Appendices

A. Endangered Species Information
B. Photograph of Dog Waste Bag BMP
C. Selectman's Agenda from May 28, 2019
D. 2018 Bourne Outfall Map
E. Bourne Initial Outfall Inventory & Ranking
F. Catch Basin Cleaning Program
G. Street Sweeping Program
H. Winter Road Maintenance Program
I. Structural BMP Inspection and Maintenance

Appendix A. Endangered Species Information

Attachment A- ENDANGERED SPECIES

Official IPaC Species List,

Project Review Request, and

USFWS Determination Letter

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To:
Consultation Code: 05E1NE00-2018-SLI-2527
Event Code: 05E1NE00-2018-E-05920
Project Name: Bourne Stormwater MS4 NOI Project Revised

July 26, 2018

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Consultation Code: 05E1NE00-2018-SLI-2527

Event Code: 05E1NE00-2018-E-05920

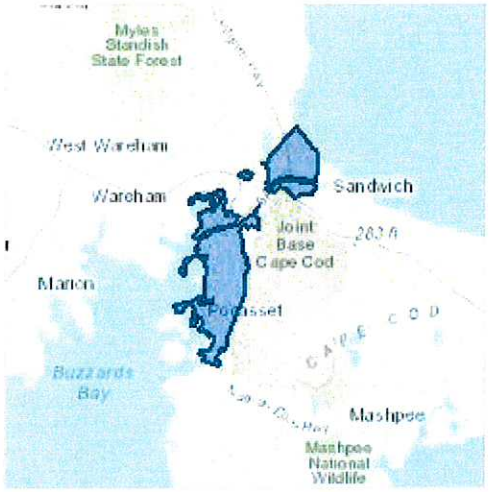
Project Name: Bourne Stormwater MS4 NOI Project Revised

Project Type: Regulation Promulgation

Project Description: The area mapped is for the town of Bourne not including Joint Base Cape Cod. This is for the town's 2018 NOI for coverage under the Small MS4 General Permit. There are outfalls in this area that discharge stormwater from town owned impervious surfaces. There are no new outfalls or structural BMP construction planned at this time.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/41.79162384636371N70.5394885459729W



Counties: Barnstable, MA | Plymouth, MA

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Roseate Tern *Sterna dougallii dougallii* Population: northeast U.S. nesting pop. No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered

Reptiles

NAME	STATUS
Plymouth Redbelly Turtle *Pseudemys rubriventris bangsi*	Endangered

There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/451

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Project Review Request
Submitted 7/30/18 to USFWS

AECOM Imagine it. Delivered.

AECOM
250 Apollo Drive
Chelmsford, MA 01824
aecom.com

Sean Maxwell
AECOM
250 Apollo Dr.
Chelmsford, Ma 01824

U.S. Fish and Wildlife Service
Attn: David Simmons
New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301

July 26, 2018

Re: Project Review Request, Bourne Stormwater MS4 NOI, Bourne, MA, 05E1NE00-2018-SLI-2527

We have reviewed the referenced project using the Environmental Protection Agency's (EPA) project review process for our Municipal Separate Storm Sewer System (MS4) and have followed provided guidance and instructions in completing the review. We completed our review on July 26, 2018 and are submitting our project package in accordance with the instructions for further review. The U.S. Fish and Wildlife Service's (Service) Information for Planning and Consultation (IPaC) species list indicated these species may be present in the project area: northern long-eared bat (*Myotis septentrionalis*), piping plover (*Charadrius melodus*), roseate tern (*Sterna dougallii dougallii*), and Plymouth redbelly turtle (*Pseudemys rubriventris bangsi*). We are submitting this letter as a non-Federal representative of the EPA pursuant to the requirements of the EPA's process for NPDES/MS4 permits.

Our proposed action consists of: permitting of stormwater utilities and associated allowable discharges, improved stormwater management through: public outreach and participation, illicit discharge detection and elimination, construction site erosion and sedimentation control, post construction stormwater management, good housekeeping, and actions to reduce pollutants to impaired waters.

The location action area is identified on the enclosed map that shows the land area within the Town of Bourne that is regulated under the Massachusetts 2016 Small MS4 permit.

Permit implementation will begin in the fall of 2018 and the permit has an expiration date of June 30, 2022.

This is a request for review by the Service pursuant to section 7 of the Endangered Species Act. EPA has determined that our proposed action will have no effect on the northern long-eared bat because clearing trees is not part of our stormwater program. We determined that the project may affect, but is not likely to adversely affect the other above listed species, because:

- Discharges from the project may reach the estuarine and shoreline environments used by the piping plover. However the project will implement BMPs to reduce pollutants to the

extent that the discharges are not known to have measureable impacts on piping plover, their habitat, or the food they eat.

- Although discharges from the project may reach the marine environment used by the roseate tern, the project will implement BMPs to reduce pollutants to the extent that the discharges are not known to have measureable impacts on roseate terns, their habitat, or the fish they eat.
- The range of Plymouth redbelly turtle within the Bourne limits is mapped as the area north of the Cape Cod Canal. This area overlaps with the area regulated by this permit in the most urbanized portion of the area of Bourne (see attached locus map). The Plymouth redbelly turtle can be found in ponds and rivers. There are two small ponds (Queen Sewell Pond and Bourne Pond) within the regulated area and a stream (Herring River) that is adjacent to the regulated area that receive stormwater from Bourne's MS4. These waterbodies are mostly surrounded by developed residential and commercial land. The project area occurs only in urbanized areas, where less upland habitat for the Plymouth redbelly turtle remains. Although discharges from the project may reach the freshwater pond environments that may be used by the Plymouth redbelly turtle, the project implements BMPs to reduce pollutants to the extent that the discharges are not known to have measureable impacts on Plymouth redbelly turtle, their habitat, or the food they eat. Bourne will consider prioritizing retrofits in areas that drain to ponds and streams in the turtle's range.

The enclosed project package provides the information about the species and/or critical habitat considered in our review, and we identified our determinations for the resources that may be affected by the project. We request you concur with our determination that the project may affect, but is not likely to adversely affect the species described above.

For additional information, please contact Sean Maxwell at the address listed above, by phone at (603) 674-0625, or Sean.Maxwell@aecom.com.

Kind regards,

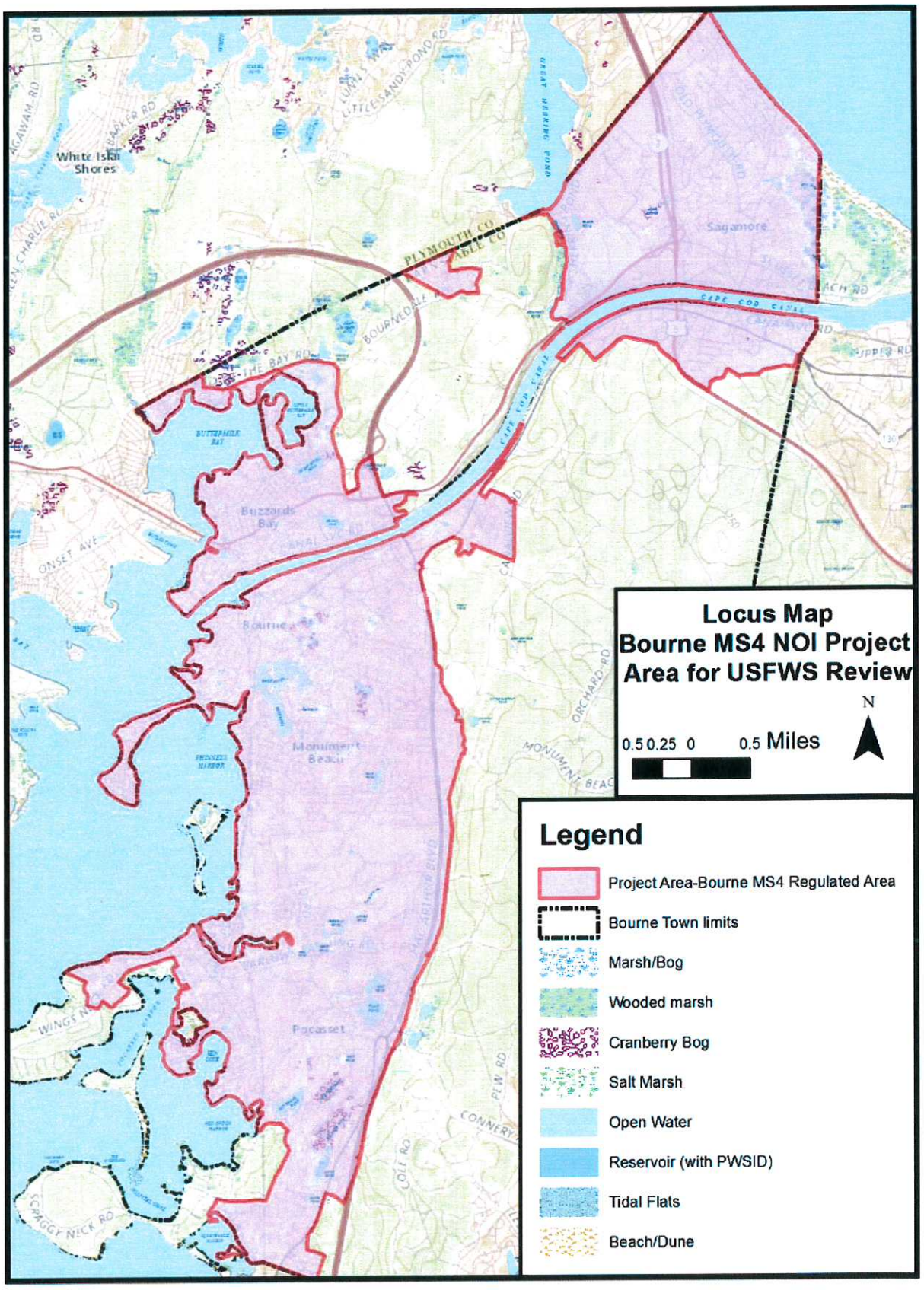
Sean Maxwell
Environmental Scientist IV
AECOM
T: 978-905-3141
M: 603-674-0625
E: Sean.Maxwell@aecom.com

Enclosures:

1) Locus Map of Action Area

2) IPaC Official Species List

3) Species profiles and fact sheets for listed species


Locus Map
Bourne MS4 NOI Project
Area for USFWS Review
N
0.5 0.25 0 0.5 Miles
Legend
Project Area-Bourne MS4 Regulated Area
Bourne Town limits
Marsh/Bog
Wooded marsh
Cranberry Bog
Salt Marsh
Open Water
Reservoir (with PWSID)
Tidal Flats
Beach/Dune
White Island Shores
Sagamore
Buzzards Bay
Monument Beach
Pocasset
PLYMOUTH CO
CAPE COD CANAL
BOURNEDALE
ONSET AVE
ORCHARD RD
MONUMENT BEACH
SCRAGGY NECK RD
CONNERY

Official Species List

United States Department of the Interior

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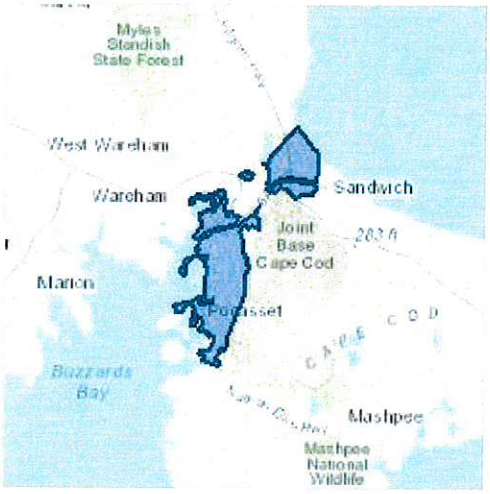

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Roseate Tern *Sterna dougallii dougallii* Population: northeast U.S. nesting pop. No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered

Reptiles

NAME	STATUS
Plymouth Redbelly Turtle *Pseudemys rubriventris bangsi*	Endangered

There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/451

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Piping Plover ECOS Profiles & Fact Sheet

U.S. Fish & Wildlife Service

ECOS

ECOS / Species Profile for Piping Plover (Charadrius melodus)

Piping Plover (Charadrius melodus)

Range Information | Federal Register | Recovery | Critical Habitat | Conservation Plans | Petitions | Life History

Taxonomy: View taxonomy in ITIS

Listing Status: Endangered and **Threatened**

General Information

Size: 18 cm (7.25 in) in length. Color: Breeding season: Pale brown above, lighter below; black band across forehead; bill orange with black tip; legs orange; white rump. Male: Complete or incomplete black band encircles the body at the breast. Female: Paler head band; incomplete breast band. Winter coloration: Bill black; all birds lack breast band and head band.

The species historical range included Alabama, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Puerto Rico, Rhode Island, South Carolina, South Dakota, Texas, Virginia, Virgin Islands, Wisconsin, Wyoming. See below for information about where the species is known or believed to occur.

Population detail

The FWS is currently monitoring the following populations of the Piping Plover

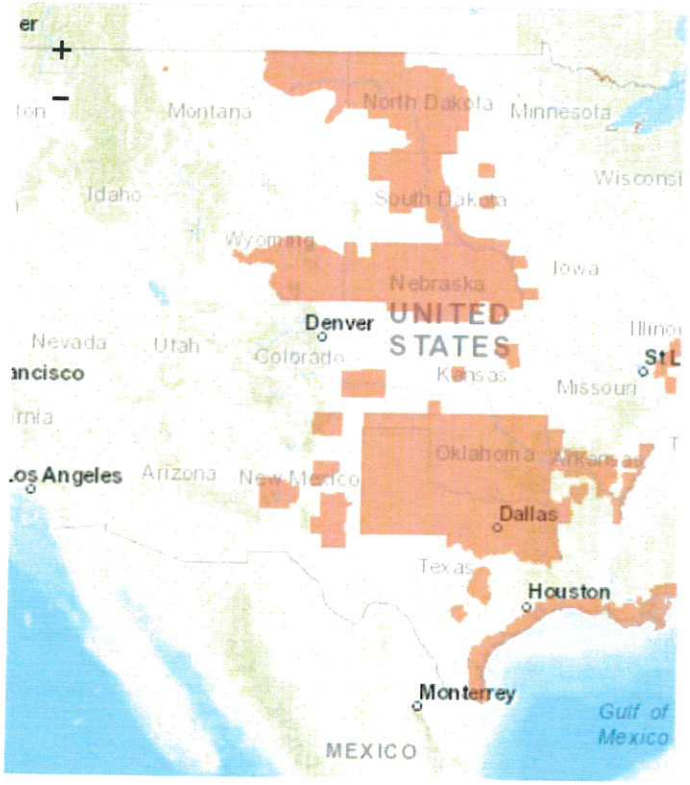
Current Listing Status Summary

Status	Date Listed	Lead Region	Where Listed
Endangered	12/11/1985	Great Lakes-Big Rivers Region (Region 3)	[Great Lakes watershed DPS] - Great Lakes, watershed in States of IL, IN, MI, MN, NY, OH, PA, and WI and Canada (Ont.)
Threatened	12/11/1985	Northeast Region (Region 5)	[Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered.

» Range Information

Current Range

- ☑ *[Great Lakes watershed DPS] - Great Lakes, watershed in States of IL, IN, MI, MN, NY, OH, PA, and WI and Canada (Ont.)*
- ☑ *[Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered.*



Zoom in! Some species' locations may be small and hard to see from a wide perspective. To narrow-in on locations, check the state and county lists (below) and then use the zoom tool.

Want the FWS's current range for all species? Click here to download a zip file containing all individual shapefiles and metadata for all species.

- **[Great Lakes watershed DPS] - Great Lakes, watershed in States of IL, IN, MI, MN, NY, OH, PA, and WI and Canada (Ont.)**

  Listing status: Endangered

  - **States/US Territories** in which this population is known to or is believed to occur: Illinois , Indiana , Michigan , Minnesota , New York , Ohio , Pennsylvania , Wisconsin
  - **US Counties** in which this population is known to or is believed to occur: View All
  - **USFWS Refuges** in which this population is known to occur: Blackbeard Island National Wildlife Refuge, Cabo Rojo National Wildlife Refuge, Fergus Falls Wetland Management District, ... Show All Refuges
  - **Countries** in which this population is known to occur: Canada, United States

- **[Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered.**

  Listing status: Threatened

  - **States/US Territories** in which this population is known to or is believed to occur: Alabama , Arkansas , Colorado , Delaware , Florida , Georgia , Iowa , Kansas , Louisiana , Maine , Maryland , Mississippi , Montana , Nebraska , New Jersey , New Mexico , New York , North Carolina , North Dakota , Oklahoma , Rhode Island , South Carolina , South Dakota , Texas , Virginia , Wyoming
  - **US Counties** in which this population is known to or is believed to occur: View All
  - **USFWS Refuges** in which this population is known to occur: Amagansett National Wildlife Refuge, Anahuac National Wildlife Refuge, Aransas National Wildlife Refuge, ... Show All Refuges
  - **Countries** in which this population is known to occur: Canada, Mexico, United States

» Federal Register Documents

Federal Register Documents

Show 10 entries

Date	Citation Page	Title
03/16/2016	81 FR 14121 14122	ETWP; Draft Revised Recovery Plan for the I
01/21/2016	81 FR 3450	Draft Environmental Assessment, Habitat Co Piping Plover, Massachusetts Division of Fish
07/08/2014	79 FR 38560 38562	Initiation of 5-Year Status Reviews of Nine Li
09/08/2011	76 FR 55638 55641	90-Day Finding on a Petition To List the Snov
05/19/2009	74 FR 23476 23600	Revised Designation of Critical Habitat for the Texas
10/21/2008	73 FR 62816 62841	Revised Designation of Critical Habitat for the North Carolina; Final Rule
09/30/2008	73 FR 56860 56862	Endangered and Threatened Wildlife and Pla information on the piping plover (Charadrius
06/09/2008	73 FR 32629	Correction to Revised Designation of Critical melodus) in Texas
05/20/2008	73 FR 29294 29321	Revised Designation of Critical Habitat for the Texas; Proposed rule

Showing 1 to 10 of 32 entries ‹ Previous 1 2 3 4 Next ›

» Recovery

- Recovery Plan Information Search
- Information Search FAQs

Current Recovery Plan(s)

Show 10 entries

Date	Title
03/16/2016	Volume II: Draft revised recovery plan for the wintering range of the piping plover (Charadrius melodus) and Comprehensive conservatic piping plover (Charadrius melodus) in its coastal migration and wint continental United States.
03/16/2016	Volume I: Draft Revised Recovery Plan for the Northern Great Plain (Charadrius melodus)
09/08/2003	Recovery Plan for the Great Lakes population of Piping Plovers
05/02/1996	Piping Plover Atlantic Coast Population Revised Recovery Plan

Showing 1 to 4 of 4 entries

< Previous 1 Next >

Other Recovery Documents

Show 10 entries

Date	Citation Page	Title
03/16/2016	81 FR 14121 14122	ETWP; Draft Revised Recovery Plan for the I
07/08/2014	79 FR 38560 38562	Initiation of 5-Year Status Reviews of Nine Li Species
09/30/2008	73 FR 56860 56862	Endangered and Threatened Wildlife and Pla review; request for information on the piping
09/16/2003	68 FR 54241 54242	Approved Recovery Plan for the Great Lakes

Showing 1 to 8 of 8 entries ‹ Previous 1 Next ›

Five Year Review

Show 10 entries

Date	Title
09/29/2009	Piping Plover (Charadrius melodus) 5-Year Revie

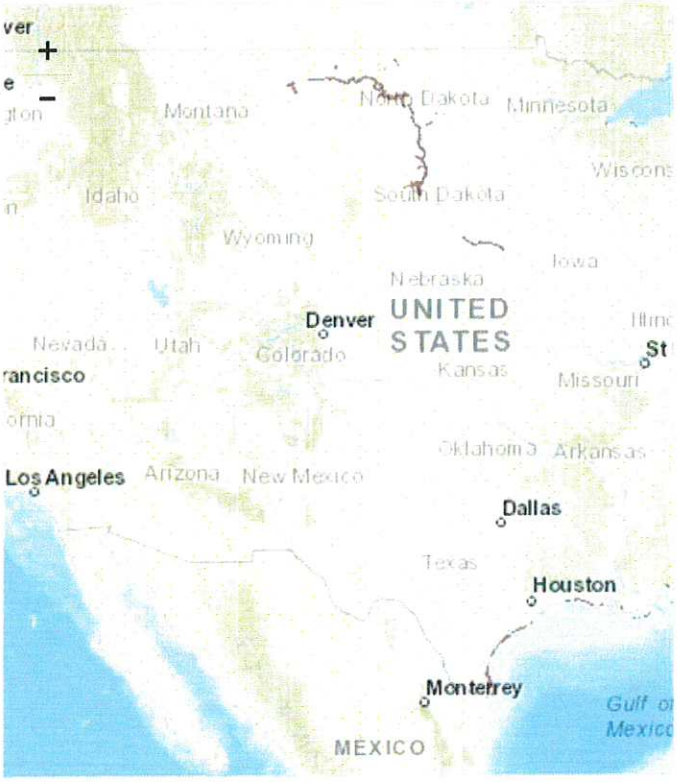
Showing 1 to 1 of 1 entries ‹ Previous 1 Next ›

» Critical Habitat

Critical Habitat Spatial Extents

Population(s)

- [Great Lakes watershed DPS] - Great Lakes, watershed in States of IL, IN, MI, MN, NY, OH, PA, and WI and Canada (Ont.)
- [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered.



Show 10 entries

Date	Citation Page	Title

05/19/2009	74 FR 23476 23600	Revised Designation of Critical Habitat for the Plover (Charadrius melodus) in Texas
10/21/2008	73 FR 62816 62841	Revised Designation of Critical Habitat for the Plover (Charadrius melodus) in North Carolin
05/20/2008	73 FR 29294 29321	Revised Designation of Critical Habitat for the Plover (Charadrius melodus) in Texas: Propo
09/11/2002	67 FR 57638 57717	Endangered and Threatened Wildlife and Pla for the Northern Great Plains Breeding Popul
12/28/2001	66 FR 67165 67166	ETWP; Proposed Designation of Critical Hab Breeding Population of the Piping Plover; Re and Notice of Availability of Draft Economic A
07/10/2001	66 FR 36137 36143	ETWP; Final Determination of Critical Habitat 36137-36143)

Showing 1 to 10 of 12 entries

< Previous 1 2 Next >

To learn more about critical habitat please see http://ecos.fws.gov/crithab

» Conservation Plans

Habitat Conservation Plans (HCP) (learn more)

Show 10 entries

HCP Plan Summaries
Volusia Beaches
Town of Orlean's Plover Low Effect HCP
Piping Plover HCP (State of Massachusetts)
Magic Carpet Woods Association
Escambia County Beaches

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» Petitions

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» Life History

No Life History information has been entered into this system for this species.

» Other Resources

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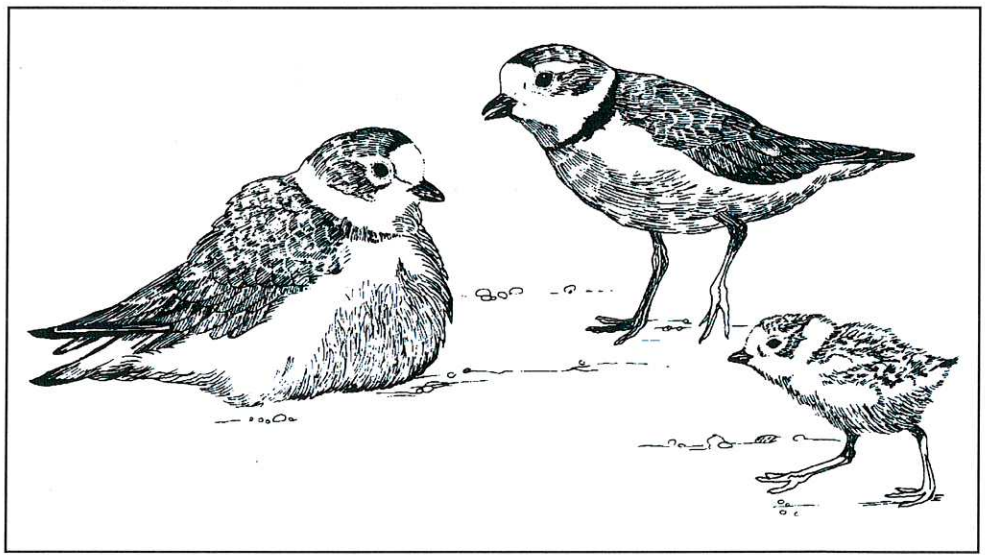
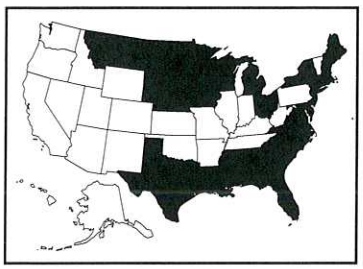
ITIS Reports -- ITIS (the Integrated Taxonomic Information System) is a source for authoritative taxonomic information on plants, animals, fungi, and microbes of North America and the world.

FWS Digital Media Library -- The U.S. Fish and Wildlife Service's National Digital Library is a searchable collection of selected images, historical artifacts, audio clips, publications, and video.

U.S. Fish & Wildlife Service

Endangered Species Facts





States in which the piping plover is found. This map includes both summer and winter locations.

Piping Plover

The piping plover in the Great Lakes area is an *endangered species.* Endangered species are animals and plants that are in danger of becoming extinct. The Northern Great Plains and Atlantic Coast piping plovers are *threatened species.* Threatened species are animals and plants that are likely to become endangered in the foreseeable future. Identifying, protecting, and restoring endangered and threatened species is the primary objective of the U.S. Fish and Wildlife Service's endangered species program.

What is the Piping Plover?

Scientific Name - *Charadrius melodus*

Appearance - These small, stocky shorebirds have a sand-colored upper body, a white underside, and orange legs. During the breeding season, adults have a black forehead, a black breast band, and an orange bill.

Habitat - Piping plovers use wide, flat, open, sandy beaches with very little grass or other vegetation. Nesting territories often include small creeks or wetlands.

Reproduction - The female lays four eggs in its small, shallow nest lined with pebbles or broken shells. Both parents care for the eggs and chicks. When the chicks hatch, they are able to run about and feed themselves within hours.

Feeding Habits - The plovers eat insects, spiders, and crustaceans.

Range - Piping plovers are migratory birds. In the spring and summer they breed in the northern United States and Canada. There are three locations where piping plovers nest in North America: the shorelines of the Great Lakes, the shores of rivers and lakes in the Northern Great Plains, and along the Atlantic Coast. Their nesting range has become smaller over the years, especially in the Great Lakes area. In the fall, plovers migrate south and winter along the Gulf Coast or other southern locations.

The Great Lakes population of the piping plover is at a perilously low level. Since 1983, the number of nesting pairs has ranged from 12 to 32. In 2000, all of the Great Lakes pairs nested in Michigan.

Why is the piping plover endangered?

Habitat Loss or Degradation - Many of the coastal beaches traditionally used by piping plovers for nesting have been lost to commercial, residential, and recreational developments. Through the use of dams or other water control structures, humans are able to raise and lower the water levels of many lakes and rivers of plover inland nest sites. Too much water in the spring floods the plovers' nests. Too little water over a long period of time allows grasses and other vegetation to grow on the prime nesting beaches, making these sites unsuitable for successful nesting.

Nest Disturbance and Predation - Piping plovers are very sensitive to the presence of humans. Too much disturbance causes the parent birds to abandon their nest. People (either on foot or in a vehicle) using the beaches where the birds nest sometimes accidentally crush eggs or young birds. Dogs and cats often harass and kill the birds. Other animals, such as fox, gulls, and crows, prey on the young plovers or eggs.

What is being done to prevent extinction of the piping plover?

Listing - The Great Lakes population of the piping plover was listed as an endangered species in 1986, and the Northern Great Plains and Atlantic Coast populations were listed as threatened species that same year.

Recovery Plans - The U.S. Fish and Wildlife Service developed recovery plans that describe actions that need to be taken to help the bird survive and recover.

Research - Several cooperative research groups have been set up among federal and state agencies, university and private research centers, and the Canadian Wildlife Service. Studies are being conducted to determine where plovers breed and winter, estimate numbers, and monitor long-term changes in populations.

Habitat Protection - Measures to protect the bird's habitat are conducted each year (often by volunteers), including controlling human access to nesting areas, nest monitoring and protection, limiting residential and industrial development, and properly managing water flow. In Michigan, several landowners have formally agreed to protect plover nesting habitat.

Public Education - Many states and private agencies are running successful public information campaigns to raise awareness of the plover's plight. In Michigan, residents of coastal communities where the birds nest have been contacted by an "ambassador" and provided with information about the plight of the plover.

What can I do to prevent the extinction of species?

Learn - Learn more about the piping plover and other endangered and threatened species. Understand how the destruction of habitat leads to loss of endangered and threatened species and our nation's plant and animal diversity. Tell others about what you have learned.

Volunteer - If piping plovers live near you, join the "Plover Patrol" (information about the "Plover Patrol" is on the website to the right). Or volunteer your time at a nearby Nature Center, Wildlife Sanctuary or National Wildlife Refuge. Make sure you control pets, and always remove litter on beaches. Encourage others to do the same.

U.S. Fish & Wildlife Service
1 Federal Drive
Fort Snelling, Minnesota 55111
612/713-5337
http://midwest.fws.gov/eco_serv/endangrd

Roseate Tern ECOS Profiles & Fact Sheet

Endangered Species

Endangered, Threatened and Special Concern Species in Connecticut

Species Fact Sheets

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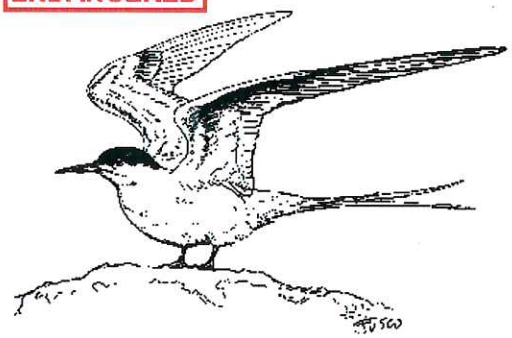
Regulations of CT State Agencies

ROSEATE TERN
Sterna dougallii

ENDANGERED



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Habitat: Strictly saltwater coastlines; almost never seen inland.
Weight: Approximately 4 ounces.
Length: 14-17 inches.
Wingspan: 30 inches.
Life Expectancy: Banding indicates 9 years of age.
Food: Small fish, occasionally mollusks.
Status: Federally and state endangered.

Identification: Adults have a white body and black head cap. The deeply forked tail measures 6 to 8 inches in length. The black bill is red at the base, varying with the season and the age of the bird; as the breeding season progresses from incubation to the care and feeding of chicks, more and more of the base turns pinkish-red. The rosy tint on the breast is rarely visible in summer, but the bird's bright orange-red legs and feet are easy to distinguish. Both sexes are similar. Chicks and fledglings have black bills, legs and feet. The voice is a high-pitched, rasping "aaak" and soft "chivy."

Range: Roseate terns nest in colonies on sand/gravel beaches or pebbly/rocky offshore islands along the Atlantic coast from Nova Scotia south to Long Island, New York, and on the southern tip of Florida. Roseates that nest in the northeastern United States appear to winter primarily in the waters off Trinidad and northern South America from the Pacific coast of Columbia to eastern Brazil.

Reproduction: Roseate terns arrive in Connecticut in late April and early May. The first eggs are laid by the third week of May in shallow scrapes, or depressions, sometimes lined with dried vegetation. Nests are often concealed by vegetation or rocks. The 1 to 2 eggs are pale buff with small dots of brown. The adults take turns incubating the eggs and bringing small fish to the chicks. The eggs hatch in 23 to 24 days, and the young fledge about 26 to 30 days after hatching. Birds that lose their nests or young will produce new nests into late July and occasionally into early August. Roseate terns usually breed and nest at 3 years of age.

Reason for Decline: Historically, the roseate tern population suffered losses due to the millinery trade. Roseate tern productivity has also been affected by increased human recreation and disturbance in coastal areas, as well as by predation by great black-backed and herring gulls, owls and nocturnal-feeding mammals. Increasing numbers of gulls and human activity on or near coastal barrier islands have greatly reduced available nesting habitat for the roseate tern population in northeastern North America. Many traditional nesting sites in southern New England were abandoned during the 1940s and 1950s when great black-backed and herring gulls rapidly expanded their nesting ranges. These large, aggressive gulls stake out nesting territories in early spring before the terns return from their wintering areas. Gulls have taken over most of the outer islands preferred by nesting terns.

History in Connecticut: In the late 1800s, unrestricted market hunting for the millinery trade devastated the roseate tern population on the Atlantic coast. After harvest for commercial purposes was prohibited by law, the population recovered and at times equaled the number of common terns. Roseate tern numbers declined again in the 1970s and 1980s when gull populations increased.

The third largest roseate tern colony in North America exists in Connecticut at Falkner Island, which is now part of the Stewart B. McKinney National Wildlife Refuge. Approximately 175 to 200 pairs of terns breed there every year. This population has been studied in detail since 1978. Other colony sites that have been used in

Connecticut during 1989 include Tuxis Island near Madison and Duck Island near Clinton. Several small islands in the New London area were occupied by roseate terns in the 1970s.

Approximately one-fourth of the roseate tern breeding population in a given year at Falkner Island does not return the following year. Presently, it is not known if this loss is due to mortality or emigration to other colony sites.

Interesting Facts: According to the U.S. Fish and Wildlife Service (USFWS), islands with manned lighthouses were favorite nesting areas for roseates because the human presence deterred large gulls from nesting. Since the automation of almost all lighthouses, gulls have moved in and displaced the terns. The USFWS officially listed the northeastern breeding population of the roseate tern as endangered in December, 1987.

Adult terns are mainly preyed on by avian species such as owls, gulls and raptors. Eggs and young are also vulnerable to predation, as well as to adverse weather conditions and disturbance. Predation may completely wipe out production in a given colony. The combination of adult mortality, delayed maturity and low productivity can, in a short time, result in serious population declines unless they are offset by subsequent years of high productivity.

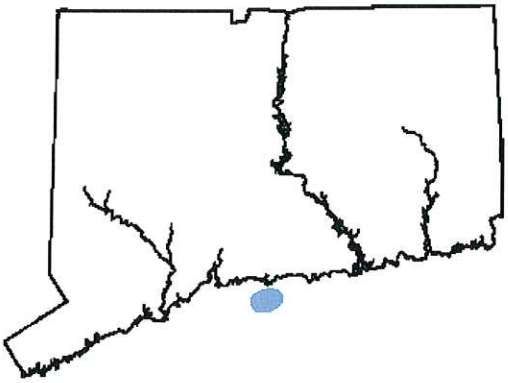
Roseate terns catch their prey by diving headfirst into the water. Their diet of small fish may have led to the alias mackerel gull, which also reflects their membership in the gull family. Graceful tern was another common name given to this adept flier.

In 1975, studies on Gull Island, New York, reported the hybridization of common terns and roseate terns. Similar crosses have not been documented since.

Protective Legislation: *Federal* - Endangered Species Act of 1973, Migratory Bird Treaty Act of 1918. *State* - Connecticut General Statutes Sec. 26-311.

What You Can Do: Respect all roseate tern nesting areas that are fenced or posted for the birds' protection. Do not approach or linger near roseate terns or their nests. Avoid landing vessels at offshore islands inhabited by terns.

Connecticut Range



The production of this Endangered and Threatened Species Fact Sheet Series is made possible by donations to the Endangered Species-Wildlife Income Tax Checkoff Fund.
(rev. 12/99)

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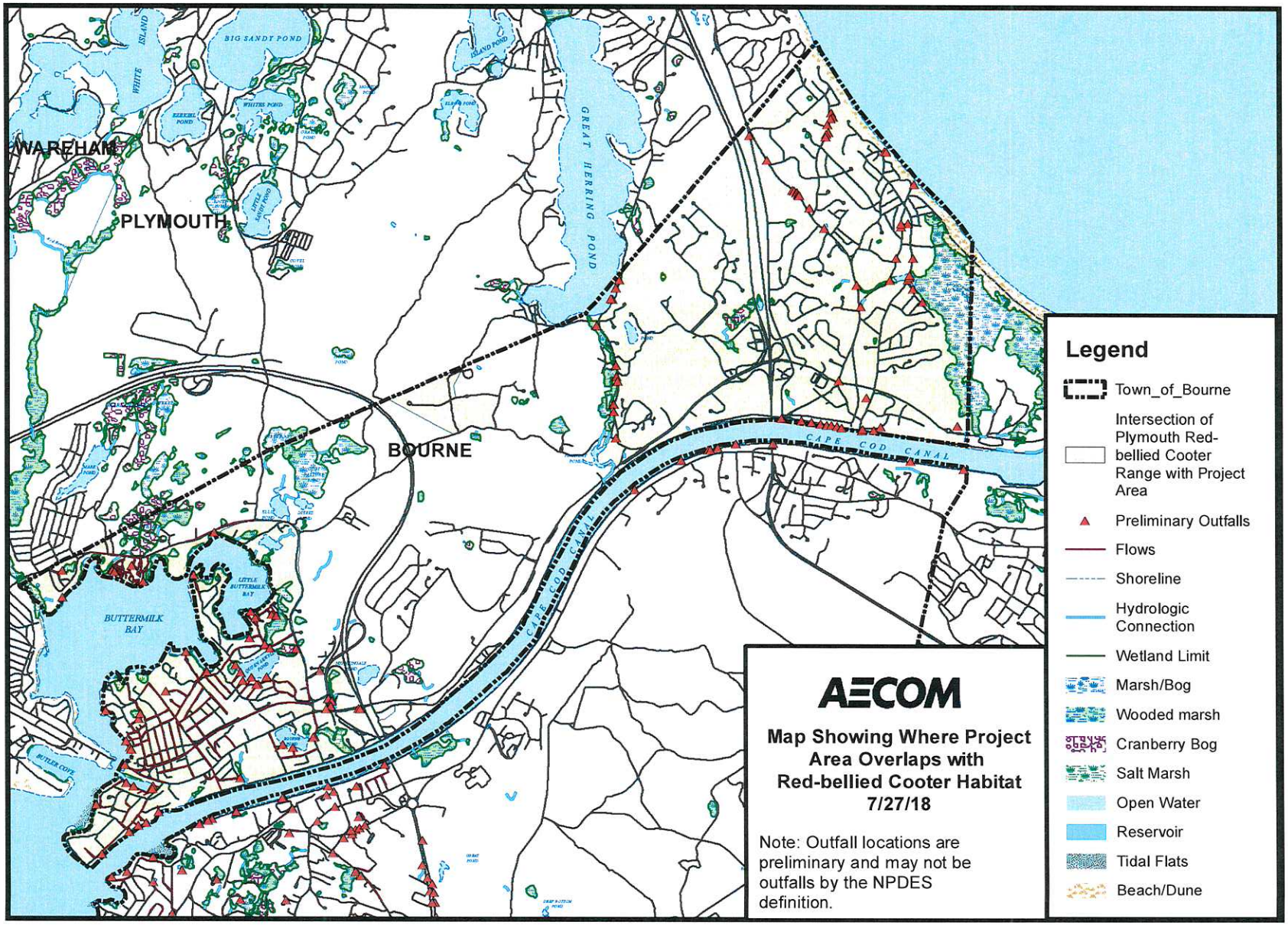
Plymouth Redbelly Turtle ECOS Profiles & Fact Sheet


WAREHAM
PLYMOUTH
BOURNE
BIG SANDY POND
WHITE ISLAND
ISLAND POND
GREAT HERRING POND
CAPE COD CANAL
BUTTERMILK BAY
LITTLE BUTTERMILK BAY
BUTLER COVE
Legend
Town_of_Bourne
Intersection of Plymouth Red-bellied Cooter Range with Project Area
Preliminary Outfalls
Flows
Shoreline
Hydrologic Connection
Wetland Limit
Marsh/Bog
Wooded marsh
Cranberry Bog
Salt Marsh
Open Water
Reservoir
Tidal Flats
Beach/Dune
AECOM
Map Showing Where Project Area Overlaps with Red-bellied Cooter Habitat
7/27/18
Note: Outfall locations are preliminary and may not be outfalls by the NPDES definition.

U.S. Fish & Wildlife Service

ECOS

ECOS / Species Profile for Plymouth redbelly Turtle (Pseudemys rubriventris bangsi)

Plymouth Redbelly Turtle (Pseudemys rubriventris bangsi)

Search for images on digitalmedia.fws.gov

Range Information | Federal Register | Recovery | Critical Habitat | Conservation Plans | Petitions | Life History

Taxonomy: View taxonomy in ITIS

Listing Status: Endangered

Where Listed: WHEREVER FOUND

General Information

10-15 3/4" (25.4-40 cm). Carapace brown to black with flattened or slightly concave vertebral scutes; red bar on each marginal scute. Prominent notch at tip of upper jaw flanked by toothlike cusps; arrow-shaped stripe runs atop head, between eyes, to snout. Plastron reddish; dark markings along scute seams fade with age. Male has elongated, straight claws on front feet.

The species historical range included Massachusetts. See below for information about where the species is known or believed to occur.

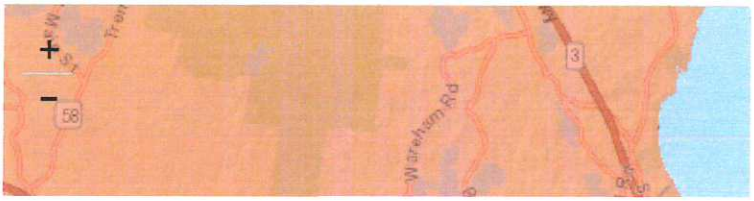
Current Listing Status Summary

Status	Date Listed	Lead Region	Where Listed
Endangered	04/02/1980	Northeast Region (Region 5)	Wherever found

» Range Information

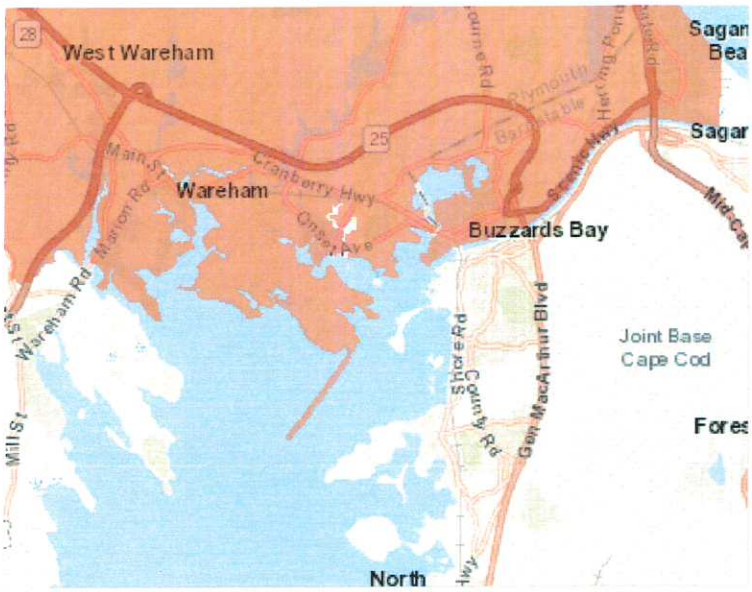
Current Range

☑ *Wherever found*



Zoom in! Some species' locations may be small and hard to see from a wide perspective. To narrow-in on locations, check the state and county lists (below) and then use the zoom tool.

Want the FWS's current range for all species? Click here to download a zip file containing all individual shapefiles and metadata for all species.



- **Wherever found**

  Listing status: Endangered

  - **States/US Territories** in which this population is known to or is believed to occur: Massachusetts
  - **US Counties** in which this population is known to or is believed to occur: View All
  - **USFWS Refuges** in which this population is known to occur: Massasoit National Wildlife Refuge

» Federal Register Documents

Federal Register Documents

Show 10 entries

Date	Citation Page	Title
10/03/2006	71 FR 58363 58364	Endangered and Threatened Wildlife and Plants; 90-D (Pseudemys rubriventris bangsi)
04/21/2006	71 FR 20717 20718	Initiation of a 5-Year Review of Nine Listed Species: th clava), Northern Red-bellied Cooter (Pseudemys rubri (Helonias bullata), Northern Riffleshell (Epioblasma to (Triodopsis platysayoides), Puritan Tiger Beetle (Cicin heterodon)
04/02/1980	45 FR 21828 21833	ETWP; Listing as Endangered With Critical Habitat for
09/13/1979	44 FR 53422 53424	ETWP; Reproposal of Critical Habitat for the Plymouth

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» Recovery

- Recovery Plan Information Search
- Information Search FAQs

Current Recovery Plan(s)

Show 10 entries

Date	Title	Plan Action Status
05/06/1994	Plymouth Redbelly Turtle	View Implementation

Showing 1 to 1 of 1 entries ‹ Previous 1 Next ›

Other Recovery Documents

Show 10 entries

Date	Citation Page	Title
04/21/2006	71 FR 20717 20718	Initiation of a 5-Year Review of Nine Listed Species: th perpurpurea), Clubshell (Pleurobema clava), Northern rubriventris bangsi), Roanoke Logperch (Percina rex), Northern Riffleshell (Epioblasma torulosa rangiana), F Snail (Triodopsis platysayoides), Puritan Tiger Beetle (Wedgemussel (Alasmidonta heterodon)

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Five Year Review

Show 10 entries

Date	Title
09/10/2007	Northern Red-Bellied Cooter 5-Year Review

Showing 1 to 1 of 1 entries

‹ Previous 1 Next ›

» Critical Habitat

Critical Habitat Spatial Extents

Population(s)

☑ *Wherever found*

Show 10 ▾ entries

Date	Citation Page	Title
04/02/1980	45 FR 21828 21833	ETWP; Listing as Endangered With Critical Habitat for Turtle in Massachusetts
09/13/1979	44 FR 53422 53424	ETWP; Reproposal of Critical Habitat for the Plymouth
05/19/1978	43 FR 21702 21705	Proposed Endangered Status and Critical Habitat for mud turtle and Plymouth red-bellied turtle);

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To learn more about critical habitat please see http://ecos.fws.gov/crithab

» Conservation Plans

No conservation plans have been created for Plymouth redbelly Turtle.

» Petitions

Show 10 ▼ entries

Showing 1 to 1 of 1 entries

‹ Previous 1 Next ›

» Life History

No Life History information has been entered into this system for this species.

» Other Resources

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U.S. Fish & Wildlife Service

Northern red-bellied cooter

Pseudemys rubriventris

One of the challenges an animal or plant can face is separation from others of its type. In Massachusetts, a native freshwater turtle – the northern red-bellied cooter – lives more than 250 miles from the rest of the species, which lives along the coast in southern New Jersey, Delaware, Maryland, Virginia and North Carolina. As an ecologically and geographically distinct population, the northern red-bellied cooter faces difficult odds; its small population size and limited range can hinder its long-term survival. This turtle received Endangered Species Act protection in 1980 and is considered endangered.

USFWS

Northern red bellied cooter

Northern red-bellied cooters today live in just one county in Massachusetts, but archaeological data indicate that northern red-bellied cooters likely lived farther to the north, south and west in pre-colonial times. Additionally, data from prehistoric Indian middens in New England suggest that humans used cooters for food, perhaps causing local extinctions.

In more recent times, environmental pressures have challenged turtle survival. Extensive residential and agricultural development has altered its coastal plain pond habitat. Development, roads and stream channel alteration have fragmented habitat, eliminating many of the natural movement corridors between ponds. Such habitat modifications are a large part of the northern red-bellied cooter's predicament.

Life as a cooter

With an adult size of 10 to 12 inches and weighing up to 10 pounds, the northern red-bellied cooter is larger than most freshwater turtles except the snapping turtle. Females are larger than males, and the two sexes are differently patterned and colored. Females reach sexual maturity at 15 to 20 years; that timing may be somewhat less for males.

In late spring and early summer, females select nesting sites in sandy soil, usually within 100 yards of a pond, though some females travel even greater distances in search of suitable nesting sites. Warmth from the sun and other temperature conditions at cooter nest sites can affect the sex ratio of hatchlings; cool nests will produce more males, while warm nests produce more females.

The nest's five to 17 eggs incubate for up to 80 days. Hatchlings may emerge from nests to enter ponds in late summer, or they may overwinter in the nest chamber and emerge the following spring.

Life is uncertain for cooter eggs and small hatchlings. Skunks and raccoons eat eggs and hatchlings in the nest. Bull frogs will eat hatchlings; herons, snapping turtles and introduced predatory fish may also eat them. Nearly 100 percent of northern red-bellied cooter hatchlings do not survive their first year.

A head start for turtle babies

Because hatchling survival is essential to building and maintaining a breeding population, biologists have established a headstarting program. When a nest is found, it is screened to prevent disturbance by predators. When it is time for the eggs to hatch, biologists revisit the nest and take half the hatchling turtles into captivity, where they are kept warm and fed on demand for about eight months. The nest's remaining hatchlings are released directly into their birth pond. The aquarium-residing headstarted hatchlings grow rapidly to become two to six times the size of similar-aged turtles in the wild. Survival of hatchling turtles in captivity is high, as is survival of released headstarted hatchlings, which are too large for most predators to kill and eat. Young headstarted turtles are returned to new pond and river habitats to expand existing populations. The turtles remain faithful to their release pond territory. Headstarted turtles have been found alive and healthy a dozen years after returning to the wild.

It's all about the habitat

While headstarting is an important part of the recovery strategy for northern red-bellied cooter, the strategy's emphasis is on habitat protection. Changes in land use have caused loss of nesting and basking sites. In the past, fires frequently burned the pine barren habitat occupied by this turtle, leaving

openings in the mixed pine and oak forest. For 100 years, the area has been protected from fire; allowing most of the remaining undeveloped areas to grow into closed-canopy pine forest. With these closed-canopy forests surrounding most ponds, suitable nesting habitat with adequate heating from the sun for incubation is scarce.

Biologists are clearing overhanging vegetation from nesting sites to provide sunnier conditions at ponds where red-bellied cooters lay their eggs. Opening vegetation at beaches close to ponds will provide additional nesting opportunities. Trees removed to expose nesting beaches to sunlight can be anchored in shallow water to provide additional basking sites.

In some locations, cranberry growers incidentally maintain open spaces suitable as nesting habitat, and the turtles seek out these locations. Cranberry growers have cooperated in research and recovery efforts for this endangered turtle in many ways, among them granting biologists access to private lands and alerting employees to watch for turtles and nests.

What's to be done?

With nest protection and headstarting, the number of northern red-bellied cooters is believed to have doubled since 1980. But we need to learn more. Little is known about the effect of pesticides or other agricultural chemicals on northern red-bellied cooters. The same is true for heavy metals or other contaminants. Even though this turtle has been studied for over 100 years, intensively for the past 30, we still do not fully understand what limits the northern red-bellied cooter's distribution to just a handful of coastal ponds. Most likely, a combination of factors is affecting the cooter. Some we do know – the turtle's late maturation, low reproductive rate and the loss of coastal pond habitat. Some we guess at – perhaps the number of nest and hatchling predators has increased, or an introduced aquatic species is devastating the turtle at a vulnerable life stage.

We do know that the cooperation of the private landowners, the state of Massachusetts and the U.S. Fish and Wildlife Service is crucial to continuing the northern red-bellied cooter's slow and steady climb away from extinction.

U.S. Fish & Wildlife Service
300 Westgate Center Drive
Hadley, MA 01535

Federal Relay Service
for the deaf and hard-of-hearing
1 800/877 8339

U.S. Fish & Wildlife Service
1 800/344 WILD
http://www.fws.gov

August 2006

Northern Long-eared Bat Fact Sheet

Northern Long-Eared Bat

Myotis septentrionalis

The northern long-eared bat is federally listed as a threatened species under the Endangered Species Act. ***Endangered*** species are animals and plants that are in danger of becoming extinct. ***Threatened*** species are animals and plants that are likely to become endangered in the foreseeable future. Identifying, protecting and restoring endangered and threatened species is the primary objective of the U.S. Fish and Wildlife Service's Endangered Species Program.

Photo by Steve Taylor; University of Illinois

This northern long-eared bat, observed during an Illinois mine survey, shows visible symptoms of white-nose syndrome.

What is the northern long-eared bat?

Appearance: The northern long-eared bat is a medium-sized bat with a body length of 3 to 3.7 inches and a wingspan of 9 to 10 inches. Their fur color can be medium to dark brown on the back and tawny to pale-brown on the underside. As its name suggests, this bat is distinguished by its long ears, particularly as compared to other bats in its genus, *Myotis*.

Winter Habitat: Northern long-eared bats spend winter hibernating in caves and mines, called hibernacula. They use areas in various sized caves or mines with constant temperatures, high humidity, and no air currents. Within hibernacula, surveyors find them hibernating most often in small crevices or cracks, often with only the nose and ears visible.

Summer Habitat: During the summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities or in crevices of both live trees and snags (dead trees). Males and non-reproductive females may also roost in cooler places, like caves and mines. Northern long-eared bats seem to be flexible in selecting roosts, choosing roost trees based on suitability to retain bark or provide cavities or crevices. They rarely roost in human structures like barns and sheds.

Reproduction: Breeding begins in late summer or early fall when males begin to swarm near hibernacula. After copulation, females store sperm during hibernation until spring. In spring, females emerge from their hibernacula, ovulate and the stored sperm fertilizes an egg. This strategy is called delayed fertilization.

After fertilization, pregnant bats migrate to summer areas where they roost in small colonies and give birth to a single pup. Maternity colonies of females and young generally have 30 to 60 bats at the beginning of the summer, although larger maternity colonies have also been observed. Numbers of bats in roosts typically decrease from the time of pregnancy to post-lactation. Most bats within a maternity colony give birth around the same time, which may occur from late May or early June to late July, depending where the colony is located within the species' range. Young bats start flying by 18 to 21 days after birth. Maximum lifespan for the northern long-eared bat is estimated to be up to 18.5 years.

Feeding Habits: Like most bats, northern long-eared bats emerge at dusk to feed. They primarily fly through the understory of forested areas feeding on moths, flies, leafhoppers, caddisflies, and beetles, which they catch while in flight using echolocation or by gleaning motionless insects from vegetation.

Range: The northern long-eared bat's range includes much of the eastern and north central United States, and all Canadian provinces from the Atlantic Ocean west to the southern Yukon Territory and eastern British Columbia. The species' range includes 37 States and the District of Columbia: Alabama, Arkansas, Connecticut, Delaware, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming.

Why is the northern long-eared bat in trouble?

White-nose Syndrome: No other threat is as severe and immediate as

this. If this disease had not emerged, it is unlikely that northern long-eared bat populations would be experiencing such dramatic declines. Since symptoms were first observed in New York in 2006, white-nose syndrome has spread rapidly from the Northeast to the Midwest and Southeast; an area that includes the core of the northern long-eared bat's range, where it was most common before this disease. Numbers of northern long-eared bats (from hibernacula counts) have declined by up to 99 percent in the Northeast. Although there is uncertainty about the rate that white-nose syndrome will spread throughout the species' range, it is expected to continue to spread throughout the United States in the foreseeable future.

Other Sources of Mortality:

Although no significant population declines have been observed due to the sources of mortality listed below, they may now be important factors affecting this bat's viability until we find ways to address WNS.

Impacts to Hibernacula: Gates or other structures intended to exclude people from caves and mines not only restrict bat flight and movement, but also change airflow and microclimates. A change of even a few degrees can make a cave unsuitable for hibernating bats. Also, cave-dwelling bats are vulnerable to human disturbance while hibernating. Arousal during hibernation causes bats to use up their energy stores, which may lead to bats not surviving through winter.

Loss or Degradation of Summer Habitat: Highway construction, commercial development, surface mining, and wind facility construction permanently remove habitat and are activities prevalent in many areas of this bat's range. Many forest management activities benefit bats by keeping areas forested rather than converted to other uses. But, depending on type and timing, some forest management activities can cause mortality and temporarily remove or degrade roosting and foraging habitat.

Wind Farm Operation: Wind turbines kill bats, and, depending on the species, in very large numbers. Mortality from windmills has been documented for northern long-eared bats, although a small number have been found to date. However, there are many wind projects within a large portion of the bat's range and many more are planned.

What Is Being Done to Help the Northern Long-Eared Bat?

Disease Management: Actions have been taken to try to reduce or slow the spread of white-nose syndrome through human transmission of the fungus into caves (e.g. cave and mine closures and advisories; national decontamination protocols). A national plan was prepared by the Service and other state and federal agencies that details actions needed to investigate and manage white-nose syndrome. Many state and federal agencies, universities and non-governmental organizations are researching this disease to try to control its spread and address its affect. See www.whitenosesyndrome.org/ for more.

Addressing Wind Turbine Mortality: The Service and others are working to minimize bat mortality from wind turbines on several fronts. We fund and conduct research to determine why bats are susceptible to turbines, how to operate turbines to minimize mortality and where important bird and bat migration routes are located. The Service, state natural resource agencies, and the wind energy industry are developing a Midwest Wind Energy Habitat Conservation Plan, which will provide wind farms a mechanism to continue operating legally while minimizing and mitigating listed bat mortality.

Listing: The northern long-eared bat is listed as a threatened species under the federal Endangered Species Act. Listing a species affords it the protections of the Act and also increases the priority of the species for funds, grants, and recovery opportunities.

Hibernacula Protection: Many federal and state natural resource agencies and conservation organizations have protected caves and mines that are important hibernacula for cave-dwelling bats.

What Can I Do?

Do Not Disturb Hibernating Bats: To protect bats and their habitats, comply with all cave and mine closures, advisories, and regulations. In areas without a cave and mine closure policy, follow approved decontamination protocols (see http://whitenosesyndrome.org/topics/decontamination). Under no circumstances should clothing, footwear, or equipment that was used in a white-nose syndrome affected state or region be used in unaffected states or regions.

Leave Dead and Dying Trees Standing: Like most eastern bats, the northern long-eared bat roosts in trees during summer. Where possible and not a safety hazard, leave dead or dying trees on your property. Northern long-eared bats and many other animals use these trees.

Install a Bat Box: Dead and dying trees are usually not left standing, so trees suitable for roosting may be in short supply and bat boxes may provide additional roost sites. Bat boxes are especially needed from April to August when females look for safe and quiet places to give birth and raise their pups.

Support Sustainability: Support efforts in your community, county and state to ensure that sustainability is a development goal. Only through sustainable living will we provide rare and declining species, like the northern long-eared bat, the habitat and resources they need to survive alongside us.

Spread the Word: Understanding the important ecological role that bats play is a key to conserving the northern long-eared and other bats. Helping people learn more about the northern long-eared bat and other endangered species can lead to more effective recovery efforts. For more information, visit www.fws.gov/midwest/nleb and www.whitenosesyndrome.org

Join and Volunteer: Join a conservation group; many have local chapters. Volunteer at a local nature center, zoo, or national wildlife refuge. Many state natural resource agencies benefit greatly from citizen involvement in monitoring wildlife. Check your state agency websites and get involved in citizen science efforts in your area.

USFWS Determination Letter

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New England Field Office
70 Commercial St, Suite 300
Concord, NH 03301-5087
http://www.fws.gov/newengland

September 24, 2018

To whom it may concern:

The U.S. Fish and Wildlife Service (USFWS) reviewed the stormwater discharge activities associated with the 2016 National Pollutant Discharge and Elimination System (NPDES) Massachusetts (MA) Small Municipal Separate Storm Sewer System (MS4) general permit (MA MS4 General Permit) issued by the Environmental Protection Agency (EPA). We determined those activities may affect, but are not likely to adversely affect, certain species listed under the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) when specific conditions are met. When these conditions are met, we do not need to review individual projects. These comments are provided in accordance with section 7 of the ESA and complement existing 2016 MA MS4 General Permit Appendix C Guidance. We understand the applicant is acting as a non-Federal representative of the EPA for the purpose of consultation under section 7. **This letter provides additional guidance for meeting Criterion B and should be submitted as part of your application package to the EPA.**

If the USFWS Information for Planning and Consultation website (https://ecos.fws.gov/ipac/) indicates your MA MS4 General Permit project action area may contain one or more of the following federally listed endangered species: roseate tern (*Sterna dougallii*), northern red-bellied cooter (*Pseudemys rubriventris*), dwarf wedgemussel (*Alasmidonta heterodon*), rusty patched bumble bee (*Bombus affinis*), northeastern bulrush (*Scirpus ancistrochaetus*), or American chaffseed (*Schwalbea americana*); threatened species: piping plover (*Charadrius melodus*), bog turtle (*Glyptemys muhlenbergii*), Puritan tiger beetle (*Cicindela puritana*), northeastern beach tiger beetle (*Cicindela dorsalis*), or red knot (*Calidris canutus rufa*); or their federally designated critical habitat; and the specific conditions listed below are met, you may submit this letter to complete the **MA MS4 General Permit Appendix C: Step 4** in place of a concurrence letter for informal consultation as documentation of ESA eligibility for **USFWS Criterion B**.

In addition, this letter also satisfies the requirement in the **MA MS4 General Permit Appendix C: Step 2 (3)** to contact the USFWS and obtain a concurrence letter, if you have not yet done so. If your project action area includes one or more of the above-listed species *and* one or more of the

species listed under **Criterion C,**[1] you may still use this letter to certify under **Criterion B**. All existing guidance regarding requirements for certifying eligibility according to the USFWS Criterion A, B, or C for coverage by the 2016 MS4 Permit (see MA MS4 General Permit Appendix C – Endangered Species Guidance) remains unchanged.

We have determined that proposed stormwater discharge activities covered under the 2016 MS4 Permit *may affect, but are not likely to adversely affect*, the above-listed species and the species' critical habitat when the following are true:

1. all stormwater discharges are pre-existing or previously permitted by EPA;
2. any planned operations and maintenance work covered by this permit will only affect previously disturbed areas where stormwater controls are already installed. In these situations the chance of encountering any of the subject species is discountable;
3. the project implements EPA MS4 Best Management Practices (BMPs) and meets Clean Water Act and Massachusetts Water Quality Standards. Although permitted discharges may reach the environment used by these species, BMPs reduce pollutants to the extent that discharges are not known to have measurable impacts on these species or their habitat;
4. no new construction or structural BMPs are proposed under this permit at this time; and
5. you agree that if, during the course of the permit term, you plan to install a structural BMP not identified in the Notice of Intent (NOI), you will re-initiate consultation with the USFWS as necessary (see **MA MS4 General Permit Appendix C: Step 2 (5)**).

If the above criteria are met, further consultation with the USFWS under section 7 of the ESA is not required at this time; however, if the proposed action changes in any way such that it may affect a listed species in a manner not previously analyzed or if new information reveals the presence of additional listed species that may be affected by the project, the applicant or the EPA should contact us immediately and suspend activities that may affect those species until the appropriate level of consultation is completed with our office. Thank you for your cooperation, and please contact David Simmons of this office at (603) 227-6425 if you have questions or need further assistance.

Sincerely yours,

Thomas R Chapman
Supervisor
New England Field Office

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[1] Criterion C includes guidance for project action areas that may contain species for which EPA has already made a determination. These species include the northern long-eared bat (*Myotis septentrionalis*), sandplain gerardia (*Agalinis acuta*), small whorled pogonia (*Isotria medeoloides*), and/or American burying beetle (*Nicrophorus americanus*) (MA MS4 General Permit Appendix C: Step 3 – Determine if You Can Meet Eligibility USFWS Criterion C).

Appendix B. Photograph of Dog Waste Bag BMP

Clear Choices
Clean Runoff
Town of Bourne

Appendix C. Selectman's Agenda from May 28, 2019

Board of Selectmen
Meeting Notice
AGENDA

Date	Time	Location
May 28, 2019	6:00 P.M.	Bourne Veterans' Memorial Community Center 239 Main Street, Buzzards Bay

Note this meeting is being televised and recorded. If anyone in the audience is recording or video-taping, they need to acknowledge such at this time.

All items within the meeting agenda are subject to deliberation and vote(s) by the Board of Selectmen.

Moment of Silence for our Troops and our public safety personnel

Vision:
Bourne is a community that embraces change while respecting the rich heritage of the town and its villages. It is a municipality based on strong fiscal government with a durable economy that recognizes the rights of all citizens, respects the environment, especially the coastal areas of the community, embraces excellent education, and the amenities that it affords and offers to citizens a healthy, active lifestyle.

Mission:
Bourne will maximize opportunities for social and economic development while retaining an attractive, sustainable and secure coastline and environment for the enjoyment of residents and visitors. Through responsible and professional leadership and in partnership with others, Bourne will strive to improve the quality of life for all residents living and working in the larger community.

6:00 P.M. Call Public Session to Order in Open Session

Executive Session:
Strategy session with respect to litigation for Cumberland Farms, Inc. v. Daniel Doucette et al, Land Court Department Case No. 17MISC000063; inasmuch as the Chairman has declared that an open meeting will have a detrimental effect of the litigation position of the Town;

Roll call Vote to convene in Executive Session for the purposes stated.

Motion to enter Executive Session to conduct strategy related to Fire Department Arbitration, Superior Court issues, and Department of Labor Relations cases. The Chair has declared that an open meeting may have a detrimental effect on the litigating position of the public body.

Roll call Vote to convene in Executive Session for the purposes stated.

Motion to enter into Executive Session to conduct strategy in regards to negotiations with respect to easements on:
Map 35.0 Parcel 144 – Henry Drive, Map 35.0 Parcel 145 – 3 Henry Drive; Map 51.3 Parcel 62 – 0 Squeteague Harbor Road; Map 23.0 Parcel 4 – 90 Main Street; Map 42.0 Parcel 89 – 11 Bassett's Island. The Chair has declared that an open meeting may have a detrimental effect on the negotiating position of the public body with respect to the easements.

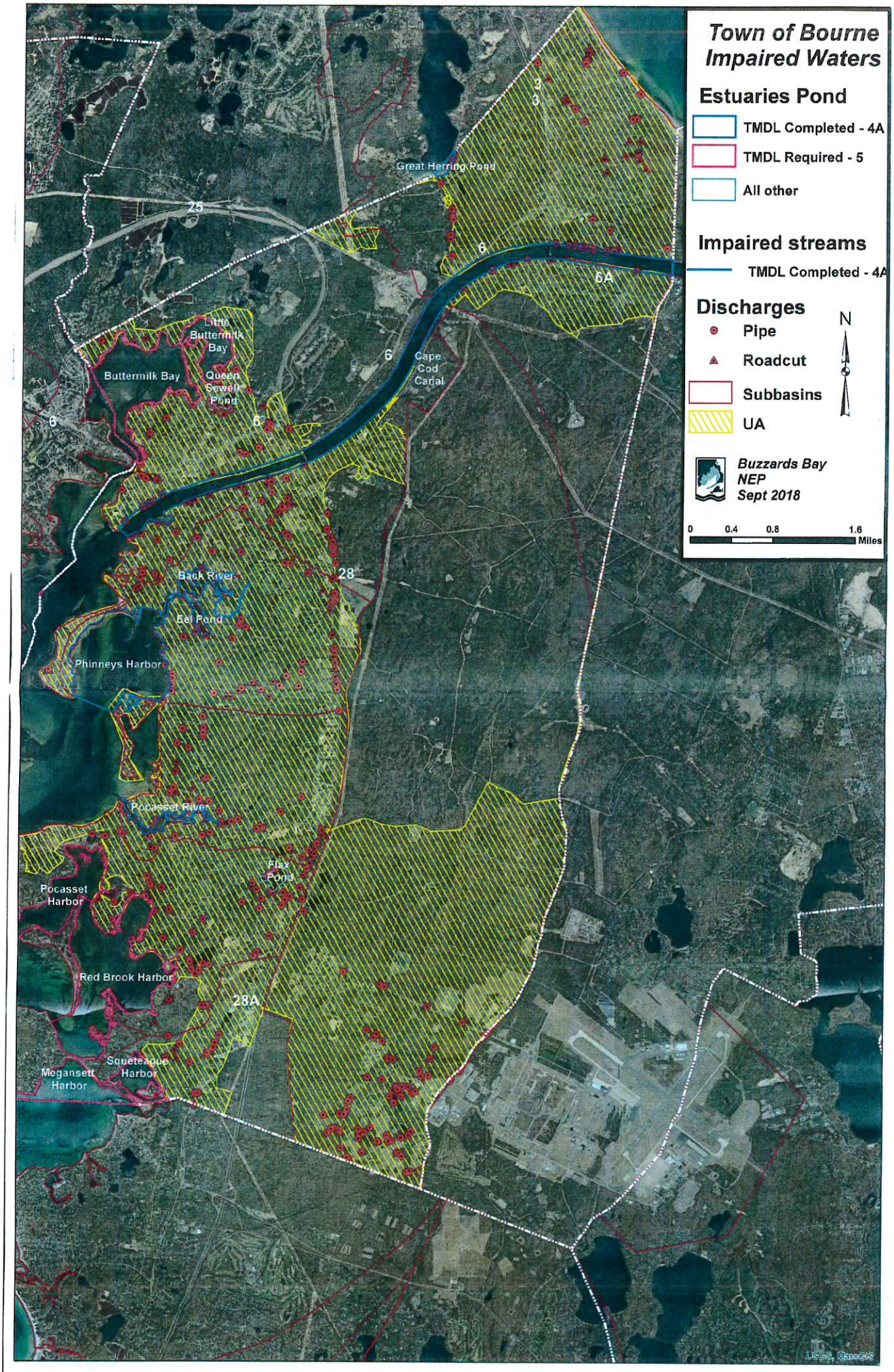
Board to report on actions taken in Executive Session and ratify such actions, if any.

Board of Selectmen will convene in public session at the conclusion of the Executive Session.

Reorganization of the Board of Selectmen - Chair, Vice Chair, Clerk

1. Salute to the Flag
2. Public Comment on Non-Agenda Items
3. Approval of minutes: 4.16.2019
4. Town Administrator Report
   a. Central Business Area Parking Committee
   b. Town Administrator Search RFQ
   c. FY 21 Capital and Budget
   d. CVEC – Electric Charging Station and possible solar canopy at BVMCB
5. Licenses/Appointments
   a. Cape Cod Regional Transit Authority Appointment
   b. 7:45 PM Hampton Inn –Year Round Innholder Alcoholic Beverages Liquor License
   c. Commission on Disabilities – Patricia A. Morley to fill unexpired term
   d. Whistle Stop – change in ownership – Common Victualer Food License for Don & Wanda Myers
6. Sam. Haines Conservation Agent (20 Minutes)
   a. Presentation of the Bourne Municipal Vulnerability Workshop Report
   b. Update on Bourne's MS4 Storm water Management Plan
7. Sagamore Highlands – Crab Rock Way request on bank stabilizing plan.. The Board will be asked to allow this to move forward to the Conservation Commission for a determination. Since the Town owns the beach below the BOS will have to allow this to move to Con. Com without any recommendation by the BOS. (Attorney Jack Vaccaro)
8. Local Comprehensive Plan – DRAFT – Mr. Wes Ewell (40 minutes)
9. Selectmen's Business
   a. Chapter 218 Section 22A ¾ - Designated Veterans' parking space for Town Hall and Bourne Veterans' Memorial Community Center.
   b. Community Engagement Committee
10. Correspondence
11. Adjourn

Appendix D. 2018 Bourne Outfall Map


Town of Bourne
Impaired Waters
Estuaries Pond
TMDL Completed - 4A
TMDL Required - 5
All other
Impaired streams
TMDL Completed - 4A
Discharges
Pipe
Roadcut
Subbasins
UA
N
Buzzards Bay
NEP
Sept 2018
0
0.4
0.8
1.6
Miles
Great Herring Pond
25
6
6A
3
3
Little
Buttermilk
Bay
Buttermilk Bay
Queen
Sewell
Pond
6
6
6
Cape
Cod
Canal
28
Back River
Eel Pond
Phinneys Harbor
Pocasset River
Flax
Pond
Pocasset
Harbor
Red Brook Harbor
28A
Squeteague
Harbor
Megansett
Harbor
USGS, MassGIS

Appendix E. Bourne Initial Outfall Inventory & Ranking

Draft Initial Outfall Ranking for IDDE Investigation

2016 Impaired Waters (Impairment Category)	Segment ID	2016 Impairments	Associated Approved TMDL (EPA#)	Additional Concerns	Rank
Back River (4a)	MA95-47	Fecal Coliform	36172	ACEC, Seasonal shellfish closure	III
Bourne Pond (5) Drains to canal	MA95-14_2008	Fecal Coliform	36171		I
Buzzards Bay					I
Cape Cod Canal (4a)	MA95-14	Fecal Coliform	36171		I
Cape Cod Bay				Swim Beach	II
Eel Pond (4a)	MA95-48	Fecal Coliform	36172	ACEC, Seasonal shellfish closure	III
Great Herring Pond & Herring river (4a)	MA94050	Mercury in Fish Tissue	33880	ACEC, Drinking water supply	III
Phinneys Harbor (4a)	MA95-15	Estuarine Bioassessments Fecal Coliform Nitrogen (Total)	35069 36172 35069	ACEC, Public Swim Beach, Seasonal shellfish closure	IIII
Pocasset River (4a)	MA95-16	Fecal Coliform	36172	ACEC, Drinking water supply, Seasonal shellfish closure	IIII
Buttermilk Bay (5)	MA95-01	Fecal Coliform Estuarine Bioassessments Nutrient/Eutrophication Biological Indicators	36172	Public Swim Beach, Seasonal shellfish closure	III
Little Buttermilk Bay (5)	MA95-76	Estuarine Bioassessments Nutrient/Eutrophication Biological Indicators	Impaired-TMDL required	Seasonal shellfish closure	II
Megansett Harbor (5)	MA95-19	Estuarine Bioassessments Fecal Coliform Nutrient/Eutrophication Biological Indicators	Impaired-TMDL required	Seasonal shellfish closure	II
Pocasset Harbor (5)	MA95-17	Estuarine Bioassessments Fecal Coliform	36172	Public Swim Beach, Seasonal shellfish closure	III
Queen Sewell Pond (5)	MA95180	Harmful Algal Bloom		Public Swim Beach	I
Redbrook Harbor (5)	MA95-18	Fecal Coliform Estuarine Bioassessments Nutrient/Eutrophication Biological Indicators	36172	Public Swim Beach, Seasonal shellfish closure	III

Draft Initial Outfall Ranking for IDDE Investigation

2016 Impaired Waters (Impairment Category)	Segment ID	2016 Impairments	Associated Approved TMDL (EPA#)	Additional Concerns	Rank
Squeteague Harbor (5)	MA95-55	Nutrient/Eutrophication Biological Indicators	Impaired-TMDL required	Public Swim Beach, Seasonal shellfish closure	III
Other Receiving Waters Flax Pond (3) Clay Pond (3)	MA95-96087				I

OUTFALL ID	HISTORIC ID	Address	Discharge Waterbody	Receiving Waterbody	MS4?	Inspector	Date Inspected	Type	Diameter	Initial IDDE Rank	Material	NOTES
OF-165	BOPHOLDP-01	66 old dam rd	Back river	Back River	Y		2/6/18	Pipe		III		
OF-248	BOPHCYDP-07	240 County	Back River	Back River	Y			Pipe		III		Appears to be a connection to Back River marsh
OF-247	BOPHCYDP-06	235 County	Back River	Back River	Y			Pipe		III		wetland connects to Back River
OF-1	BOBUHARC-01	Academy drive (marina)	Buttermilk Bay	Buttermilk Bay	Y			Roadcut	NA	III	NA	
OF-10	BOBUVWRC-01	Between 56 & 62 Rip Van Winkle	Buttermilk Bay	Buttermilk Bay				Roadcut	NA	III	NA	
OF-106	BOBUGADP-02	Electric Ave beach	Buttermilk Bay	Buttermilk Bay	y			Pipe		III		According to plan the pipe is disconected but that is not confirmed
OF-2	BOBUELRC-01	Electric Ave. boat ramp	Buttermilk Bay	Buttermilk Bay	y			Roadcut	NA	II	NA	
OF-238	BOBUOKDP-02	30 Oakley Avenue	Wetland	Buttermilk Bay	?			Pipe		III		Need to check if wetland is isolated
OF-100	BOBZACDP-05	6 Canal Place	Buzzards Bay	Buzzards Bay	Y			Pipe		I		Boat access required
OF-101	BOBZBUDP-01	buttermilk way	Buzzards Bay	Buzzards Bay	Y	JM	2/1/18	Pipe		I		
OF-102	BOBZHADP-01	harbor place	Buzzards Bay	Buzzards Bay	Y	JM	2/1/18	Pipe		I		
OF-103	BOBZHADP-02	harbor place	Buzzards Bay	Buzzards Bay	Y	JM	2/1/18	Pipe		I		
OF-104	BOBZHADP-03	harbor place	Buzzards Bay	Buzzards Bay	Y	JM	2/1/18	Pipe		I		
OF-98	BOBZACDP-03	64 Academy drive	Buzzards Bay	Buzzards Bay	Y			Pipe		I		Boat access required
OF-99	BOBZACDP-04	54 Academy drive	Buzzards Bay	Buzzards Bay	Y			Pipe		I		Boat access required
OF-256	BOSCSTDP-01	Sagamore Road Parking/Ramp	Sagamore Beach	Cape Cod Bay	Y			Pipe		II		Same Historic ID as OF-266
OF-256	BOSCSADP-01	Sagamore Road Parking/Ramp	Sagamore Beach	Cape Cod Bay	Y			Pipe		II		
OF-266	BOSCSTDP-01	Standish Beach Parking/ramp	Sagamore Beach	Cape Cod Bay	Y			Pipe		II		
OF-80	BOSCSTRC-01	60 Standish	Sagamore Beach	Cape Cod Bay	Y			Roadcut	NA	II	NA	
OF-85	BOSCMPRC-01	17 Marsh Pond Road	Sagamore Beach	Cape Cod Bay	Y			Roadcut	NA	II	NA	
OF-86	BOSCMPRC-02	Marsh Pond Road/270 Williston	Sagamore Beach	Cape Cod Bay	Y			Roadcut	NA	II	NA	
OF-84	BOSCWIRC-03	Salt Marsh Ponds off Williston	Sagamore Beach	Cape Cod Bay	y			Roadcut	NA	II	NA	
OF-83	BOSCWIRC-02	Salt Marsh Ponds off Williston	Sagamore Beach	Cape Cod Bay	y			Roadcut	NA	II	NA	
OF-87	BOSCWIRC-04	Salt Marsh Ponds off Williston	Sagamore Beach	Cape Cod Bay	y			Roadcut	NA	II	NA	
OF-88	BOSCWIRC-05	Salt Marsh Ponds off Williston	Sagamore Beach	Cape Cod Bay	y			Roadcut	NA	II	NA	
OF-113	BOBZOBDP-01	Old Bridge Road	Bourne Pond	Cape Cod Canal	Y			Pipe		I		
OF-114	BOBZPEDP-01	24 Perry ave	Bourne Pond	Cape Cod Canal	Y		2/6/18	Pipe		I	Steel	
OF-115	BOBZEVDP-01	7 Everett rd	Bourne Pond	Cape Cod Canal	Y		2/6/18	Pipe		I		
OF-142	BOBZJEDP-01	170 Jefferson	Canal	Cape Cod Canal	Y			Pipe		I		
OF-12	BOBZCVRC-01	End of Canal View	Canal	Cape Cod Canal	Y			Roadcut	NA	I	NA	
OF-278	BOSCCNDP-01	Canal Road	Canal	Cape Cod Canal	?			Pipe		I		Appears to be part of Federal Stormwater System but may tie into Canal Street/Hunters Brook
OF-270	BOSCHPDP-04	199 Herring Pond Road	Herring River	Cape Cod Canal	Y			Pipe		III		Herring run
OF-271	BOSCHPDP-05	165 herring Pond Road	Herring River	Cape Cod Canal	Y			Pipe		III		Herring run
OF-273	BOSCHPDP-06	0 Herring Pond Road	Herring River	Cape Cod Canal	Y			Pipe		III		Herring run
OF-274	BOSCHPDP-07	0 Herring Pond Road	Herring River	Cape Cod Canal	Y			Pipe		III		Herring run
OF-275	BOSCHPDP-08	12 Herring Pond Road	Herring River	Cape Cod Canal	Y			Pipe		III		Herring run
OF-276	BOSCHPDP-09	12 Herring Pond Road	Herring River	Cape Cod Canal	Y			Pipe		III		Herring run

OF-8	BOBZOBRC-01	18 Old Bridge Road	canal	Cape Cod Canal	Y			Roadcut	NA	I	NA	
OF-254	BOPHNODP-06	68 North Beach Ave	Eel Pond	Eel Pond	Y			Pipe		III		
OF-149	BOPHCADP-01	Eel Pond Rd & carlton rd	Eel Pond	Eel Pond	Y		2/8/18	Pipe		III		
OF-181	BOPHNODP-03	Burtonwood Avenue	Eel Pond	Eel Pond	Y		2/8/18	Pipe		III		
OF-267	BOSCHPDP-01	Across from 262 Herring Pond road	Great Herring Pond	Great Herring Pond	Y			Pipe		III		
OF-268	BOSCHPDP-02	Across from 260 Herring Pond road	Great Herring Pond	Great Herring Pond	Y			Pipe		III		
OF-269	BOSCHPDP-03	Herring Pond Road (across from 7 Great Pines Dr.)	Great Herring Pond	Great Herring Pond	Y			Pipe		III		
OF-13	BOBULBRC-01	Corner of Puritan & Little Bay	Barros Bogs	Little Buttermilk Bay	y			Roadcut	NA	II	NA	Same Legacy ID as OF-13
OF-14	BOBULBRC-02	Corner of Puritan & Little Bay	Barros Bogs	Little Buttermilk Bay	y			Roadcut	NA	II	NA	
OF-15	BOBULBRC-01	End of Vicki Cr.	Barros Bogs	Little Buttermilk Bay	y			Roadcut	NA	II	NA	Same Legacy ID as OF-13
OF-235	BOBULBDP-06	6 Venn Ln	Barros Bogs	Little Buttermilk Bay	Y			Pipe		II		
OF-110	BOBULBDP-04	15 Little Bay	Little Buttermilk Bay	Little Buttermilk Bay	y			Pipe		II		
OF-111	BOBUPRDP-02	11 Bayhead Shores	Little Buttermilk Bay	Little Buttermilk Bay	Y			Pipe		II		
OF-233	BOBUPUDP-06	Puritan opposite Alderberry	Little Buttermilk Bay	Little Buttermilk Bay	y			Pipe		II		
OF-236	BOBUFADP-01	Between 2 & 4 Fabyan way	Little Buttermilk Bay	Little Buttermilk Bay	Y			Pipe	NA	II	NA	
OF-237	BOBUFADP-02	6 Fabyan	Little Buttermilk Bay	Little Buttermilk Bay	Y			Pipe		II		Off cul-de-sac
OF-60	BOBUHBRC-01	Corner of Head of the Bay and Old Head of the Bay	Little Buttermilk Bay	Little Buttermilk Bay	y			Roadcut		II		
OF-61	BOBUSNRC-01	End of Snow Circle	Little Buttermilk Bay	Little Buttermilk Bay	y			Roadcut	NA	II	NA	
OF-109	BOBUPUDP-05	Puritan rd opposite Alderberry	Little Buttermilk Bay	Little Buttermilk Bay	Y		2/6/18			II		
OF-167	BOPHCPDP-01	clay pond rd	clay pond	Other	Y		2/8/18, 2/2/13/18	Pipe		I		
OF-137	BOPHWEDP-03	119 Valley Bars	clay pond	Other	Y			Pipe		I		
OF-158	BOHCWIDP-01	0 Williams	Flax Pond,	Other	Y			Pipe		I		
OF-159	BOHCWIDP-02	adjacent to 129 Williams	Flax Pond,	Other	Y			Pipe		I		
OF-226	BOHCLXDP-04	Corner of Lake Dr. & Lake Dr. ext.	Flax Pond,	Other	Y			Pipe		I		
OF-227	BOHCLXDP-03	Corner of Lake Dr. & Lake Dr. ext.	Flax Pond,	Other	Y			Pipe		I		
OF-170	BOBZEMDP-01	Emmons rd, monument beach	Phinneys Harbor	Phinneys Harbor	Y		2/8/18	Pipe		IIII		
OF-144	BOBZMSDP-01	2 Sunny Lane	Phinneys Harbor	Phinneys Harbor	Y			Pipe		IIII		
OF-147	BOBZWRDP-01	2 Warren Road	Phinneys Harbor	Phinneys Harbor	Y			Pipe		IIII		
OF-185	BOBZMSDP-02	20 Mashnee	Phinneys Harbor	Phinneys Harbor	Y			Pipe		IIII		
OF-19	BOBZMARC-01	0 Mashnee	Phinneys Harbor	Phinneys Harbor	Y			Roadcut	NA	IIII	NA	
OF-20	BOBZMARC-02	0 Mashnee	Phinneys Harbor	Phinneys Harbor	Y			Roadcut	NA	IIII	NA	
OF-21	BOBZMARC-03	0 Mashnee	Phinneys Harbor	Phinneys Harbor	Y			Roadcut	NA	IIII	NA	
OF-205	BOPRSHDP-19	Shore Rd. opposite Bennets Neck	Phinneys Harbor	Phinneys Harbor	Y			Pipe		IIII		
OF-153	BOPRSHDP-16	Shore Rd. opposite Bennets Neck	Phinneys Harbor	Phinneys Harbor	Y			Pipe		IIII		

OF-59	BOPRSHRC-01	Shore Rd. opposite Bennets Neck	Phinneys Harbor	Phinneys Harbor	Y			roadcut		IIII		
OF-174	BOBZKWDP-04	45 Cove, off Kenwood	Pocasset harbor	Pocasset harbor	Y			Pipe		III		Is this a culvert?
OF-175	BOBZKWDP-03	45 Cove, off Kenwood	Pocasset harbor	Pocasset harbor	Y			Pipe		III		
OF-203	BOBZNSDP-01	53 wings neck	Pocasset harbor	Pocasset harbor	Y			Pipe		III		
OF-243	BOBZWNDP-05	45 Cove, off Kenwood	Pocasset harbor	Pocasset harbor	Y			Pipe		III		
OF-239	BOBZWNDP-05	37 Wings Neck	Pocasset harbor	Pocasset harbor	Y			Pipe		III		
OF-193	BOBZBLDP-15	Barlows Landing beach	Pocasset harbor	Pocasset harbor	Y			Pipe		III		
OF-204	BOPRSHDP-15	729 Shore	Pocasset River	Pocasset harbor	Y			Pipe		III		
OF-56	BOPRPARC-01	6 Paulinda	Pocasset River	Pocasset River	Y			roadcut		IIII		Need to perform site visit
OF-57	BOPRPARC-02	6 Paulinda	Pocasset River	Pocasset River	Y			roadcut		IIII		Need to perform site visit
OF-55	BOPRCIRC-01	end of Circle Lane	Pocasset River	Pocasset River	Y			roadcut		IIII		Need to perform site visit
OF-155	BOPRBNDP-03	20 Bennets Neck	Pocasset River	Pocasset River	Y			Pipe		IIII		
OF-211	BOPRSHDP-13	Shore road park	Pocasset River	Pocasset River	Y			Pipe		IIII		
OF-212	BOPRSHDP-10	Shore rd park	Pocasset River	Pocasset River	Y			Pipe		IIII		
OF-206	BOPRBLDP-22	226 Barlows Landing	Pocasset River	Pocasset River	Y			Pipe		IIII		
OF-208	BOPRBLDP-23	226 Barlows Landing	Pocasset River	Pocasset River	Y			Pipe		IIII		
OF-209	BOPRBLDP-25	294 Barlows Landing	Pocasset River	Pocasset River	Y			Pipe		IIII		
OF-213	BOPRCYDP-08	4 Ponds Conservation Area	Pocasset River	Pocasset River	Y			Pipe		IIII		
OF-214	BOPRCYDP-07	710 County	Pocasset River	Pocasset River	Y			Pipe		IIII		
OF-215	BOPRCYDP-09	710 County	Pocasset River	Pocasset River	Y			Pipe		IIII		
OF-216	BOPROBDP-03	9 Observatory	Pocasset River	Pocasset River	Y			Pipe		IIII		
OF-217	BOPROBDP-02	17 Observatory	Pocasset River	Pocasset River	Y			Pipe		IIII		
OF-172	BOPRWBDP-01	Wenaumet bluffs ramp	Pocasset River	Pocasset River	Y			Pipe		IIII		
OF-173	BOPRWBDP-02	Tideway Road	Pocasset River	Pocasset River	Y			Pipe		IIII		
OF-198	BOPRBLDP-35	841 Barlows Landing	Pocasset River	Pocasset River	Y			Pipe		IIII		
OF-197	BOPRBLDP-34	841 Barlows Landing	Pocasset River	Pocasset River	Y			Pipe		IIII		
OF-210	BOPRSHDP-06	13 River Road	Pocasset River	Pocasset River	Y			Pipe		IIII		
OF-116	BOBUCYDP-01	Cherry St.	Queen Sewall Pond	Queen Sewall Pond	Y			Pipe		I		
OF-117	BOBUMADP-03	12 Maple	Queen Sewall Pond	Queen Sewall Pond	Y			Pipe		I		
OF-118	BOBUBRDP-03	15 Maple	Queen Sewall Pond	Queen Sewall Pond	Y			Pipe		I		
OF-119	BOBUPUDP-11	Puritan across from Barros Bogs	Queen Sewall Pond	Queen Sewall Pond	Y			Pipe		I		
OF-231	BOBUHBDP-07	162 Puritan	Queen Sewall Pond	Queen Sewall Pond	y			Pipe		I		Off Head of the bay. Discharges into bogs.
OF-3	BOBUMARC-03	12 Maple	Queen Sewall Pond	Queen Sewall Pond	y			Roadcut	NA	I	NA	
OF-234	BOBUPUDP-08	Between 78 & 94 Puritan across fom Lewis Point Road	Vegetated wetland adjacent to QS pond	Queen Sewall Pond	Y			Pipe		I		
OF-303	BOHCBVDP-01	34 Bellavista Drive	Hen Cove	Red Brook Harbor	Y			Pipe		III		Is this a leaching basin
OF-176	BOHCVIDP-01	12 Island Drive	Hen Cove	Red Brook Harbor	Y			Pipe		III		Is this a leaching basin
OF-305	BOCOISDP-02	Conservation Pond	Hen Cove	Red Brook Harbor	Y			Pipe		III		
OF-304	BOCOISDP-01	Conservation Pond	Hen Cove	Red Brook Harbor	Y			Pipe		III		
OF-194	BOHCSHDP-08	82 Prospect	Hen Cove	Red Brook Harbor	Y			Pipe		III		Need to check to see if it connects to US water
OF-306			Hen Cove	Red Brook Harbor				Roadcut		III		Is this a culvert?

OF-307			Hen Cove	Red Brook Harbor				roadcut		III		Is this a culvert?
OF-120	BOHCCIDP-01	across from 96 Circuit	Hen cove	Red Brook Harbor	Y			Pipe		III		Is there really a pipe there? I thought it as just a roadcut.
OF-121	BOHCBBDP-01	At the end of Hill Street	Hen Cove	Red Brook Harbor	Y			Pipe		III		
OF-200	BOHCSPDP-0	Terminus of Spruce Dr.	Hen Cove	Red Brook Harbor	Y			Pipe		III		
OF-123	BOHCCPDP-05	Terminus of Spruce Dr.	Hen Cove	Red Brook Harbor	Y			Pipe		III		
OF-122	BOHCSPDP-08	Terminus of Spruce Dr.	Hen Cove	Red Brook Harbor	Y			Pipe		III		
OF-124	BOHCCIDP-09	80 Cedar Point	Hen Cove	Red Brook Harbor	Y			Pipe		III		
	BOHCSPDP-07	Spruce Drive	Hen Cove	Red Brook Harbor	Y					III		
OF-196	BOHCSHDP-18	984 Shore	Isolated Wetland	Red Brook Harbor	Y			Pipe		III		Need to see if this actually connects to Hens Cove
OF-195	BOHCSHDP-20	1000 Shore	Isolated Wetland	Red Brook Harbor	Y			Pipe		III		Need to see if this actually connects to Hens Cove
	BORBREDP-03	RB Harbor Rd at marina	Red Brook Harbor	Red Brook Harbor	Y					III		
OF-220	BORBSHDP-20	County Rd S side of RR adjacent to Kingmans	Red Brook Harbor	Red Brook Harbor	Y			Pipe		III		
OF-179	BOSHLHDP-01	999 County, Cranberry bogs	Red Brook Harbor	Red Brook Harbor	Y			Pipe		III		
OF-229	BOSHCYDP-12	999 County, Cranberry bogs	Red Brook Harbor	Red Brook Harbor	Y			Pipe		III		
OF-191	BORBSHDP-21	Redbrook pond	Red Brook Harbor	Red Brook Harbor	Y			Pipe		III		
OF-192	BORBSHDP-22	Redbrook pond	Red Brook Harbor	Red Brook Harbor	Y			Pipe		III		
OF-178	BORBSHDP-23	Redbrook pond	Red Brook Harbor	Red Brook Harbor	Y			Pipe		III		
OF-222	BORBSHDP-23	18 Red Brook Harbor	Red Brook Harbor	Red Brook Harbor	Y			Pipe		III		
OF-221	BORBREDP-03	Town Ramp North of Parkers	Red Brook Harbor	Red Brook Harbor	Y			Pipe		III		
OF-49	BORBRBRC-01	100 Red Brook Harbor Rd	Red Brook Harbor	Red Brook Harbor	Y			roadcut	NA	III	NA	
OF-52	BORBRBRC-02	100 Red Brook Harbor Rd	Red Brook Harbor	Red Brook Harbor	Y			roadcut	NA	III	NA	
OF-50	BORBRBRC-03	100 Red Brook Harbor Rd	Red Brook Harbor	Red Brook Harbor	Y			roadcut	NA	III	NA	
OF-51	BORBRBRC-04	100 Red Brook Harbor Rd	Red Brook Harbor	Red Brook Harbor	Y			roadcut	NA	III	NA	
OF-199	BOBZCIDP-02	Conservation Land north of Hen cove Beach	Patuisset Marsh	Redbrook Harbor	Y			Pipe		III		No Pipe located at inspection
OF-184	BOSHSCDP-01	Rail line at corner of Depot and Scraggy Neck	Squeteague Harbor	Squeteague Harbor	Y			Pipe		III		need to ccheck where this one goes
OF-251	BOSHCYDP-06	10 Long Pond way	Squeteague Harbor	Squeteague Harbor	Y			Pipe		III		Recieves water from County Rd
OF-189	BOSHCYDP-08	1251 Conty	Squeteague Harbor	Squeteague Harbor	Y			Pipe		III		
OF-188	BOSHCYDP-10	1265 County	Squeteague Harbor	Squeteague Harbor	Y			Pipe		III		
OF-44	BOSHCORC-01	1275 C0onty	Squeteague Harbor	Squeteague Harbor	Y			roadcut	NA	III	NA	
OF-187	BOSHCYDP-11	Corner of County and scraggy neck	Squeteague Harbor	Squeteague Harbor	Y			Pipe		III		
OF-45	BOSHSQRC-01	Corner of County and scraggy neck	Squeteague Harbor	Squeteague Harbor	Y			roadcut		III		culverts?
OF-46	BOSHSQRC-02	Corner of County and scraggy neck	Squeteague Harbor	Squeteague Harbor	Y			roadcut		III		Culverts?

OF-230	BOSH28ADP-05	State Rte 28A	0 Oliver Way		N			Pipe		NA		State Road
OF-141	BOPHOFDP-01	Old Forge Lane	Back River		N			Pipe	NA	NA	NA	Private Road
OF-164	BOPHMADP-01	Marian Lane	Back River		N			Pipe	NA	NA	NA	Private Road
OF-165	BOBZWHDP-02	Waterhouse Road	Back River		N			Pipe	NA	NA	NA	State Road
OF-145	BOPHANDP-01	Anne lane	Back River		N		2/6/18		NA	NA	NA	Private Road
OF-166	BOPHBEDP-01	4 Beachwood	Back River		N			Pipe	NA	NA	NA	Private Road
OF-107	BOBU6DP-01	5 Main St.	Buttermilk Bay		N			Pipe	NA	NA	NA	State Road
OF-108	BOBUQUDP-03	End of Quamhasset rd	Little Buttermilk Bay		N			Pipe	NA	NA	NA	Private road
OF-62	BOBUTSRC-01	Thompson	Buttermilk Bay		N			Roadcut	NA	NA	NA	Private Road (Hideaway)
OF-63	BOBUDWRC-01	Deep water Way	Buttermilk Bay		N			Roadcut	NA	NA	NA	Private Road (Hideaway)
OF-64	BOBUSURC-01	Bog View	Buttermilk Bay		N			Roadcut	NA	NA	NA	Private Road (Hideaway)
OF-65	BOBUNARC-01	Nautical	Buttermilk Bay		N			Roadcut	NA	NA	NA	Private Road (Hideaway)
OF-9	BOBUGNRC-01	107 Lewis Point	Buttermilk Bay		N			Roadcut	NA	NA	NA	Private road
OF-105	BOBZTADP-01	taylor rd	Buzzards Bay		N			Pipe	NA	NA	NA	This appears to be on Federal land
OF-186	BOBZSTDP-01	Starboard Road	Buzzards Bay		N			Pipe	NA	NA	NA	Private Road
OF-22	BOBZSTRC-01	Starboard Road	Buzzards Bay		N			Roadcut	NA	NA	NA	Private Road
OF-97	BOBZACDP-02	Academy drive	Buzzards Bay		N	JM	2/1/18	Pipe	NA	NA	NA	Part of MA Maritime system
OF-125	BOBZFE-DP-01	Canal Service Road under Bourne bridge	Canal		?			Pipe	NA	NA	NA	Appears to be part of Federal Stormwater System but may take water from Emerson Ave
OF-279	BOSCCNDP-02	Canal Service Road	Canal		N			Pipe	NA	NA	NA	Appears to be part of Federal Stormwater System
OF-280	BOSCCNDP-03	Canal Service Road	Canal		N			Pipe	NA	NA	NA	Appears to be part of Federal Stormwater System
OF-281	BOSCCNDP-20	Canal Service Road	Canal		N			Pipe	NA	NA	NA	Appears to be part of Federal Stormwater System
OF-282	BOSCCNDP-21	Canal Service Road	Canal		N			Pipe	NA	NA	NA	Appears to be part of Federal Stormwater System
OF-283	BOSCCNDP-22	Canal Service Road	Canal		N			Pipe	NA	NA	NA	Appears to be part of Federal Stormwater System
OF-284	BOSCCNDP-23	Canal Service Road	Canal		N			Pipe	NA	NA	NA	Appears to be part of Federal Stormwater System
OF-285	BOSCCNDP-24	Canal Service Road	Canal		N			Pipe	NA	NA	NA	Appears to be part of Federal Stormwater System
OF-286	BOSCCNDP-25	Canal Service Road	Canal		N			Pipe	NA	NA	NA	Appears to be part of Federal Stormwater System
OF-287	BOSCCNDP-26	Canal Service Road	Canal		N			Pipe	NA	NA	NA	Appears to be part of Federal Stormwater System
OF-289	BOSCCNDP-05	Service Road/under bridge	Canal		N			Pipe	NA	NA	NA	Appears to be part of Federal Stormwater System, same historical ID as OF-295
OF-294	BOSCCNDP-04	Canal Service Road	Canal		N			Pipe	NA	NA	NA	Appears to be part of Federal Stormwater System
OF-295	BOSCCNDP-05	Canal Service Road	Canal		N			Pipe	NA	NA	NA	Appears to be part of Federal Stormwater System
OF-296	BOSCCNDP-06	Canal Service Road	Canal		N			Pipe	NA	NA	NA	Appears to be part of Federal Stormwater System
OF-297	BOSCCNDP-07	Canal Service Road	Canal		N			Pipe	NA	NA	NA	Appears to be part of Federal Stormwater System
OF-298	BOSCCNDP-08	Canal Service Road	Canal		N			Pipe	NA	NA	NA	Appears to be part of Federal Stormwater System
OF-291	BOSCCNDP-09	Canal Service Road	Canal		N			Pipe	NA	NA	NA	Appears to be part of Federal Stormwater System
OF-300	BOSCCNDP-29	Canal Service Road	Canal		N			Pipe	NA	NA	NA	Appears to be part of Federal Stormwater System
OF-299	BOSCCNDP-29	Canal Service Road	Canal		N			Pipe	NA	NA	NA	Appears to be part of Federal Stormwater System. Same historical ID as OF-300
OF-89	BOSCCNDP-01	Canal Service Road	Canal		N			Roadcut	NA	NA	NA	Appears to be part of Federal Stormwater System
OF-90	BOSCCNDP-02	Canal Service Road	Canal		N			Roadcut	NA	NA	NA	Appears to be part of Federal Stormwater System
OF-91	BOSCCNDP-03	Canal Service Road	Canal		N			Roadcut	NA	NA	NA	Appears to be part of Federal Stormwater System
OF-92	BOSCCNDP-04	Canal Service Road	Canal		N			Roadcut	NA	NA	NA	Appears to be part of Federal Stormwater System
OF-93	BOSCCNDP-05	Service Road/under bridge	Canal		N			Roadcut	NA	NA	NA	Appears to be part of Federal Stormwater System, same historical ID as OF-295

OF-30	BOPHRCRC-01	Roundhouse	Clay pond		N			roadcut	NA	NA	NA	Private road
OF-202	BORBELDP-02	135 Elgin	Hen Cove		N			Pipe	NA	NA	NA	private road
OF-201	BORBELDP-01	135 Elgin	Hen Cove		N			Pipe	NA	NA	NA	private road
OF-240	BORBELDP-08	91 Elgin	Hen Cove		N			Pipe	NA	NA	NA	private road
OF-261	BOSCOPDP-02	333 Old Plymouth	Isolated Pond		N			Pipe	NA	NA	NA	Does not appear to have any connection to waters of US
OF-11	BOBUVBRC-01	11 Van Bummel	Isolated Wetland		N			Roadcut	NA	NA	NA	
OF-232	BOBUSTDP-04	15 Studio	Isolated Wetland		N			Pipe	NA	NA	NA	Private road
OF-7	BOBUUNRC-01	End of Finch Lane	Isolated wetland		N			Roadcut	NA	NA	NA	Private Road
OF-146	BOBZTHDP-01	44 Monument Neck	Isolated Wetland		N				NA	NA	NA	No observed connection to waters of the US
OF-148	BOPHSHDP-01	375 Shore Road	Isolated Wetland		N				NA	NA	NA	No observed connection to waters of the US
OF-249	BOPHMIDP-03	0 County, across from Millbrook	Isolated wetland		N			Pipe	NA	NA	NA	No observed connection to waters of the US
OF-244	BOPRCYDP-23	465 County	Isolated wetland		N			Pipe	NA	NA	NA	No observed connection to waters of the US
OF-245	BOPRCYDP-21	493 County	Isolated wetland		N			Pipe	NA	NA	NA	No observed connection to waters of the US
OF-246	BOPRCYDP-20	509 County	Isolated wetland		N			Pipe	NA	NA	NA	No observed connection to waters of the US
OF-171	BOPRCYDP-18	511 County	Isolated wetland		N			Pipe	NA	NA	NA	No observed connection to waters of the US
OF-207	BOPRCYDP-13	656 County	Isolated wetland		N			Pipe	NA	NA	NA	No observed connection to waters of the US
OF-218	BOPRCYDP-11	671 County	Isolated wetland		N			Pipe	NA	NA	NA	No observed connection to waters of the US
OF-156	BOPRBRDP-01	Windrush Ave	Isolated wetland		N			Pipe	NA	NA	NA	Private road
OF-225	BOPRALDP-01	19 Williams	Isolated wetland		N			Pipe	NA	NA	NA	No observed connection to waters of the US
OF-223	BOHCCYDP-10	875 County	Isolated wetland		N			Pipe	NA	NA	NA	No observed connection to waters of the US
OF-224	BOHCCYDP-12	875 County	Isolated wetland		N			Pipe	NA	NA	NA	No observed connection to waters of the US
OF-250	BORBDEDP-01	9 Depot Road	Isolated Wetland		N			Pipe	NA	NA	NA	Does not appear to be connected to a Waters of US
OF-190	BORBCYDP-22	1184 County	Isolated wetland		N			Pipe	NA	NA	NA	Does not appear to be connected to a Waters of US
OF-96	BORBRBRC-06	171 Red Brook harbor Rd	Isolated wetland		N			roadcut	NA	NA	NA	Does not appear to be connected to a Waters of US
OF-139	BOPHHWDP-01	4 Howard	Isolated wetland		N			Pipe	NA	NA	NA	Water comes off Thom as well as Howard
OF-138	BOPHTHDP-03	49 Thom	Isolated wetland		N			Pipe	NA	NA	NA	No observed connection to waters of the US
OF-157	BOPRWRDP-01	windrush Ave	Lily Pond		N			Pipe	NA	NA	NA	Private road
OF-43	BOPRWRRC-01	windrush Ave	Lily Pond		N			roadcut	NA	NA	NA	Private road
OF-16	BOBZSBRC-03	Sea Breeze Dr.	Phinneys Harbor		N			Roadcut	NA	NA	NA	Private Road
OF-17	BOBZSBRC-02	Sea Breeze Dr.	Phinneys Harbor		N			Roadcut	NA	NA	NA	Private Road
OF-18	BOBZSBRC-01	Sea Breeze Dr.	Phinneys Harbor		N			Roadcut	NA	NA	NA	Private Road
OF-162	BOBZSEDP-01	50 Seabreeze	Phinneys Harbor		N			Pipe	NA	NA	NA	Private Road
OF-177	BORBMPDP-01	3 mill Pond Circle	Red Brook Harbor		N			Pipe	NA	NA	NA	Private road
OF-241	BORBRBDP-02	15 Red Brook Pond Road	Red Brook Harbor		N			Pipe	NA	NA	NA	Private road
OF-242	BORBRBDP-01	5 Red Brook Pond	Red Brook Harbor		N			Pipe	NA	NA	NA	Private road
OF-183	BORBPODP-01	Post Office Lane	Red Brook Harbor		N			Pipe	NA	NA	NA	Private Road
OF-129	BOBZWHDP-01	20 Cotuit Road	Shrub swamp		?			Pipe	NA	NA	NA	State Road but looks like it accepts water from Cotuit
OF-140	BOBZSHDP-01	25 Shore	Small isolated wetland		N			Pipe	NA	NA	NA	
OF-277	BOSCHPDP-10	6 Bournedale Road	Unknown		?			pipe	NA	I	NA	Requires field inspection to determine if jurisdictional
OF-78	BOSCOPRC-09	243 Old Plymouth	Unknown		?			Roadcut	NA	I	NA	Does not appear to be jurisdictional but site review is suggested
OF-180	BOPHSHDP-02	Shore Rd across from Gaffield	Unknown		?			Pipe		I		I think this just dumps into upland woods but we need to check.
OF-126	BOBZMWDP-01	Maritime Road	Unkown		N			Pipe	NA	NA	NA	Private road

OF-290	BOSCCNDP-10	Across from 25 savory Ave	Unkown		?			Pipe	NA	I	NA	Needs inspection to determine if it is connected to savory Ave and enters the Canal
OF-112	BOBUSHDP-05	9 Shamrock	Upland		N			Pipe	NA	NA	NA	
OF-127	BOBZKEDP-01	45 Keene	Upland		N			Pipe	NA	NA	NA	
OF-128	BOBZCTDP-01	70 Trowbridge/school property	Upland		N			Pipe	NA	NA	NA	
OF-130	BOBZCTDP-07	70 Trowbridge/across from school	Upland		N			Pipe	NA	NA	NA	
OF-131	BOBZDBDP-01	2 DeBoer Lane	Upland		N			Pipe	NA	NA	NA	Private Road
OF-132	BOPHSUDP-01	Holly Circle	Upland		N			Pipe	NA	NA	NA	Private Road
OF-133	BOPHHEDP-01	Surrey Lane	Upland		N			Pipe	NA	NA	NA	Private Road
OF-134	BOPHCCDP-01	Coach Road	Upland		N			Pipe	NA	NA	NA	Private Road
OF-255	BOSC3ADP-01	Old route 3A, near plymouth line	Upland		N			Pipe	NA	NA	NA	I believe this is a State Road
OF-258	BOSCWIDP-01	Side of 349 Williston along Priscilla Road	Upland		N			Pipe	NA	NA	NA	
OF-259	BOSCSTDP-03	173 standish	Upland		N			Pipe	NA	NA	NA	
OF-260	BOSCSTDP-02	173 Standish	Upland		N			Pipe	NA	NA	NA	
OF-262	BOSCOPDP-01	9 Norris	Upland		N			Pipe	NA	NA	NA	No evidence of jurisdictional Waters of US on State Mapping
OF-263	BOSCNODP-01	86 Norris	Upland		N			Pipe	NA	NA	NA	No evidence of jurisdictional Waters of US on State Mapping
OF-264	BOSCNODP-02	85 Norris	Upland		N			Pipe	NA	NA	NA	No evidence of jurisdictional Waters of US on State Mapping
OF-265	BOSCNODP-03	85 Norris	Upland		N			Pipe	NA	NA	NA	No evidence of jurisdictional Waters of US on State Mapping
OF-272	BOSCSTDP-04	100 Standish	Upland		N			Pipe	NA	NA	NA	Does not appear to enter US water
OF-292	BOSCWIDP-02	31 Williston	Upland		N			Pipe	NA	NA	NA	No evidence of jurisdictional Waters of US on State Mapping
OF-293	BOSCOPDP-03	Corner of Meetinghouse & Old Plymouth	Upland		N			Pipe	NA	NA	NA	No evidence of jurisdictional Waters of US on State Mapping
OF-66	BOSCNORC-01	136 Norris Road	Upland		N			Roadcut	NA	NA	NA	
OF-67	BOSCNORC-02	136 Norris Road	Upland		N			Roadcut	NA	NA	NA	
OF-68	BOSCNORC-03	136 Norris Road	Upland		N			Roadcut	NA	NA	NA	
OF-69	BOSCNORC-04	2 Jones	Upland		N			Roadcut	NA	NA	NA	
OF-23	BOBZPERC-01	Aptuxet Road	Upland		N			Roadcut	NA	NA	NA	No evidence of jurisdictional Waters of US on State Mapping
OF-24	BOBZKERC-01	38 Keene	Upland		N			Roadcut	NA	NA	NA	
OF-25	BOBZCORC-04	70 Trowbridge/across from school	Upland		N			Roadcut	NA	NA	NA	
OF-26	BOBZCORC-03	70 Trowbridge/across from school	Upland		N			Roadcut	NA	NA	NA	
OF-27	BOBZCORC-02	70 Trowbridge/across from school	Upland		N			Roadcut	NA	NA	NA	
OF-28	BOBZCORC-01	70 Trowbridge/across from school	Upland		N			Roadcut	NA	NA	NA	
OF-29	BOBZCORC-05	70 Trowbridge/school property	Upland		N			Roadcut	NA	NA	NA	
OF-94	BOSCSVRC-01	35 Savery	Upland		N			Roadcut	NA	NA	NA	No evidence of jurisdictional Waters of US
OF-70	BOSCOPRC-01	166 Old Plymouth Road	Upland		N			Roadcut		NA		
OF-71	BOSCOPRC-02	Across from 364 Old Plymouth Road	Upland		N			Roadcut	NA	NA	NA	No evidence of jurisdictional Waters of US on State Mapping
OF-72	BOSCOPRC-03	Across from 364 Old Plymouth Road	Upland		N			Roadcut	NA	NA	NA	No evidence of jurisdictional Waters of US on State Mapping
OF-73	BOSCOPRC-04	Across from 360 Old Plymouth Road	Upland		N			Roadcut	NA	NA	NA	No evidence of jurisdictional Waters of US on State Mapping
OF-74	BOSCOPRC-05	Across from 360 Old Plymouth Road	Upland		N			Roadcut	NA	NA	NA	No evidence of jurisdictional Waters of US on State Mapping
OF-75	BOSCOPRC-06	Across from 360 Old Plymouth Road	Upland		N			Roadcut	NA	NA	NA	No evidence of jurisdictional Waters of US on State Mapping
OF-76	BOSCOPRC-07	Across from 358 Old Plymouth Road	Upland		N			Roadcut	NA	NA	NA	No evidence of jurisdictional Waters of US on State Mapping

OF-77	BOSCOPRC-08	Across from 358 Old Plymouth Road	Upland		N			Roadcut	NA	NA	NA	No evidence of jurisdictional Waters of US on State Mapping
OF-79	BOSCOPRC-10	210 Old Plymouth	Upland		N			Roadcut	NA	NA	NA	No evidence of jurisdictional Waters of US on State Mapping
OF-81	BOSCSTRC-02	100 Standish	Upland		N			Roadcut	NA	NA	NA	No evidence of jurisdictional Waters of US on State Mapping
OF-82	BOSCWIRC-01	276 Williston	Upland		N			Roadcut	NA	NA	NA	Does not appear to enter a water of US
OF-152	BOPRABDP-01	Abo Circle	Upland		N			Pipe	NA	NA	NA	No observed connection to waters of the US
OF-151	BOPRLEDP-01	6 Leslie	Upland		N			Pipe	NA	NA	NA	Accepts water off of Harwood
OF-58	BOPRBNRC-01	6 Penninsula	Upland		N			roadcut	NA	NA	NA	No observed connection to waters of the US
OF-53	BOPRBNRC-02	Enterprise Rd & Bennetts neck	Upland		N			roadcut	NA	NA	NA	No observed connection to waters of the US
OF-54	BOPRBNRC-01	46 Bennets neck	Upland		N			roadcut	NA	NA	NA	No observed connection to waters of the US
OF-154	BOPRBNDP-10	44 Bennets Neck	Upland		N			pipe	NA	NA	NA	No observed connection to waters of the US
OF-160	BOHCRODP-01	Rolling Oaks	Upland		N			Pipe	NA	NA	NA	Private Road
OF-228	BOBUHBDP-07	21 Foster Howard	upland		N			Pipe	NA	NA	NA	
OF-252	BOHCRODP-04	Rte 28 Rotary	Upland		N			Pipe	NA	NA	NA	State Road
OF-253	BOHCRODP-06	Rte 28 Rotary	Upland		N			Pipe	NA	NA	NA	State Road
OF-182	BORBCDDP-07	82 Clubhouse Dr	Upland		N			Pipe	NA	NA	NA	Private road
OF-219	BORBCD-09	70 Clubhouse Dr.	Upland		N			Pipe	NA	NA	NA	Private Road
OF-95	BORBRBRC-05	150 Red Brook Harbor Rd	Upland		N			roadcut	NA	NA	NA	Does not appear to be connected to a Waters of US
OF-47	BOSHOARC-01	9 Megansett	Upland		N			Roadcut	NA	NA	NA	Does not appear to be connected to a Waters of US
OF-48	BOSHOARC-02	25 Summit	upland		N			Roadcut	NA	NA	NA	Does not appear to be connected to a Waters of US
OF-33	BOPHHORC-01	15 Howard	Upland		N			roadcut	NA	NA	NA	private road
OF-34	BOPHHORC-02	19 Howard	upland		N			roadcut	NA	NA	NA	private road
OF-36	BOPHTHRC-01	45 Thom	upland		N			roadcut	NA	NA	NA	
OF-37	BOPHTHRC-02	45 Thom	upland		N			roadcut	NA	NA	NA	
OF-38	BOPHTHRC-03	45 Thom	upland		N			roadcut	NA	NA	NA	
OF-39	BOPHTHRC-04	42 Thom	upland		N			roadcut	NA	NA	NA	
OF-31	BOPHCLRC-02	4 sanford	Upland		N				NA	NA	NA	No observed connection to waters of the US
OF-32	BOPHCLRC-01	4 sanford	Upland		N				NA	NA	NA	No observed connection to waters of the US
OF-135	BOPHWEDP-01	7 Westerly	Upland		N			Pipe	NA	NA	NA	private road
OF-136	BOPHWEDP-02	23 Westerly	Upland		N			Pipe	NA	NA	NA	private road
OF-150	BOPHCFDP-01	67 Cliff Road	upland?		N				NA	NA	NA	No observed connection to waters of the US
OF-40	BOPHCLRC-03	61 Clay Pond	Upland?		N			roadcut	NA	NA	NA	No observed connection to waters of the US
OF-41	BOPHCLRC-04	61 Clay Pond	Upland?		N			roadcut	NA	NA	NA	No observed connection to waters of the US
OF-42	BOPHCLRC-05	61 Clay Pond	Upland?		N			roadcut	NA	NA	NA	No observed connection to waters of the US
OF-168	BOPHGRDP-01	3 Grissom Lane	Upland?		N			Pipe	NA	NA	NA	No observed connection to waters of the US
OF-35	BOPHHORC-03	54 Howard	Upland?		N			roadcut	NA	NA	NA	private road

Need Site Review
MS4 Outfall
Non-Jurisdictional

Appendix F. Catch Basin Cleaning Program

TOWN OF BOURNE, MASSACHUSETTS
CATCH BASIN INSPECTION AND CLEANING
STANDARD OPERATING PROCEDURE

This SOP and form are inspection form based on a template that was created by Central Massachusetts Regional Stormwater Coalition for use in municipalities across the state, as provided on the US EPA Region 1 Stormwater MS4 website.

Introduction

Catch basins help minimize flooding and protect water quality by removing trash, sediment, decaying debris, and other solids from stormwater runoff. These materials are retained in a sump below the invert of the outlet pipe. Catch basin cleaning reduces foul odors, prevents clogs in the storm drain system, and reduces the loading of suspended solids, nutrients, and bacteria to receiving waters.

During regular cleaning and inspection procedures, data can be gathered related to the condition of the physical basin structure and its frame and grate and the quality of stormwater conveyed by the structure. Observations such as the following can indicate sources of pollution within the storm drain system:

- Oil sheen
- Discoloration
- Trash and debris

Both bacteria and petroleum can create a sheen on the water surface. The source of the sheen can be differentiated by disturbing it, such as with a pole. A sheen caused by an oil will remain intact and move in a swirl pattern; a sheen caused by bacteria will separate and appear "blocky". Bacterial sheen is not a pollutant, but should be noted.

Observations such as the following can indicate a potential connection of a sanitary sewer to the storm drain system, which is an illicit discharge.

- Indications of sanitary sewage, including fecal matter or sewage odors
- Foaming, such as from detergent
- Optical enhancers, fluorescent dye added to laundry detergent

Each catch basin should be cleaned and inspected at least annually. Catch basins in high-use areas may require more frequent cleaning. Performing street sweeping on an appropriate schedule will reduce the amount of sediment, debris, and organic matter entering the catch basins, which will in turn reduce the frequency with which structures need to be cleaned.

Cleaning Procedure

Catch basin inspection cleaning procedures should address both the grate opening and the basin's sump. Document any and all observations about the condition of the catch basin structure and water quality on the Catch Basin Inspection Form (attached).

An excessive sediment or debris loading is assumed to be a catch basin sump more than 50 percent full. A catch basin sump is more than 50 percent full if the contents within the sump exceed one half of the distance between the bottom interior of the catch basin to the invert of the deepest outlet of the catch basin.

Catch basin inspection and cleaning procedures include the following:

1. Work upstream to downstream.
2. Clean sediment and trash off grate.
3. Visually inspect the outside of the grate.
4. Visually inspect the inside of the catch basin to determine cleaning needs.
5. Inspect catch basin for structural integrity.
6. Determine the most appropriate equipment and method for cleaning each catch basin.
    a. Manually use a shovel to remove accumulated sediments, or
    b. Use a bucket loader to remove accumulated sediments, or
    c. Use a high pressure washer to clean any remaining material out of catch basin while capturing the slurry with a vacuum.
    d. If necessary, after the catch basin is clean, use the rodder of the vacuum truck to clean downstream pipe and pull back sediment that might have entered downstream pipe.
7. If contamination is suspected, chemical analysis will be required to determine if the materials comply with the Massachusetts DEP Hazardous Waste Regulations, 310 CMR 30.000 (http://www.mass.gov/dep/service/regulations/310cmr30.pdf). Chemical analysis required will depend on suspected contaminants. Note the identification number of the catch basin on the sample label, and note sample collection on the Catch Basin Inspection Form.
8. Properly dispose of collected sediments. See the following section for guidance.
9. If fluids collected during catch basin cleaning are not being handled and disposed of by a third party, dispose of these fluids to a sanitary sewer system, with permission of the system operator.
10. If illicit discharges are observed or suspected, notify the appropriate Department (see the IDDE Plan for procedures).
11. At the end of each day, document location and number of catch basins cleaned, amount of waste collected, and disposal method for all screenings.
12. Report additional maintenance or repair needs to the appropriate department.

Disposal of Screenings

The discharge of decant wastewater and/or any other wastewater associated with catch basin maintenance to a watercourse or wetland, or returned to a catch basin or storm drain system, is prohibited. However, catch basin cleanings from storm water-only drainage systems may be disposed at any landfill that is permitted by MassDEP to accept solid waste. MassDEP usually does not require stormwater-only catch basin cleanings to be tested before disposal, unless there is evidence of contamination. Contaminated catch basin cleanings must be evaluated in accordance with the Hazardous Waste Regulations, 310 CMR 30.000, and handled as Hazardous Waste if appropriate. Any cleanings from combined sewers may be required to be tested before disposal

Screenings may need to be placed in a drying bed to allow water to evaporate before proper disposal. In this case, ensure that the screenings are managed to prevent pollution.

In Massachusetts, the only option for reuse of catch basin cleanings is at landfills. As discussed previously, catch basin cleanings must be sufficiently dry and free of decant liquid prior to re-use. Otherwise, the material will need to undergo a Paint Filter Liquids Test. This test consists of placing a predetermined amount of material in a paint filter, and if any material passes through the filter within a five minute period, the material is considered to contain free liquids (EPA, 2004). Once catch basin cleanings are sufficiently dry or have passed the Paint Filter Liquids Test, they may be used as grading and shaping material at landfills undergoing closure. Catch basin cleanings may also be used as a daily cover or grading material at active landfills, but only with specific MassDEP approval of the proposed use.

MassDEP 310 CMR19.130 (7) prohibits Massachusetts landfills from accepting materials with free draining liquids. The agency will generally be satisfied that the material is sufficiently dry if there is no free water in a truck used to transport the catch basin cleanings. Otherwise, the material will need to undergo a Paint Filter Liquids Test. However, catch basin cleanings can be used as grading and shaping material at landfills undergoing closure. The cleanings may be used as a daily cover or grading material at active landfills only with specific MassDEP approval of the proposed use.

CATCH BASIN INSPECTION FORM

Catch Basin I.D.	_____	**Final Discharge from Structure?** Yes ☐ No ☐ **If Yes, Discharge to Outfall No:**_____	
Catch Basin Label:	**Stencil** ☐ **Ground Inset** ☐ **Sign** ☐ **None** ☐ **Other**_____		
Basin Material:	Concrete ☐ Corrugated metal ☐ Stone ☐ Brick ☐ Other: _____ ☐	**Catch Basin Condition:**	Good ☐ Poor ☐ Fair ☐ Crumbling ☐
Pipe Material:	Concrete ☐ HDPE ☐ PVC ☐ Clay Tile ☐ Other:_____	**Pipe Measurements:**	Inlet Dia. (in): d= ____ Outlet Dia. (in): D= ____

Required Maintenance/ Problems (check all that apply):

- ☐ Tree Work Required
- ☐ New Grate is Required
- ☐ Pipe is Blocked
- ☐ Frame Maintenance is Required
- ☐ Remove Accumulated Sediment
- ☐ Pipe Maintenance is Required
- ☐ Basin Undermined or Bypassed
- ☐ Cannot Remove Cover
- ☐ Ditch Work
- ☐ Corrosion at Structure
- ☐ Erosion Around Structure
- ☐ Remove Trash & Debris
- ☐ Need Cement Around Grate

Other: _____

Catch Basin Grate Type :	**Sediment Buildup Depth :**	**Description of Flow:**	**Street Name/ Structure Location:**
Bar: ☐ Cascade: ☐ Other:_____ Properly Aligned: Yes ☐ No ☐	0-6 (in): ____ 6-12(in): ____ 12-18 (in): ____ 18-24 (in): ____ 24 + (in): ____	Heavy ☐ Moderate ☐ Slight ☐ Trickling ☐	

***If the outlet is submerged check yes and indicate approximate height of water above the outlet invert.** h above invert (in):__	Yes ☐	No ☐

☐ **Flow** ☐ **Standing Water** **(check one or both)**	**Observations:** Color: Odor:	**Circle those present:**	
Weather Conditions :	Dry > 24 hours ☐ Wet ☐	Foam	Oil Sheen
Sample of Screenings Collected for Analysis? Yes ☐ No ☐		Sanitary Waste	Bacterial Sheen
Comments:		Orange Staining	Floatables
		Excessive sediment	Pet Waste
		Other:_____	Optical Enhancers

Appendix G. Street Sweeping Program

Standard Operating Procedures *Bourne* *Department of Public Works* **Sweeping Streets and Parking Lots**	**Issue Date:**

Approved by:

Public Works Director (or similar)

Purpose of SOPs:

Procedures for the operation and maintenance of street sweepers, frequency of sweeping, disposal of debris, and recordkeeping to prevent pollution from entering the stormwater sewer systems.

MA Small MS4 General Permit Requirement Summary:

Part 2.3.7.a.iii.3.

The permittee shall establish and implement procedures for sweeping and/or cleaning streets, and permittee-owned parking lots. All streets with the exception of rural uncurbed roads with no catch basins or high speed limited access highways shall be swept and/or cleaned a minimum of once per year in the spring (following winter activities such as sanding). The procedures shall also include more frequent sweeping of targeted areas determined by the permittee on the basis of pollutant load reduction potential, based on inspections, pollutant loads, catch basin cleaning or inspection results, land use, water quality limited or TMDL waters or other relevant factors as determined by the permittee. The permittee shall report in each annual report the number of miles cleaned or the volume or mass of material removed. For rural uncurbed roadways with no catch basins and limited access highways, the permittee shall either meet the minimum frequencies above, or develop and implement an inspection, documentation and targeted sweeping plan with two (2) years of the effective date of the permit, and submit such plan with its year one annual report.

Part 2.3.a.iii.4.

The permittee shall ensure proper storage of catch basin cleanings and street sweepings prior to disposal or reuse such that they do not discharge to receiving waters.

Equipment Inventory:

The following is a list of street sweeping equipment:

Equipment Number	Make	Description	Sweeper Speed (or other notes)
Sweeper 2 (2015)	International TYMCO	Vac Sweeper	5 mph
Sweeper 3 (2000)	Steerling Eagle	Broom Sweeper	5 mph
Sweeper 4 (2009)	Elgin Pelican	Broom Sweeper	5 mph
T-15 Basin (2009)	International 7300	Clam Shell	-
Vac Truck (2019)	International Auqatech	Vac Truck	-

[Expand table as necessary]

Standard Operating Procedures *Bourne* *Department of Public Works* **Sweeping Streets and Parking Lots**	**Issue Date:**

Operations

1. Operate all sweepers and equipment according to the manufacturer's recommended settings, standards, and procedures.

2. While sweeping, drive between the optimal sweeping speed limit, as recorded in the equipment list above.

3. Sweeping will not take place during **rain or snowstorms and between the months of December and February.**

4. If spills occur or illegal discharges are seen, report to ***Dept. of Public Works Director, George Sala***

Maintenance

1. Sweepers will be checked for leaks **after every use.** Immediately contain and properly clean up any spills.

2. Regular preventative maintenance to prolong equipment use (such as greasing moving parts and minor adjustments) occur **daily when in season**.

3. Parts are replaced **as-needed**. Brushes are replaced when bristle length is less than ***five*** inches, or after ***as-needed***.

4. Equipment is washed at **DPW garage** located at **35 Ernest Valeri Dr** to trap grease, oils and sediment.

5. The left-over debris is scraped out from the hopper after **all debris dumps at the end of the day**.

Schedule

1. Street sweeping will primarily take place between the months of **March** and **November**.

2. All streets with curbing and/or catch basins shall be swept a minimum of once per year in the spring (following winter activities such as sanding). Streets are swept according to the street list and schedule located ***35 Ernest Valeri Drive.***

3. Priority roads and parking lots are identified on the basis of pollutant load reduction potential, based on inspections, pollutant loads, catch basin cleaning or inspection results, land use, impaired or TMDL waters or other relevant factors. These roads and parking lots are listed below and will be swept more frequently as indicated in the table.

   These roads/parking lots may be grouped by road category as long as the town's list of streets and parking lots also indicates the applicable road category (e.g. main arterials, residential areas, commercial areas, downtown areas, municipal parking lots, industrial areas, etc.).

Priority Road/ Parking Lot Name (or Category)	Frequency of Sweeping
Main Street	2-3 times year
North Sagamore Village roads: Williston, Old Plymouth, Norris, etc.	2-3 times year
County Road	2-3 times year
Shore Road	2-3 times year

Bournedale Road	2-4 times year
Barlows Landing Road	1-3 times year
Clay Pond Road	1-3 times year
Town Hall	1-2 times year
Bourne Police Station	1-2 times year
Bourne Fire Departments	1-2 times year each
Bourne Public Schools	1-2 times year or as-needed
Sagamore Beach Parking Lots	As-needed
Electric Ave Beach Parking Lot	As-needed
Monument Beach Parking Lot	As-needed
Monk's Park (Valley Bars Rd portion)	As-needed
Hen's Cove Beach Parking Lots	As-needed
Squeteague Harbor Beach Parking Areas	As-needed

[Expand table as necessary]

The list of priority roads and parking lots will be reassessed every **2 years.**

4. The sweeping schedule is assessed ***2*** times per year and updated as necessary.

5. A map of town roads and parking lots is located ***at the Town of Bourne Engineering Department***

6. Events/activities that require special sweeping are ***Capital Construction Projects, Nor'Easter/Hurricane storm events, Special Festival events near the previously mentioned beaches or Cape Cod Canal.***

Storage and Disposal

1. Temporary storage of solid sweeping debris is on an impervious surface or in a truck/dumpster that is protected from runoff. The storage location is ***Town of Bourne Integrated Solid Waste Management Facility (ISWM.)***

2. Solid sweeping debris is brought to ***ISWM*** for permanent disposal. If applicable, solid sweeping debris from ***Roads/Lots*** will be reused as ***ISWM material*** following the MassDEP Reuse and Disposal of Street Sweepings Policy. Debris is permanently disposed of ***after every use and as-needed due to the proximity of ISWM being an in-house operation.***

3. Decant water is discharged to ***ISWM.***

4. Weighing process: The amount of solid sweeping debris will be weighed by ***in-house scale at ISWM***

Training

1. Employees are trained ***2 times*** times per year on this procedure and the proper operation of equipment. Employees are also trained on stormwater pollution prevention, spill and response, and illicit discharge detection and elimination procedures.

Record Keeping

1. Records are kept ***Bourne DPW.***

2. ***Measures—the points of solid debris removed and number of miles swept, along with any other measures recorded*** are recorded after each sweeping.

3. The number of curb miles swept per ***year*** is calculated ***annually.***

4. A list of employees implementing the SOPs and the completion of their training(s) can be found ***at the Bourne DPW.***

Revising the SOPs

1. These procedures are reviewed ***1*** time per year and updated as needed.

Appendix H. Winter Road Maintenance Program

STANDARD OPERATING PROCEDURE BOURNE DEPARTMENT OF PUBLIC WORKS PROGRAM: Snow Removal and De-Icing	SOP NUMBER:	ISSUE DATE:

APPROVED BY:

Public Works Director [or other]

MA SMALL MS4 PERMIT REQUIREMENT SUMMARY:

Part 2.3.7.a.iii.5.
The permittee shall establish and implement procedures for winter road maintenance including the use and storage of salt and sand; minimize the use of sodium chloride and other salts, and evaluate opportunities for use of alternative materials; and ensure that snow disposal activities do not result in disposal of snow into waters of the United States. For purposes of this MS4 Permit, salt shall mean any chloride-containing material used to treat paved surfaces for deicing, including sodium chloride, calcium chloride, magnesium chloride, and brine solutions.

Personnel

The following personnel are responsible for snow and ice removal. Employees performing the procedures in this SOP shall attend yearly stormwater pollution prevention training.

TABLE 1

Name	Responsibility
All essential DPW labor staff	Plow, shovel, de-ice as necessary

Equipment

The municipality owns and maintains ice control and snow removal equipment listed in Table 2. Equipment maintenance shall be conducted consistent with the Vehicles and Equipment maintenance SOP found here: **Bourne DPW, 35 Ernest Valeri Road.** The wash bay/ area is located at: **Bourne DPW**

Plowing
When conditions warrant, plows are installed on the **16** larger trucks to move snow from the traveled roadway. Average time to install a plow is approximately **15** minutes. **14** smaller trucks **28 private contractors** are available for plowing of residential streets and clearing public lots.

Sand Spreaders
When conditions warrant, sand spreaders are installed on the **16** larger trucks to spread sand on the traveled roadway. Each sand spreader is calibrated prior to the deicing season and every **2 weeks** thereafter. Sand spreaders are calibrated to dispense **0.20** cubic yards of sand per lane mile.

Salt Spreaders and Pre-Wetting Devices

When conditions warrant, salt spreaders are installed on the **16** larger trucks to spread salt on the traveled roadway. Each salt spreader is calibrated prior to the deicing season and every **2 weeks** thereafter. Salt application shall be calibrated to dispense rates of **500** pounds per lane mile. **2** of trucks are equipped with pre-wetting brine tanks which are calibrated prior to the deicing season and every **2 weeks** thereafter. Pre-wetting application shall be calibrated to dispense rates **10** gallons of pre-wet liquid to 1 ton of salt.

Anti-Icing Dispensers

The municipality has **2** pieces of equipment for this task. Each is a **2,500** gallon truck-mounted dispenser for anti-icing chemical application. The tanks are mounted on **both trucks** and distributes anti-icing product onto city streets and bridges utilizing spray nozzles in accordance with this SOP. Anti-icing dispensers are calibrated prior to the deicing season and every **2 weeks** thereafter. Anti-icing dispensers shall be calibrated to apply **50** gallons per lane mile Pre-wetting application shall be calibrated to dispense rates are **10** gallons of pre-wet liquid to 1 ton of salt.

TABLE 2

Equipment Number	Make	Description	Additional Equipment	Primary Use
[00001]	*[XXXX]*	*[12-yard dump truck]*	*[4-yard salt spreader. 11' Side-cast plow]*	*[General Salting and Plowing]*
*SEE ATTACHED LIST				

Other Equipment available from other divisions:
[Fill in other equipment here]

Materials

The major materials are used in snow and ice control are coarse sand, coarse salt, anti-icing agent. These materials are stockpiled in advance of an event and are immediately available when needed and stocks are replenished between events.

Sand

Sand is used as an abrasive for traction on slick roadways. Approximately **1,000** cubic yards are anticipated to be used per year and are ordered from **Town of Bourne Integrated Solid Waste Management (ISWM)** prior to each

deicing season. Sand is stored in the covered facility located at: **Bourne DPW 35 Ernest Valeri Drive**. Loading areas and yards are swept **weekly** to prevent sand build-up and run-off.

Salt

Salt is used to expedite the melting of snow and ice from the street surface and also to keep the ice from forming a bond to the street surface. Approximately **1,000** tons of **Sand-Salt mix** are anticipated to be used per year and are ordered from **Champion Salt** prior to each deicing season. Salt is stored in the covered facility located at: **Bourne DPW 35 Ernest Valeri Drive.** Loading areas and yards are swept **weekly or as-needed** to prevent salt build-up and run-off.

Anti-icing and Pre-Wetting Chemical

Approximately **3,000** gallons of **Calcium Chloride** is estimated to be needed for anti-icing application and **3,000** gallons of **Calcium Chloride** is estimated to be needed for pre-wetting. These chemicals are stored at **Bourne DPW 35 Ernest Valeri Drive** in **2,500** gallon storage tanks equipped with appropriate spill control.

Salt Alternatives

Approximately **No Amount** of any **Salt Alternatives** are estimated to be needed for de-icing purposes in environmentally sensitive areas. **N/A**

Procedures

Anti-Icing

1. Whenever possible, the anti-icing product is applied to the roadway prior to the beginning of a storm to prevent snow from bonding to the roadway surface, and also used when heavy frost or black ice is expected to be an issue for commuters. **The Operations Manager (OM)** will instruct staff when anti icing is appropriate. Anti-icing will not be done prior to freezing rain or when pavement temperatures are below ***10*** degrees F.
2. Prior to anti-icing application, equipment will be checked to ensure proper working order and ensure proper calibration of equipment. All fluid levels will be checked and filled to proper levels, all lights must be in working order. A visual walk-around inspection of the truck or equipment must be made. Any repairs must be made and reported to a supervisor or mechanic before leaving the yard.
3. Anti-icing chemical will only be applied to priority routes. The priority routes list is found here: **Bourne DPW 35 Ernest Valeri Dr.**
4. Anti-Icing vehicle optimal speed is 5-30 MPH.
5. Before parking any truck or equipment after use, all fluid levels will be checked and filled. All minor repairs will be done by the operator. Any repairs the operator cannot perform will be written up on the proper forms and turned in to **the OM. The OM** will determine importance and will assign the repairs according to schedule. All deicing chemical will be washed from equipment at the wash bay or designated wash area.

Salt Application

1. Whenever conditions warrant, salt is applied to the roadway prior to accumulation of snow to prevent compacted snow from bonding to the roadway surface. **The OM** will instruct staff when salt application is

appropriate. Salting will not be done when pavement temperatures are above ***32*** degrees F or below 0 degrees F.

2. Prior to salt application, equipment will be checked to ensure proper working order and ensure proper calibration of equipment. All fluid levels will be checked and filled to proper levels, all lights must be in working order. A visual walk-around inspection of the truck or equipment must be made. Any repairs must be made and reported to a supervisor or mechanic before leaving the yard.
3. The standard salt application speed is: **0-30** mph.
4. Follow the prioritized route or schedule. This schedule is located at: **Bourne DPW 35 Ernest Valeri Drive.**
5. Before parking any truck or equipment after use, all fluid levels will be checked and filled. All minor repairs will be done by the operator. Any repairs the operator cannot perform will be written up on the proper forms and turned in to **Vehicle Maintenance Manager (VMM). Vehicle Maintenance Manager** will determine importance and will assign the repairs according to schedule. All deicing chemical will be washed from equipment at the wash bay or designated wash area.

Snow Plowing

1. As the storm develops and **2"** inches of snow has accumulated, all of the drivers and available equipment will begin to plow their assigned routes.
2. Prior to plowing operations, equipment will be checked to ensure proper working order. All fluid levels will be checked and filled to proper levels, all lights must be in working order. A visual walk-around inspection of the truck or equipment must be made. Any repairs must be made and reported to a supervisor or mechanic before leaving the yard.
3. Avoid plowing, pushing, blowing or storing excess snow, deicer, or other debris in or near creeks, watercourses or storm drainage systems.
4. Reduce plowing speed in sensitive areas (near creeks, wetlands or other water courses) to prevent snow and deicing materials from entering waterways.
5. The standard plowing speed is: ***5-30*** mph.
6. Follow the prioritized route or schedule. This schedule is located at: **Bourne DPW, 35 Ernest Valeri Road**
7. Before parking any truck or equipment after use, all fluid levels will be checked and filled. Blades or bolts, which need replacing, will be taken care of unless told to do otherwise. Chains that need repairs will be repaired. All minor repairs will be done by the operator. Any repairs the operator cannot perform will be written up on the proper forms and turned in to **VMM. VMM** will determine importance and will assign the repairs according to schedule.

Sand Application

1. Whenever conditions warrant, sand is applied to the roadway to increase traction. **The OM** will instruct staff when sand application is appropriate. Sanding will not be done when pavement temperatures are above ***30*** degrees F.
2. Prior to sand application, equipment will be checked to ensure proper working order and ensure proper calibration of equipment. All fluid levels will be checked and filled to proper levels, all lights must be in working order. A visual walk-around inspection of the truck or equipment must be made. Any repairs must be made and reported to a supervisor or mechanic before leaving the yard.
3. The standard sanding speed is: **5-25** mph.
4. Follow the prioritized route or schedule. This schedule is located at: **Bourne DPW, 35 Ernest Valeri Rd**.
5. Before parking any truck or equipment after use, all fluid levels will be checked and filled. Blades or bolts, which need replacing, will be taken care of unless told to do otherwise. Chains that need repairs will be

repaired. All minor repairs will be done by the operator. Any repairs the operator cannot perform will be written up on the proper forms and turned in to the **VMM. The VMM** will determine importance and will assign the repairs according to schedule.

Salt Alternative Application – NOT CURRENTLY USED AT THE TOWN OF BOURNE

1. ~~Salt alternatives are used in environmentally sensitive areas and applied to the roadway prior to accumulation of snow to prevent compacted snow from bonding to the roadway surface. **[*enter person or position name*]** will instruct staff when salt alternative application is appropriate.~~
2. ~~Prior to salt alternative application, equipment will be checked to ensure proper working order and ensure proper calibration of equipment. All fluid levels will be checked and filled to proper levels, all lights must be in working order. A visual walk-around inspection of the truck or equipment must be made. Any repairs must be made and reported to a supervisor or mechanic before leaving the yard.~~
3. ~~Salt alternatives will only be applied to priority routes. The priority routes list is found here: **[*enter location of priority routes or list them here*]**.~~
4. ~~Salt alternative delivery optimal speed is **[*insert speed*]** MPH.~~
5. ~~Before parking any truck or equipment after use, all fluid levels will be checked and filled. All minor repairs will be done by the operator. Any repairs the operator cannot perform will be written up on the proper forms and turned in to **[*enter person or position name*]**. **[*enter person or position name*]** will determine importance and will assign the repairs according to schedule. All deicing chemical will be washed from equipment at the wash bay or designated wash area.~~

Record Keeping and Documentation

1. Maintain a master schedule of prioritized snow and sanding routes and the miles or roads plowed or sanded. **Bourne DPW, 35 Ernest Valeri Dr**
2. Keep copies of manufacturer's recommendations for equipment calibration, plowing speed and salt/sand application rates. **Bourne DPW, 35 Ernest Valeri Dr**
3. Keep records of the amounts of salt, sand, liquid deicer, and salt alternatives applied per season**. Bourne DPW, 35 Ernest Valeri Dr**
4. Keep a list of all employees trained in the facility's Stormwater Pollution Prevention binder or computer file.

Appendix I. Structural BMP Inspection and Maintenance

TOWN OF BOURNE, MASSACHUSETTS
STANDARD OPERATING PROCEDURE FOR INSPECTING CONSTRUCTED BEST MANAGEMENT PRACTICES

Best Management Practices (BMPs) are policies, procedures and structures designed to reduce stormwater pollution, prevent contaminant discharges to natural water bodies, and reduce stormwater facility maintenance costs. Constructed BMPs are permanent site features designed to treat stormwater before infiltrating it to the subsurface or discharging it to a surface water body.

This Standard Operating Procedure (SOP) provides a general summary of inspection procedures for eight common constructed BMPs, including:

1. Bioretention Areas and Rain Gardens
2. Constructed Stormwater Wetlands
3. Extended Dry Detention Basins
4. Proprietary Media Filters
5. Sand and Organic Filters
6. Wet Basins
7. Dry Wells
8. Infiltration Basins

This SOP and inspection forms provided at the end of this document are based on a template that was created by Central Massachusetts Regional Stormwater Coalition for use in municipalities across the state. This SOP is based on the Massachusetts Stormwater Handbook and is not intended to replace that document. This SOP is also not intended to replace the Stormwater BMP Operation and Maintenance (O&M) Plan required by the Massachusetts Wetlands Protection Act, Order of Conditions.

Bioretention Areas and Rain Gardens

Bioretention areas and rain gardens are shallow depressions filled with sandy soil, topped with a thick layer of mulch and planted with dense native vegetation. There are two types of bioretention cells:

1. Filtering bioretention area: Areas that are designed solely as an organic filter; and
2. Exfiltration bioretention area: Areas that are configured to recharge groundwater in addition to acting as a filter.

Inspection & Maintenance

Regular inspection and maintenance are important to prevent against premature failure of bioretention areas or rain gardens. Regular inspection and maintenance of pretreatment devices and bioretention cells for sediment buildup, structural damage and standing water can extend the life of the soil media.

Maintenance Schedule: Bioretention Areas and Rain Gardens

Activity	Time of Year	Frequency
Inspect for soil erosion and repair	Fall and Spring	Bi-annually
Inspect for invasive species and remove if present	Fall and Spring	Bi-annually
Remove trash	Year round	Monthly
Mulch Void Areas	Year round	Annually
Remove dead vegetation	Fall and Spring	Bi-Annually
Replace dead vegetation	Spring	Annually
Prune	Spring or Fall	Annually
Replace all media and vegetation	Late Spring/Early Summer	As Needed

When failure is discovered, excavate the bioretention area, scarify the bottom and sides, replace the filter fabric and soil, replant vegetation and mulch the surface.

Never store snow within a bioretention area or rain garden. This would prevent required water quality treatment and the recharge of groundwater.

Constructed Stormwater Wetlands

Constructed stormwater wetlands maximize the pollutant removal from stormwater through the use of wetland vegetation uptake, retention and settling. Constructed storm water wetlands must be used in conjunction with other BMPs, such as sediment forebays.

Inspection & Maintenance

Regular inspection and maintenance are important to prevent against premature failure of bioretention areas or rain gardens. Regular inspection and maintenance of pretreatment devices and bioretention cells for sediment buildup, structural damage and standing water can extend the life of the soil media.

Constructed Stormwater Wetlands will be under the care and custody of the Conservation Commission and will be reviewed on a periodical basis to assess the overall health and function of each individual BMP.

Maintenance Schedule, Constructed Stormwater Wetlands: Years 0-3

Activity	Time of Year	Frequency
Inspect for invasive species and remove if present	Year round	Bi-Annually

Maintenance Schedule, Constructed Stormwater Wetlands: Years 4-Lifetime

Activity	Time of Year	Frequency
Inspect for invasive species and remove if present	Year round	Annually
Clean forebays	Year round	Annually

Clean sediment in basin/wetland system	Year round	Once every 10 years
Mulch Void Areas	Spring	Annually
Remove dead vegetation	Fall and Spring	Bi-Annually
Replace dead vegetation	Spring	Annually
Prune	Spring or Fall	Annually
Replace all media and vegetation	Late Spring/Early Summer	As Needed

When failure is discovered, excavate the bioretention area, scarify the bottom and sides, replace the filter fabric and soil, replant vegetation and mulch the surface.

Never store snow within a constructed stormwater wetland. This would prevent required water quality treatment and the recharge of groundwater.

Extended Dry Detention Basins

Extended dry detention basins are designed to control both stormwater quantity and quality. These BMPs are designed to hold stormwater for at least 24 hours, allowing solids to settle and to reduce local and downstream flooding. Pretreatment is required to reduce the potential for overflow clogging. The outflow may be designed as either fixed or adjustable. Additional nutrient removal may be achieved by a micropool or shallow marsh.

Inspection & Maintenance

Annual inspection of extended dry detention basins is required to ensure that the basins are operating properly. Potential problems include: erosion within the basin and banks, tree growth on the embankment, damage to the emergency spillway and sediment accumulation around the outlet. Should any of these problems be encountered, necessary repairs should be made immediately.

Maintenance Schedule: Extended Dry Detention Basins

Activity	Time of Year	Frequency
Inspect basins	Spring and Fall	Bi-Annually, and during and after major storms
Examine outlet structure for clogging or high outflow release velocities	Spring and Fall	Bi-Annually
Mow upper stage, side slopes, embankment and emergency spillway	Spring through Fall	Bi-Annually
Remove trash and debris	Spring	Bi-Annually
Remove sediment from basin	Year round	At least once every 5 years

Proprietary Media Filters

Media Filters are designed to reduce total suspended solids and other target pollutants, such as organics, heavy metals or nutrients, which are absorbed onto the filter media, which is contained in a concrete structure. The substrate used as filter media depends on the target pollutants, and may consist of leaf compost, pleated fabric, activated charcoal, perlite, amended sand in combination with perlite, and zeolite. Two types of Media Filters are manufactured: Dry Media Filters, which are designed to dewater within 72 hours; and Wet Media Filters, which maintain a permanent pool of water as part of the treatment system.

Inspection & Maintenance

Maintenance in accordance with the manufacturer's requirements is necessary to ensure stormwater treatment. Inspection or maintenance of the concrete structure may require OSHA confined space training. Dry Media Filters are required to dewater in 72 hours, thus preventing mosquito and other insect breeding. Proper maintenance is essential to prevent clogging. Wet Media Filters require tight fitting seals to keep mosquitoes and other insects from entering and breeding in the permanent pools. Required maintenance includes routine inspection and treatment.

Maintenance Schedule: Proprietary Media Filters

Activity	Time of Year	Frequency
Inspect for standing water, trash, sediment and clogging	Per manufacturer's schedule	Bi-Annually (minimum)
Remove trash and debris	N/A	Each Inspection
Examine to determine if system drains in 72 hours	Spring, after large storm	Annually
Inspect filtering media for clogging	Per manufacturer's schedule	Per manufacturer's schedule

Sand and Organic Filters

Sand and organic filters, also known as filtration basins, are intended for quality control rather than quantity control. These filters improve water quality by removing pollutants through a filtering media and settling pollutants on top of the sand bed and/or in a pretreatment basin. Pretreatment is required to prevent filter media from clogging. Runoff from the filters is typically discharged to another BMP for additional treatment.

Inspection & Maintenance

If properly maintained, sand and organic filters have a long design life. Maintenance requirements include raking the sand and removing sediment, trash and debris from the surface of the BMP. Over time, fine sediments will penetrate deep into the sand requiring replacement of several inches or the entire sand layer. Discolored sand is an indicator of the presence of fine sediments, suggesting that replacement of the sand should be completed.

Maintenance Schedule: Proprietary Media Filters

Activity	Frequency
Inspect filters and remove debris	After every major storm for the first 3 months after construction completion. Every 6 months thereafter.

Wet Basins

Wet basins are intended to treat stormwater quality through the removal of sediments and soluble pollutants. A permanent pool of water allows sediments to settle and removes the soluble pollutants, including some metals and nutrients. Additional dry storage is required to control peak discharges during large storm events, and if properly designed and maintained wet basins can add fire protection, wildlife habitat and aesthetic values to a property.

Inspection & Maintenance

To ensure proper operation, wet basin outfalls should be inspected for evidence of clogging or excessive outfall releases. Potential problems to investigate include erosion within the basin and banks, damage to the emergency spillway, tree growth on the embankment, sediment accumulation around the outlet and the emergence of invasive species. Should any of these problems be encountered, perform repairs immediately. An on-site sediment disposal area will reduce sediment removal costs.

Maintenance Schedule: Wet Basins

Activity	Time of Year	Frequency
Inspect wet basins	Spring and/or Fall	Annually (Minimum)
Mow upper stage, side slopes, embankment and emergency spillway	Spring through Fall	Bi-Annually (Minimum)
Remove sediment, trash and debris	Spring through Fall	Bi-Annually (Minimum)
Remove sediment from basin	Year round	As required, but at least once every 10 years

Dry Wells

Dry wells are used to infiltrate uncontaminated runoff. These BMPs should never be used to infiltrate stormwater or runoff that has the potential to be contaminated with sediment and other pollutants. Dry wells provide groundwater recharge and can reduce the size and cost required of downstream BMPs or storm drains. However, they are only applicable in drainage areas of less than one acre and may experience high failure rates due to clogging.

Inspection & Maintenance

Proper dry well function depends on regular inspection. Clogging has the potential to cause high failure rates. The water depth in the observation well should be measured at 24 and 48 hour intervals after a storm and the clearance rate calculated. The clearance rate is calculated by dividing the drop in water level (inches) by the time elapsed (hours).

Maintenance Schedule: Dry Wells

Activity	Frequency
Inspect dry wells	After every major storm for the first 3 months after construction completion. Annually thereafter.

Infiltration Basins

Infiltration basins are designed to contain stormwater quantity and provide groundwater recharge. Pollution prevention and pretreatment are required to ensure that contaminated stormwater is not infiltrated. Infiltration basins reduce local flooding and preserve the natural water balance of the site, however high failure rates often occur due to improper siting, inadequate pretreatment, poor design and lack of maintenance.

Inspection & Maintenance

Regular maintenance is required to prevent clogging, which results in infiltration basin failure. Clogging may be due to upland sediment erosion, excessive soil compaction or low spots. Inspections should include signs of differential settlement, cracking, erosion, leakage in the embankments, tree growth on the embankments, riprap condition, sediment accumulation and turf health.

Maintenance Schedule: Infiltration Basins

Activity	Time of Year	Frequency
Preventative maintenance	Spring and Fall	Bi-Annually
Inspection	Spring and Fall	After every major storm for the first 3 months after construction completion. Bi-annually thereafter and discharges through the high outlet orifice.
Mow/rake buffer area, side slopes and basin bottom	Spring and Fall	Bi-Annually
Remove trash, debris and organic matter	Spring and Fall	Bi-Annually

INSPECTION OF BIORETENTION AREAS / RAIN GARDENS

General Information

BMP Description	Bioretention Area / Rain Garden		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect for soil erosion and repair	Monthly	Yes ☐ No ☐	
Inspect for invasive species and remove if present	Monthly	Yes ☐ No ☐	
Remove trash	Monthly	Yes ☐ No ☐	
Mulch void areas	Annually	Yes ☐ No ☐	
Remove dead vegetation	Bi-Annually	Yes ☐ No ☐	
Replace dead vegetation	Annually	Yes ☐ No ☐	
Prune	Annually	Yes ☐ No ☐	
Replace all media and vegetation	As Needed	Yes ☐ No ☐	

INSPECTION OF CONSTRUCTED STORMWATER WETLANDS
Years 0-3 of Operation

General Information

BMP Description	Constructed Stormwater Wetland		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect for invasive species and remove if present	Monthly	Yes ☐ No ☐	
Replace all media and vegetation	As Needed	Yes ☐ No ☐	

In addition, the following information should be recorded and mapped at least once per year:

- Types and distribution of dominant wetland plants
- Presence and distribution of planted wetland species
- Presence and distribution of invasive species
- Indications other species are replacing planted wetland species
- Percent of standing water that is not vegetated
- Replace all media and vegetation
- Stability of original depth zones and micro-topographic features
- Accumulation of sediment in the forebay and micropool and survival rate of plants

INSPECTION OF CONSTRUCTED STORMWATER WETLANDS
Year 4 - Lifetime of Operation

General Information

BMP Description	Constructed Stormwater Wetland		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect for invasive species and remove if present	Monthly	Yes ☐ No ☐	
Clean forebays	Annually	Yes ☐ No ☐	
Clean sediment in basin/wetland system	Once every 10 years	Yes ☐ No ☐	
Mulch void areas	Annually	Yes ☐ No ☐	
Remove dead vegetation	Bi-Annually	Yes ☐ No ☐	
Replace dead vegetation	Annually	Yes ☐ No ☐	
Prune	Annually	Yes ☐ No ☐	
Replace all media and vegetation	As Needed	Yes ☐ No ☐	

INSPECTION OF EXTENDED DRY DETENTION BASINS

Inspections should be conducted bi-annually, and during and after major storm events.

General Information

BMP Description	Extended Dry Detention Basin		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Examine outlet structure for clogging or high outflow release velocities	Bi-Annually	Yes ☐ No ☐	
Mow upper stage, side slopes, embankment and emergency spillway	Bi-Annually	Yes ☐ No ☐	
Remove trash and debris	Bi-Annually	Yes ☐ No ☐	
Remove sediment from basin	At least once every 5 years	Yes ☐ No ☐	

INSPECTION OF PROPRIETARY MEDIA FILTERS

General Information

BMP Description	Media Filter		
BMP Location			
Media Type			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Inspect for standing water, trash, sediment and clogging	Bi-Annually (minimum)	Yes ☐ No ☐	
Remove trash and debris	Each Inspection	Yes ☐ No ☐	
Examine to determine if system drains in 72 hours	Annually	Yes ☐ No ☐	
Inspect filtering media for clogging	Per manufacturer's schedule	Yes ☐ No ☐	

INSPECTION OF SAND AND ORGANIC FILTERS

Inspections should be conducted after every major storm event for the first 3 months following completion, then every 6 months thereafter.

General Information

BMP Description	Sand/Organic Filter		
BMP Location			
Media Type			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Remove sediment, trash, and debris	Every 6 months	Yes ☐ No ☐	
Rake sand	Every 6 months	Yes ☐ No ☐	

INSPECTION OF DRY WELLS

Regular inspections should be conducted after every major storm event for the first 3 months following completion, then annually thereafter.

General Information

BMP Description	Dry Well		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			
Describe condition of dry well at time of inspection			

After a major storm event, the water depth in the observation well should be measured at 24 and 48 hour intervals and the clearance rate calculated.

INSPECTION OF WET BASINS

Inspections should be conducted after every major storm event for the first 3 months following completion, then biannually thereafter.

General Information

BMP Description	Wet Basin		
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			
Describe condition of wet basin at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
Preventative maintenance	Bi-Annually	Yes ☐ No ☐	
Mow/rake buffer area, side slopes and basin bottom	Bi-Annually	Yes ☐ No ☐	
Remove trash, debris and organic matter	Bi-Annually	Yes ☐ No ☐	
Inspect and clean pretreatment devices	Every other month and after every major storm event	Yes ☐ No ☐	

INSPECTION OF OTHER BMP

General Information

BMP Description			
BMP Location			
Inspector's Name			
Date of Inspection		Date of Last Inspection	
Start Time		End Time	
Type of Inspection: Regular ☐ Pre-Storm Event ☐ During Storm Event ☐ Post-Storm Event ☐			
Describe the weather conditions at time of inspection			

Specific Information

Maintenance Activity	Maintenance Frequency	Is Status of BMP Satisfactory?	Corrective Action Needed
		Yes ☐ No ☐	
		Yes ☐ No ☐	
		Yes ☐ No ☐	
		Yes ☐ No ☐	
		Yes ☐ No ☐	
		Yes ☐ No ☐	
		Yes ☐ No ☐	