEM Land Conservation Program, in an effort to protect important natural areas and to ensure proper management of land that has a high intrinsic resource value. Emphasis is placed on several critical elements, including protection of working farms and prime farmland, forests, drinking water sources, lands used for recreation, and areas that are rich in natural heritage and/or biodiversity. The State Land Conservation Program, the Local Open Space Grant Program, and the Agricultural Land Preservation Program are discussed here in detail.

The introduction of invasive or exotic (non-native) species is another very significant threat to Rhode Island's wildlife. Today, nearly all (97%) of the key habitats in Rhode Island are threatened by invasive plant species, the most common being *Phragmites australis*. Human introduction alone is not the only source of invasive species, species also shift ranges due to climate change to follow optimal environmental conditions. Several aquatic invasive animal species also pose threats to the ecological balance, especially in river and lake habitats, in particular the Asian and the Zebra Clams, the Asian shore and the Japanese mitten crabs, and several species of Carp.

The changing climate is also now widely recognized as a potential major threat to fish and wildlife habitats, populations, and communities. Species and populations likely to have greater vulnerabilities to climate change include those with highly specialized habitat requirements, species already near their temperature limits or having other narrow environmental tolerances, rare or declining populations with poor dispersal or migratory capacity, and groups that are especially sensitive to pathogens.

Climate modeling analyses for the northeastern region of the U.S. predict major changes occurring over the rest of this century. These include: higher air and water temperatures; reduced extent and duration of snow cover; more frequent and severe summer droughts; earlier and more prolonged low-flow periods in rivers and streams; winter and spring floods of shorter duration but higher intensity; delayed ice formation and earlier spring melt; increasing precipitation overall and shifts in winter precipitation type.

Rising sea levels are also predicted—and in fact, already occurring. Major impacts on coastline habitats are likely, and while the exact nature of these impacts is difficult to predict, it is clear that estuarine wetlands and other coastal habitats are the most vulnerable.

Critical habitats—areas in which targeted species can persist and/or relocate over time—may provide a refuge from climate change impacts and become high-priority candidates for protection and conservation efforts. Among the various habitat types, brackish marshes and tidal flats may be the most vulnerable, while pitch pine woodlands/barrens, oak-pine forests, and warm water rivers and ponds may be the most resilient.

As the composition of ecological communities change over the next century, this presents an added challenge for conservationists. The identification and protection of ecological land units (ELUs) may help the conservation community to address this challenge. ELUs are areas on the landscape with unique physical properties based on soil characteristics and topography. Areas with many different ELUs often support diverse plant and animal communities and show high levels of biodiversity.

The relationship between physical diversity and ecological diversity is important because, as the climate changes, lands that are highly variable with respect to their physical properties are likely to support more diverse communities of plants and animals. Such lands are therefore prime candidates for protection and conservation.

Pollution remains a major threat. The Northeast is not only the most populated area of the country, but its buildings and infrastructure are generally older and septic and wastewater systems are often out-of-date. Storm water runoff further degrades water quality through erosion. Increases in the amount impervious surface in high-drainage areas pose another major threat.

The loss of wetlands, urban and agricultural runoff, sedimentation, pollution, and other factors will continue to affect the health of aquatic ecosystems. One mitigating factor in Rhode Island is the increasing number of organic farms, which do not rely on pesticides, artificial fertilizers, or other chemical “enhancements.”

Overharvesting of resources; human intrusion and disturbance, especially along beaches; and wildlife diseases such as White Nose Syndrome are also important threats to Rhode Island’s wildlife. Stresses placed on plants and vegetated areas that support wildlife; energy extraction and production; and—ironically—new, alternative energy developments such as wind turbines and biomass fuels pose additional challenges to the conservation of wildlife in the state.

Chapter 4 recommends a broad range of action steps. Other conservation and management plans have identified a range of goals, objectives and strategies for addressing threats to wildlife at the local, state, regional, and national scales. A careful survey of these existing plans was undertaken as part of the process for developing the recommendations presented here.

This WAP recognizes that threats to wildlife occur at multiple levels, from global trends to the most localized impacts. Thus, the actions recommended in Chapter 4 are presented in a multi-tiered format, from overarching, statewide conservation needs to those focused on a particular species or type of habitat. On the broader scale, actions are recommended to address the threats posed by lack of resources and advocacy for comprehensive wildlife conservation; habitat loss due to fragmentation; insufficient information; lack of research and landscape-level monitoring; and degradation from pollution and disease.

Specific action steps are also recommended to protect mammals, birds, reptiles and amphibians, freshwater fish, marine/estuarine fish, marine invertebrates, beetles, butterflies and moths, dragonflies, and mussels. The same is true for a broad range of habitats from upland, evergreen, and deciduous forests to agricultural habitats, grass and shrub-lands, wetlands, marshes, rivers and streams, estuaries and coastal waters, and even urban habitats where species like the peregrine falcon have developed important ecological niches within the built environment.

In total, Chapter 4 presents hundreds of individual inventory/research/monitoring needs and conservation actions. Together they provide a detailed blueprint and a clear, comprehensive strategy for addressing Rhode Island’s wildlife conservation needs.

Chapter 5 discusses the need for effective monitoring and adaptive management. Monitoring is needed to assess trends affecting wildlife and to track the success of conservation actions. Adaptive management allows agency personnel and others to respond effectively as conditions—land use patterns, climate, human population, and available data and other information—change. Rhode Island already has a number of effective monitoring programs in place. The Rhode Island Environmental Monitoring Collaborative, for example, is a partnership of agencies, organizations, and individuals involved in monitoring the state’s aquatic environments.

Coordination of monitoring efforts and the effective sharing of information are of key importance to the implementation of Rhode Island’s WAP. Although the tools available for monitoring progress have

become more sophisticated and more widely used since 2005, the need to develop new tools that are better suited to a non-traditional systems approach remains. This work is inherently complex; and the status of diverse natural biological communities is inherently more difficult to quantify and measure than that of a single species.

An extensive list of the existing monitoring programs and actions is included in this chapter, along with information on the gaps in data being gathered through these existing programs. Rhode Island's biodiversity monitoring strategy includes regular evaluation of conservation actions to measure their success and effectiveness in achieving the goals outlined in this WAP.

The priority Inventory, Research, and Monitoring sections in the previous Chapter (4) recommend the appropriate level of monitoring for each species and habitat. Short-term, interim, and long-term monitoring objectives are discussed here, along with the various tools and mechanisms used to achieve these objectives. Criteria in the form of Annual Accomplishment Measures for evaluating success in planning, research, conservation design, information management, funding, and professional and public outreach are also included.

Chapter 6 describes the process and the timeframe by which Rhode Island's WAP will be reviewed and updated. Full revision will be completed in ten years (2025). Interim sections will be reviewed and revised throughout the ten-year period. The goal is to keep the document as up-to-date as possible. As gaps in the data that exists in 2015 are filled, new ones will be identified. Knowledge of the status of Rhode Island's wildlife and the conditions that affect wildlife management are constantly changing. Thus, the current WAP is seen as a dynamic document.

This chapter also describes the review process and presents a schedule for the review of other Conservation and Management plans and identifies the agencies responsible. Information from the review of these plans will inform the ongoing review of the Rhode Island WAP. Evaluation of the conservation actions recommended in this document will be continuous as new information becomes available. Annual measures for reporting accomplishments are conducted through TRACS through Federal Aid project reporting.

Chapter 7 describes coordination with various partners in the development of the 2015 WAP and how this coordination and collaboration will continue through the next ten-year cycle. Opportunities to use existing partnerships and create new ones to help implement the WAP are also described in this chapter. Members of the Planning, Technical, Scientific Review, and Habitat Mapping/GIS teams are identified, and the process of coordination with federal, state, local, and tribal partners is outlined in detail.

State partners include the Rhode Island Geographic Information System (RIGIS) consortium; the Statewide Planning Program of the Department of Administration (DA), including the Growth Planning Council, the Greenways Council and the Rivers Council; the Coastal Resources Management Council (CRMC); and the Department of Transportation (DOT).

The Comprehensive Community Plans that each municipality is required to develop and maintain guide local land use planning in Rhode Island and provide important channels for implementation of the WAP at the local level. Members of the Rhode Island Conservation Partnership are also key participants in the

implementation process. The RI WAP Community Liaison will be providing outreach and technical assistance to these many local partners including municipalities, Conservation Commissions, and Land Trusts.

Federal partners include USFWS; the U.S. Geological Survey (USGS); the U.S. Dept. of Agriculture (Natural Resources Conservation Service, USDA-NRCS); the U.S. Forest Service (USFS); the Environmental Protection Agency (EPA); the National Oceanic and Atmospheric Administration (NOAA); the New England Fishery Management Council (NEFMC); the Atlantic States Marine Fisheries Commission (ASFMC); the Department of Defense (DOD); the U.S. Army Corps of Engineers (ACOE); and the National Park Service (NPS).

The Narragansett Tribe was consulted in the WAP development process and input has been requested throughout each stage of development of the 2015 WAP.

Faculty and study centers at the URI, Brown University, and Roger Williams University have contributed in significant ways to the development of the current WAP. All of these contributors are listed in Chapter 7 and web contact information is provided. Non-governmental organization (NGO) partners include The Nature Conservancy (TNC); the Audubon Society of Rhode Island (ASRI); the RINHS; the National Wildlife Federation (NWF), The Wildlife Society (TWS); the American Fisheries Society (AFS); various individual land trusts; and the Rhode Island Land Trust Council.

This chapter also describes the process of public and stakeholder participation that is a key component in the development and implementation of the Rhode Island WAP. Every effort has been made to communicate with stakeholders and with the public at large throughout the three-year period in which the 2015 Plan was under development, and to solicit their input. Similar efforts will be made throughout the implementation period, including regularly scheduled public events and meetings.

Work leading up to publication of the current document has proceeded under the framework of a stakeholder and public input review plan that included partner and stakeholder meetings as well as correspondence and communication with the public through websites, published articles, newsletters, and a series of public presentations.

Partners and stakeholders will be closely involved in the 10-year implementation of this WAP; and many will continue to play a major role in identifying SGCN and key habitats, as well as in updating and identifying new threats and actions over the next decade. Other stakeholders including members of the general public will be kept informed of any updates; and open, participatory events will be used to solicit additional information and input from the public at large.

Appendices present more detailed supporting material for each of the chapters.

RI WAP SGCN and Key Habitat Profiles are fact sheets that summarize key information about each species or habitat in RI. They include photos and maps wherever possible and list the key threats and actions for them to be conserved in RI.

The **Community Wildlife Conservation Guide** is a short guide intended as a customized, condensed document to guide easy implementation at the local level. It provides information and tools for community implementation of the RI WAP.

Conclusion

In conclusion, there are many challenges facing Rhode Island's wildlife species and the habitats and ecosystems that support them. The intent of the Wildlife Action Plan is to identify those challenges and to recommend important steps that can be taken to conserve wildlife in the state. The tools exist, the networks and partnerships are in place, and the conservation measures needed to protect Rhode Island's wildlife have been identified and are within reach.

This Wildlife Action Plan is a community document designed for public use. The information it contains will be widely disseminated, and it can provide a strong foundation as well as inspiration for the work ahead.

By itself, this Plan cannot guarantee the future of wildlife in Rhode Island—which is, in many ways and from many directions, under threat. But it *can* help Rhode Islanders—legislators, local government officials, park and refuge managers, conservationists, business leaders, educators, and concerned individuals—take important, necessary steps toward that end.