DRAFT RESTORATION PLAN
for
COMMON LOON (*Gavia immer*) and OTHER BIRDS IMPACTED BY THE BOUCHARD BARGE 120 (B-120) OIL SPILL

BUZZARDS BAY
MASSACHUSETTS and RHODE ISLAND

August 29, 2019

Prepared by:

United States Fish and Wildlife Service

Massachusetts Executive Office of Energy and Environmental Affairs

Rhode Island Department of Environmental Management

and

National Oceanic and Atmospheric Administration
(Lead Administrative Trustee)

Executive Summary

In April 2003, the Bouchard Barge-120 (B-120) oil spill (the Spill) affected more than 100 miles of Buzzards Bay and its shoreline and nearby coastal waters in both Massachusetts (MA) and Rhode Island (RI). Birds were exposed to and ingested oil, as they foraged, nested, and/or migrated through the area. Species of birds estimated to have been killed in the greatest numbers included common loon (*Gavia immer*), common and roseate terns (*Sterna hirundo* and *S. dougallii*), and other birds such as common eider (*Somateria mollissima*), black scoter (*Melanitta americana*), and red-throated loon (*G. stellata*).

The National Oceanic and Atmospheric Administration (NOAA), U.S. Department of the Interior (DOI) (acting through the U.S. Fish and Wildlife Service [USFWS]), the Commonwealth of Massachusetts (acting through the Executive Office of Energy and Environmental Affairs [EEA]), and the State of Rhode Island serve as the natural resource Trustees (Trustees) responsible under the Oil Pollution Act of 1990 (OPA) (33 U.S.C. section 2701, *et seq*.) for ensuring the natural resource injuries that resulted from the Spill are restored. As a designated Trustee, each agency is authorized to act on behalf of the public under State[1] and/or Federal law to assess and recover natural resource damages, and to plan and implement actions to restore, rehabilitate, replace, or acquire the equivalent of the natural resources or services injured or lost as a result of an unpermitted discharge of oil.

After more than 5 years spent assessing impacts to natural resources resulting from the Spill, in November 2010, the Trustees and the Bouchard Transportation Company, Inc., the Responsible Party for the Spill, negotiated a mutually agreeable settlement for a portion of natural resource damages, including shoreline and aquatic resources, piping plovers, and lost natural resource uses. In January of 2018, the Trustees and Responsible Party negotiated a second consent decree for the remaining natural resources injured as a result of the Spill, which included common loon, common and roseate terns, and all other affected bird species.

The purpose of restoration is to offset harm to the environment and to make the public "whole" for injuries resulting from the spill by implementing one or more restoration actions that return injured natural resources and services to baseline conditions and compensate for interim losses. Through the development of Draft and Final Restoration Plans consistent with guidance in OPA and the National Environmental Policy Act (NEPA) (42 U.S.C. §§ 4321- 4347), the Trustees identify and evaluate preferred restoration alternatives and provide the public with an opportunity for review and comment.

Restoration of shoreline and aquatic resources, lost recreational uses and piping plovers was addressed in prior restoration plans (NOAA et al. 2014; USFWS et al. 2012). This Draft Restoration Plan (Draft RP) is intended to provide compensatory restoration for injuries to common loon and all other remaining bird species affected by the Spill, with the exception of common and roseate

[1] MA General Law Chapter 21E, Section 5 and Chapter 21A, Section 2A, and RI General Law, Section 46-12.5.1.

terns. A separate restoration plan for common and roseate terns will be prepared following additional restoration project alternative analyses for those species.

Throughout the injury assessment and restoration planning process, the Trustees consulted with Federal and State wildlife agency experts, as well as organizations and individuals familiar with common loon and other injured bird species. These experts and organizations provided input on injury estimations and potential restoration alternatives. This Draft RP is provided to the public to both fully explain the injury assessment process and gain additional input from the public on the proposed restoration alternatives. The Draft RP has been prepared by the USFWS, the Commonwealth of Massachusetts and the State of Rhode Island, with administrative assistance from NOAA, acting as the Lead Administrative Trustee (LAT).

Using evaluation criteria mandated in OPA (15 CFR §990.54), as well as additional factors to help ensure successful restoration, the Trustees evaluated a number of potential restoration alternatives. The preferred restoration alternatives include specific restoration projects in two categories of injured birds: (1) common loon and (2) other birds injured during the Spill. A suite of projects (e.g., translocation, rafts, signs and wardening, breeding habitat protection, and outreach and lead tackle exchange programs) is proposed to restore the loss to common loon; and two alternatives (habitat protection and common eider nest site management) are proposed to restore the loss to other bird species. The USFWS, the Commonwealth of Massachusetts and the State of Rhode Island recommend the following restoration alternatives and proposed funding levels:

Project ID Number	Proposed Activity	Trustee Funding/Contribution
Common Loon Restoration		
COLO-1	Common Loon Restoration through Translocation and Captive Rearing	$3,185,000
COLO-2	Common Loon Restoration through Artificial Nest Sites, Signage and Wardening, Protection of Breeding Habitat, and Reducing Exposure to Lead Tackle	$3,185,000
Other Bird Restoration		
OB-1	Habitat Protection	
OB-1MA	Massachusetts	$500,000
OB-1RI	Rhode Island	$1,274,000
OB-2MA	Common Eider Nest Site Management	$100,000
Total*		$8,244,000

* Total includes current interest earned on settlement funds; additional interest may be allocated to projects as well as trustee administrative and oversight costs.

The public is invited to review and submit comments on the Draft RP through October 31, 2019. Comments on the Draft RP should be submitted in writing to:

USFWS
Attention: Molly Sperduto
70 Commercial Street, Suite 300
Concord, New Hampshire 03301
molly_sperduto@fws.gov

The Trustees will review and consider the comments received during the comment period, and further evaluate their responsibilities under NEPA prior to releasing the Final Restoration Plan. Implementation of the selected restoration alternatives is expected to begin in late 2019.

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1. Introduction

1.1. Project Purpose

The purpose of the proposed restoration action, as discussed in this document as a set of project alternatives, is to compensate for natural resource injuries to migratory birds resulting from the April 2003 Bouchard Barge-120 (B-120) oil spill (the Spill) that released 98,000 gallons of No. 6 fuel oil to Buzzards Bay, and contiguous coastal waters and shoreline in Massachusetts and Rhode Island. Restoration of other injured natural resources (e.g., shoreline and aquatic resources, lost recreational uses and piping plovers) were addressed in prior restoration plans (NOAA et al. 2014; USFWS et al. 2012). The proposed projects herein are intended to provide compensatory restoration that addresses injuries to common loon (*Gavia immer*) and all other remaining bird species (hereafter referred to as "other birds") affected by the Spill with the exception of common tern (*Sterna hirundo*) and roseate tern (*S. dougallii*). A separate restoration plan for common and roseate terns will be prepared following additional restoration project alternative analyses for those species.

1.2. Need for Action

Following the Spill, more than 100 miles (161 km) of coastal shoreline, including tidal marshes and intertidal flats, aquatic resources, including water column and benthic sub-tidal habitats and benthic communities, and shellfish, fish, birds and other aquatic biota were oiled. Birds were exposed to and ingested oil, as they foraged, nested, and/or migrated through the area. Four hundred and ninety nine (499) oiled birds were collected; however, the overall mortality was estimated to be 1,174 adult birds (accounts for birds that were not collected due to scavenging, drifting out to sea, etc.). Birds estimated to have been killed in the greatest numbers included common loon (531), common (25) and roseate (9) terns, and other birds such as common eider (*Somateria mollissima*, 83), black scoter (*Melanitta americana*, 77), and red-throated loon (*G. stellata*, 83). More detailed information on the Spill incident and the natural resource injuries is provided in Section 1.6. below.

Federal Trustee agencies for this Spill include the National Oceanic and Atmospheric Administration (NOAA, as Lead Administrative Trustee) and the U.S. Fish and Wildlife Service (USFWS). State Trustees include the Commonwealth of Massachusetts and the State of Rhode Island. Collectively, and in accordance with the Oil Pollution Act (OPA) of 1990, the Bouchard B-120 Trustees (Trustees) use recovered damages to restore, rehabilitate, replace or acquire the equivalent of the injured natural resources and services that result from incidents involving a discharge or substantial threat of a discharge of oil to the environment.

Prior to expending funds for restoration, the OPA Natural Resource Damage Assessment (NRDA) regulations require trustees to develop a Restoration Plan (RP) for public review and comment (15 CFR §990.55). The NRDA regulations also require the Trustees to consider a reasonable range of restoration alternatives that would make the environment and public whole (15 CFR §990.53). This document serves as the Draft RP for addressing injuries to common loon and other birds attributed to the Spill.

In addition, this document has been developed in consideration of the National Environmental Policy Act (NEPA) (42 U.S.C. §4321 *et seq.*) and the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 C.F.R. Parts 1500-1508). Under NEPA, Federal agencies must evaluate the potential environmental impacts of proposed Federal actions on the quality of the human environment. Since this Draft RP exclusively focuses on migratory birds, and the USFWS is the designated Federal Trustee for migratory birds, the Trustees have authorized the USFWS to be the lead Federal agency for NEPA compliance for this Draft RP. The Commonwealth of Massachusetts and the State of Rhode Island also have trustee responsibilities for birds and are designated cooperating agencies. NOAA has no trust resources addressed by this Draft RP. As the Lead Administrative Trustee (LAT), NOAA has provided administrative support to the Co-Trustees developing this document. NEPA compliance is discussed further in Section 4.

1.3. Overview of Incident

On April 27, 2003, the Bouchard B-120, owned and operated by the Bouchard Transportation Company, Inc., struck a rocky shoal soon after entering the western approach to Buzzards Bay (Figure 1). The grounding resulted in a 12-foot rupture in the hull of the barge, releasing approximately 98,000 gallons of No. 6 fuel oil into the Bay. More than 100 miles (161 km) of shoreline were affected, including shoreline and coastal waters in both Massachusetts and Rhode Island. The oil was spread and driven ashore by winds and currents, and primarily affected the north, northwest, and northeast portions of the Bay, including shoreline in the towns of Westport, Dartmouth, New Bedford, Fairhaven, Mattapoisett, Marion, Wareham, Gosnold, Bourne, and Falmouth, Massachusetts (Figure 2). Oil continued to be transported throughout Buzzards Bay and nearby coastal waters. Oiling was unevenly distributed and was particularly concentrated at exposed shoreline headlands and peninsulas in discrete, localized areas (e.g., Barneys Joy Point and Mishaum Point in South Dartmouth; West Island, Sconticut Neck, and Long Island in Fairhaven). Shoreline oiling was also reported on the Elizabeth Islands along the southern portion of Buzzards Bay and portions of the Rhode Island shoreline (e.g., Little Compton and Block Island).

The Buzzards Bay shoreline is comprised of diverse shoreline types, including sand and cobble beaches, rocky shores, tidal wetlands, and sand/mudflats under both public and private ownership. Approximately one-quarter of the affected shoreline was determined to be moderately-to-heavily-oiled while the remaining three-quarters of affected shoreline incurred very light or light oiling (Figure 2).

Due to the timing of the Spill (during spring migration) and the oiling of extensive coastal waters and shoreline habitats, a large number and wide variety of birds, including terns and other shorebirds, loons, sea ducks, and waterfowl were exposed to oil following the Spill. The Trustees worked with emergency responders, contractors, and volunteers to collect live and dead oiled birds in the spill area. In the weeks following the Spill, 499 birds were collected (315 dead and 184 live). Of the live birds, 20 were rehabilitated and returned to the wild. Coordinated wildlife reconnaissance and collection of oiled animals began on April 30, 2003, and continued daily through May 16, 2003. Less frequent efforts continued from May 17 through June 6, 2003. Search teams consisted of representatives from USFWS, the Massachusetts Division of Fisheries and Wildlife (MassWildlife), the Responsible Party, and many volunteers.

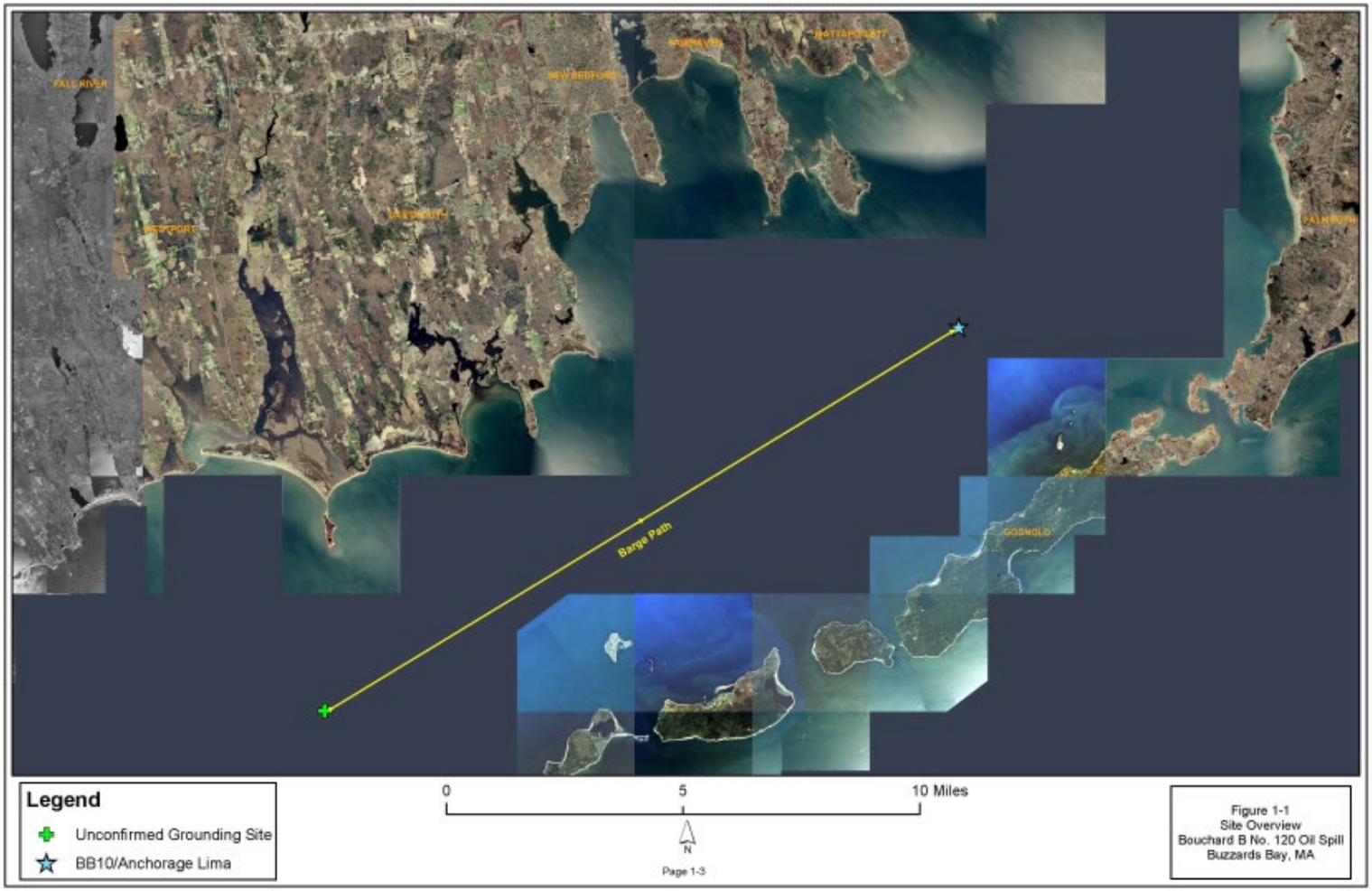

Figure 1. Grounding site and travel pathway of Bouchard Barge-120, resulting in Buzzards Bay oil spill.

(Source: Massachusetts Executive Office of Environmental Affairs [MA-EEA] et al. 2005)

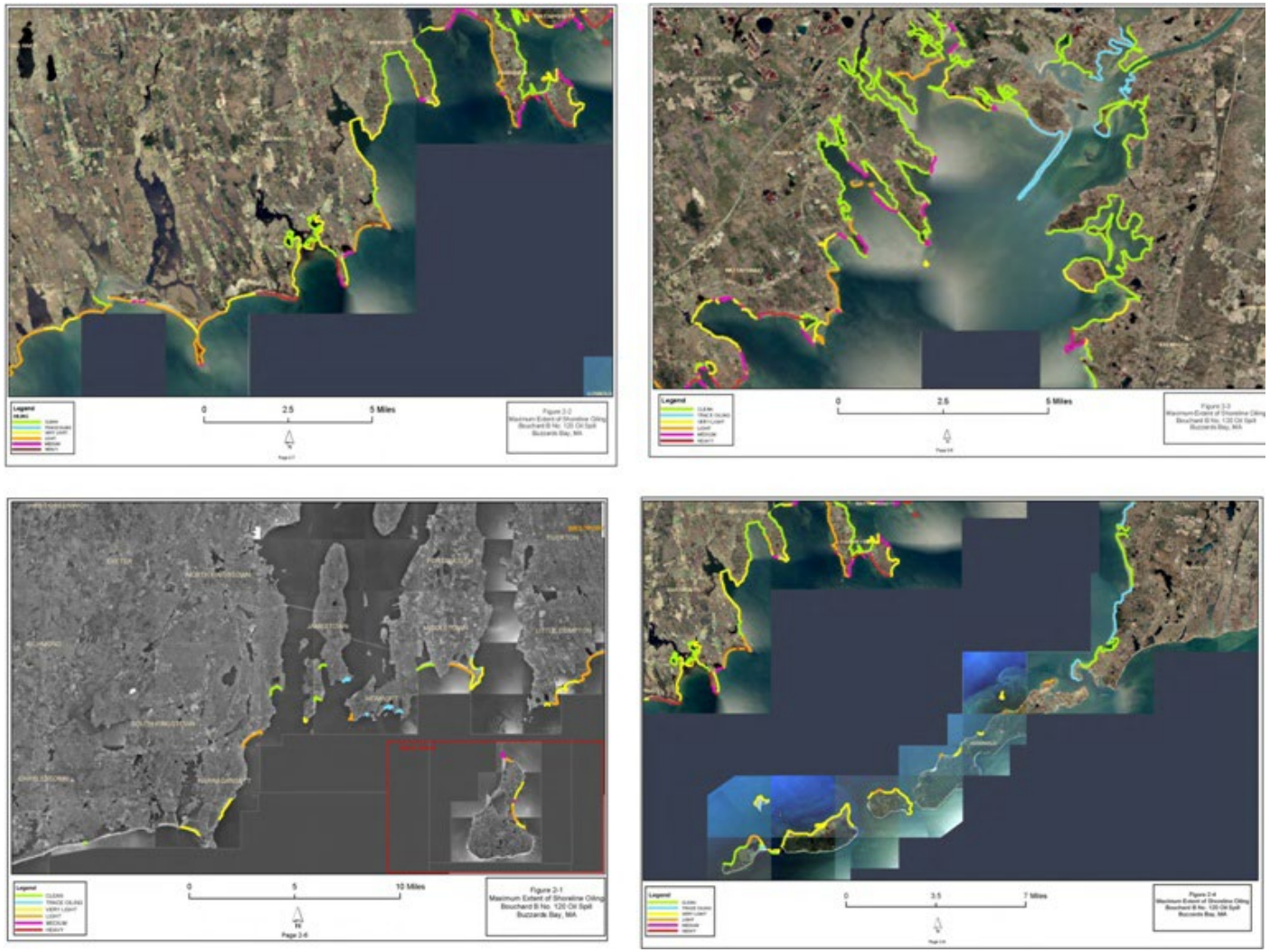

Figure 2. Extent of oiling resulting from the Bouchard B-120 grounding.

(Source: MA-EEA et al. 2005)

Response efforts also focused on Ram Island, a small, uninhabited island in Mattapoisett, Massachusetts that provides breeding habitat for the common tern and federally endangered roseate tern. Early in the spill response effort, booms and sorbent material were placed around Ram Island in an attempt to prevent oiling of this tern colony site.

1.4. Natural Resource Damage Assessment

Soon after the spill event, the Trustees commenced the Pre-assessment Phase of the Natural Resources Damage Assessment in accordance with OPA and NRDA regulations to determine if jurisdiction existed to pursue restoration and, if so, whether it was prudent to do so. A primary purpose of the OPA is to make the environment and public "whole" for injuries to natural resources and services that result from incidents involving a discharge or substantial threat of a discharge of oil to the environment. This mandate is carried out by first returning the injured natural resources and services to the condition in which they would have existed if the incident had not occurred (known as "baseline conditions"). This objective may be accomplished through natural recovery of the injury and/or with human intervention. Trustees must also consider compensatory restoration actions to compensate for the interim loss of natural resources and services pending recovery (15 CFR 990.53(c)(1)).

Based on the Trustees analyses of data collected during the initial spill response and Pre-assessment Phase (e.g., documentation of oiled and dead birds, which included federally listed threatened and endangered bird species), the Trustees determined that there was jurisdiction to pursue restoration under OPA, and that pursuing restoration under OPA was appropriate. Analyses are available in MA-EEA et al. 2005. The Trustees further determined that the spill response clean-up actions had not adequately addressed the restoration of natural resource injuries resulting from the incident, and feasible primary and/or compensatory restoration actions were available and required to address the injuries. These determinations were memorialized in a Notice of Intent to Conduct Restoration Planning. The Notice was signed on July 21, 2006, and NOAA published the Notice in the Federal Register on July 28, 2006 (refer to Federal Register Vol. 71, No. 145, pp. 42812- 42814). As a result, the Trustees initiated the Restoration Planning phase of the NRDA, which includes evaluating and quantifying injuries through an injury assessment, and then using the quantified results to determine the need for and scale of the restoration action(s) to compensate for the injuries (15 CFR 990.50).

Relatedly, but separate from the NRDA process, the Responsible Party also pled guilty to violating the Clean Water Act and the Migratory Bird Treaty Act on March 29, 2004 (United States of America v. Bouchard Transportation Company, Inc., March 29, 2004, U.S. District Court, District of Massachusetts). As part of a settlement for those violations, the Responsible Party paid $7 million to the North American Wetlands Conservation Fund for conservation efforts and $2 million to the Oil Spill Liability Trust Fund to assist with cleanup costs in future oil spills where the Responsible Party is unknown.

1.5. Coordination

1.5.1. Trustee Council Organization and Activities

OPA, Executive Orders 12580 and 12777, and 40 CFR § 300.600 provide for or designate the Federal, State, and Tribal Trustees for natural resources affected by oil spills. The Secretary of the Department of the Interior (DOI) is the designated Federal Trustee for certain natural resources including, but not limited to, migratory birds, certain marine mammals, anadromous fish, federally endangered and threatened species, their respective habitats, and Federal lands managed by DOI. The Secretary of Interior designated the Northeast Regional Director of the USFWS to act on behalf of the Secretary as the Authorized Official for the Spill. NOAA, pursuant to authority delegated by the Secretary of Commerce, is a designated Federal Trustee for certain natural resources, including living marine resources and their habitats (e.g., marine, estuarine and diadromous fishes, other aquatic biota, and certain marine mammals).

The aforementioned Executive Orders and Federal regulations also provide that each state is the designated Trustee for all natural resources within its boundaries. The governor of each state designates the state agency or agencies that will act as the natural resource trustee for each particularly affected state. For the Spill, the Governor of Massachusetts designated the Secretary of the MA-EEA as the Trustee for the Commonwealth.[2] The MA-EEA is supported by the Massachusetts Department of Environmental Protection (MassDEP), which administers the State's NRDA Program. The Governor of Rhode Island designated the Rhode Island Department of Environmental Management (RIDEM) as the State's natural resource Trustee.

Lastly, federally recognized Indian Tribes are Trustees for natural resources belonging to, managed by, controlled by, or appertaining to the Tribes. Early in the injury assessment phase of the Spill, the Wampanoag Tribe of Gay Head (the Aquinnah) reached a separate settlement with the Responsible Party. Therefore, the Wampanoag Tribe is not a party to this restoration planning effort.

To memorialize the ongoing collaborative interagency efforts to accomplish the common goals of natural resource damage assessment and restoration, the Trustees entered into a Memorandum of Agreement (MOA), executed in March 2007. The MOA serves as a framework for coordination and cooperation among the Trustees to accomplish the following: (1) ensure timely and efficient implementation of a NRDA to address resource injuries, including service losses, caused by the Spill; (2) avoid duplication of assessment costs and otherwise ensure costs are reasonable; (3) seek compensation for resource injuries or losses, including reimbursement of assessment costs; and (4) provide for appropriate restoration, rehabilitation, replacement or acquisition of natural resources and/or services injured or lost. The Trustee MOA also identified NOAA as the Lead Administrative Trustee (LAT) for the spill case. The LAT serves as a logistical, administrative and fiscal agent for the Trustee Council and coordinates Trustee Council activities. NOAA's participation in the development of this Draft RP was limited to administrative activities undertaken as the LAT.

[2] The EEA Secretary is also a designated Trustee under M.G.L. Chapter 21A, Section 2A.

The Trustees have worked collaboratively to assess the natural resource injuries to migratory birds and identify potential restoration alternatives. NOAA as the LAT, and the USFWS as the lead Federal agency for this Draft RP, are the Federal agencies responsible for complying with NEPA. The state Trustee agencies are designated cooperating agencies under NEPA. The USFWS and the state Trustees have prepared this Draft RP for the purpose of evaluating potential restoration projects and identifying preferred restoration alternatives to address injuries to the following bird categories: (1) common loon and (2) other birds.

1.5.2. Responsible Party Involvement

Trustees generally must invite responsible parties to participate in the NRDA process, and may enter into agreements to promote cost-effectiveness and cooperation (CFR 990.14(c)). The Responsible Party formally responded in June 2003, indicating acceptance to participate in a cooperative NRDA with the Trustees. In October 2006, the Responsible Party entered into a cooperative NRDA agreement with the Trustees titled: "Memorandum of Agreement between Bouchard Transportation Co., Inc. and the Natural Resource Trustees Governing Cooperative Natural Resource Damage Assessment and Restoration Planning Activities for the Bouchard B. 120 Oil Spill" (Trustee-Responsible Party MOA), which included a reimbursement agreement supporting the Trustees' role in injury assessment and accompanying studies and restoration project oversight.

The Trustees prepared and provided the Responsible Party with scopes of work for assessment studies, according to the procedures for cooperative studies outlined in the Trustee-Responsible Party MOA. The Responsible Party's consultant, ENTRIX (now named Cardno ENTRIX), participated in NRDA studies, injury determinations, restoration scaling calculations, and restoration planning discussions. In November 2010, the Trustees and Responsible Party negotiated a mutually agreeable settlement for specified categories of natural resource damages, including shoreline and aquatic resources, piping plovers, and lost natural resource uses. In January of 2018, the Trustees and Responsible Party negotiated a second consent decree for the remaining natural resources injured as a result of the Spill, which included common loon, common and roseate terns, and all other affected bird species.

1.5.3. Public Involvement, Notification, and Review

Public review of this Draft RP is an integral and important component of the restoration planning process and is consistent with all applicable State and Federal laws and regulations, including NEPA and its implementing regulations, and the guidance for restoration planning found within the OPA regulations (15 CFR §990.55).

The Trustees have published a notice of the availability of this Draft RP in local newspapers and issued a press release to regional newspapers and other media outlets. The Draft RP is available for public review and comment through October 31, 2019. The electronic version of the Draft RP document is available for public review at the following websites:

USFWS—New England Field Office

NOAA Damage Assessment Remediation and Restoration Program: Bouchard Barge 120

Natural Resource Damages Program Restoration Funds: MassDEP

To receive a hard copy of the Draft RP please contact Ms. Molly Sperduto at molly_sperduto@fws.gov.

The Trustees will hold a public information meeting on September 12, 2019 at 1 pm EST via a live webinar to present the Draft RP. Details about how to access the public meeting will be posted on the USFWS website. The meeting will be held during the public comment period so that interested parties will have an opportunity to ask questions, submit verbal or written comments, and learn more about the Draft RP.

The Trustees will consider all written comments received during the public comment period. After review and consideration of the public comments received, the Trustees will release a Final RP. Written comments received and the Trustees' responses to those comments, whether in the form of restoration plan revisions or written explanatory responses to comments, will be summarized in the Final RP.

1.5.4. Administrative Record

The Trustees have established an Administrative Record in compliance with Federal regulatory requirements for NRDAs (15 CFR §900.45). The Administrative Record includes information and documents prepared by and/or relied upon by the Trustees during the injury assessment and determination, restoration scaling, and restoration planning. Interested persons can access or view the Administrative Record at the following locations:

NOAA Restoration Center
28 Tarzwell Drive
Narragansett, RI 02882
Attention: Bouchard B-120 Administrative Records Management
and
NOAA Damage Assessment Remediation and Restoration Program: Bouchard Barge 120

Arrangements must be made in advance to review or to obtain copies of these records by contacting the office listed above. Access to and copying of these records is subject to all applicable laws and policies including, but not limited to, laws and policies relating to copying fees and the reproduction or use of any copyrighted material.

1.6. Natural Resource Injuries to Migratory Birds

To evaluate potential injury to migratory birds, the Trustees worked cooperatively with the Responsible Party. The Trustees compiled and analyzed carcass collection data and estimated the number of adult birds that died as a result of the Spill (total = 1,174 birds, including 531 common loon, 9 roseate tern, 25 common tern, 83 common eider, 83 red-throated loon, 77 black scoter, 38 dunlin, and 328 individuals of a variety of other species). Potential effects on the production

of fledglings (also known as the F1 generation) were determined by utilizing published life history data (whenever possible) for each species, or in the case of terns, based on site-specific monitoring data collected following the Spill.

The Trustees conducted a Resource Equivalency Analysis (REA) to evaluate the total injury to birds and to calculate appropriate compensation for the calculated injury. Utilizing the REA methodology, the Trustees first calculated the loss of birds (adult and fledges) for each year of their expected life spans (direct injuries). The Trustees also calculated the loss of the first generation of fledges for each year of their expected life spans (indirect injuries) for some of the bird species, depending on species-specific life history data. Then, using basic economic techniques, the sum of the direct and indirect injuries was converted to a current value of the loss, known as discounted bird-years (DBYs). Based on this analysis, the Trustees determined the total direct and indirect loss for all impacted bird species as a result of the Spill (26,454 DBYs).

To evaluate and scale suitable restoration, three categories of injured bird species were developed, as follows:

- common loon (4,013 DBYs)
- common tern (17,904 DBYs), roseate tern (549 DBYs) and shorebirds (604 DBYs)
- all other birds (3,384 DBYs)

The Trustees evaluated various alternatives to restore each of the categories of injured birds to their baseline and generate additional bird-years to compensate for interim losses that occurred until recovery to baseline conditions. Restoration projects were scaled and costs were estimated to determine the total amount of natural resource damages.

The following sections summarize the injury assessment for common loon and other birds. Injuries to common and roseate terns (and shorebirds) will be described in a separate restoration plan that will be released following additional project alternatives analyses. This approach enables the Trustees to expedite restoration for common loon and other birds.

1.6.1. Common Loon Injury Assessment

The Trustees estimated the number of common loon killed by the Spill, either through acute or delayed effects, to be 531 birds. The total number of common loon killed was estimated based on the number of dead and oiled common loon collected throughout Buzzards Bay, following the Spill. In addition, several oiled common loon were collected from New Hampshire and Maine and these were also determined to have been oiled from the Spill (MA-EEA et al. 2005). Had the Spill not occurred, these birds would have lived their natural lifespans, estimated to be 30 years (Evers 2007). This spill-related loss of bird-years associated with this species, in present-value terms, is the first component of the Trustees' total estimate of losses for common loon.

In addition, the Trustees estimated the lost DBYs associated with the first generation of fledglings that would have been produced by the common loon killed by the Spill. To evaluate the lost fledglings, the Trustees considered life history characteristics of the common loon (Table 1). Of note, common loon populations typically include a number of non-breeding adults, or floaters.

Nest sites that become available due to the death or 'divorce' of the breeding adults are generally occupied by floaters (Piper et al. 2000; Evers 2001; Grear et al. 2009). The Trustees assumed that nest sites that would have been otherwise occupied by the killed birds were instead occupied by floater adults. Recruitment attributed to these floaters was expected to replace, in part, the foregone production of the killed birds. An adjustment was made to account for the fact that floater productivity was expected to be lower than the productivity associated with more experienced breeders. The lower productivity associated with floaters was calculated for only one year, after which time the Trustees assumed that the floater productivity would be equal to the pre-spill breeding adult productivity.

Consistent with previous common loon injury calculations (Sperduto et al. 2003), the Trustees used a REA to calculate the total lost DBYs. Table 2 shows the total estimated losses of common loon bird years (4,013 DBYs), and the breakdown by category (direct loss and foregone production of the F1 generation).

To compensate for the injury to common loon, the Trustees identified three established restoration project types based on previous experience and input from common loon experts and scientific literature (NOAA 1999; Evers et al. 2009; DeSorbo et al. 2007; LPC 2011; Hammond 2009). These projects included: (1) creating artificial nest sites; (2) implementing a nest protection program with loon wardens, signage and public outreach; and (3) protecting land around existing nest sites to limit future reductions in productivity. Each project was scaled using the life history data and the total cost to restore the loss (4,013 DBYs) was estimated.

Table 1. Common loon life history parameters used in injury and restoration scaling calculations.

Parameter	Value	Notes	References
Fledgling survival	0.7	Survival from fledgling to 1 y.o.	Mitro et al. 2008
Annual immature survival/Annual adult survival	0.8 0.92	Mitro et al. (2008) estimated immature survival rates: 0.80 for 1-2 y.o. and 2-3 y.o., 0.92 for 3+ y.o. Evers (2007) survival to 3 y.o. = 0.41, which amounts to about 0.74 annually in this age range.	Mitro et al. 2008; Evers 2007
Adult productivity (#fledglings/female)	0.53	Evers 2007: Species-wide average of 0.53+/-0.19 (0.29-0.96 range for northern New England and New York). 0.37 (Mitro et al. 2008) for high-Hg lakes in northern NH and ME.	Evers 2007; Mitro et al. 2008
Age at first breeding (yrs)	6	--	Evers 2007
Percent adult female population that breeds each year	80%	Evers 2007. NH average = 54%. Increased this to 80% to more closely reflect the observed population trend.	Evers 2007
Percent females in population	50%	--	Trustee assumption
Maximum life span (yrs)	30	Evers 2007	Evers 2007
Population status	level to increasing	Christmas Bird Count (CBC) shows insignificant increase in Buzzards Bay (1987-2008). Evers (2007): ME, NY, level. NH, VT, MA increasing. Ontario, Quebec decreasing.	CBC multiple years; Evers 2007
Affected population size	2,100	Territorial pairs in New England	Evers and Taylor 2014
Total number dead	531.2	Includes ~20 birds estimated to have died through delayed mortality, with the remainder having died immediately in the wake of the spill.	Trustee assumption
Floater productivity	0.371	30% lower than that of more experienced adults.	Note
Floater productivity duration (yrs)	1	--	Trustee assumption

Note: Data sources considered include Weimerskirch (1992), Lee et al. (2008), Wooller et al. (1990), and Cooke et al. (1981). These authors found first-year breeders to have lower productivity than more experienced breeders, with effects on productivity ranging from 10 percent to 40 percent lower.

Table 2. Trustee calculated common loon losses (2003 DBYs).

Injury	Common Loons
Number of birds killed*	531.2
Direct and indirect mortality (DBYs)	3,899
F1 losses (DBYs)	114
Total losses (DBYs)	**4,013**

* The Trustee estimate of killed birds is a calculated value (rather than a whole number) resulting from a modelling approach that considers the number of dead birds collected, searcher efficiency rates, scavenging rates, and a number of other factors.

1.6.2. Other Birds Injury Assessment

The Trustees calculated losses to the Other Bird species group (i.e., non-tern, non-shorebird, non-common loon) injured as a consequence of the Spill. These include rocky island colonial nesting species (double-crested cormorant, great cormorant, herring gull, great black-backed gull, and ring-billed gull), pelagic seabirds (northern gannet, razorbill, sooty shearwater), red-throated loon and grebes (horned grebe, red-necked grebe), diving ducks (common eider, black scoter, white-winged scoter, surf scoter, red-breasted merganser, hooded merganser, greater scaup, bufflehead, and long-tailed duck), and other waterfowl (American black duck, Canada goose) (Table 3).

The Trustees' loss calculations are measured in units of DBYs and include two components. The first of these consists of DBYs associated with birds killed by acute or delayed effects of the Spill. For example, the Trustees have estimated that 83.2 common eider were killed by the oiling. Had the Spill not occurred, these birds would have lived out their natural lifespans, generating ecological services quantified as 459 DBYs. For ease of reference, Table 4 summarizes eider key life history parameters used in this calculation.

In addition, foregone productivity was calculated for some of the killed birds (e.g., diving ducks), depending on life history characteristics. For example, for bird species that do not have floaters that could fill the void of lost adults or for species where recovery was considered to be slower due to relatively late age of first breeding and lower reproductive success, foregone productivity associated with the first generation was calculated. Losses associated with this foregone F1

generation were calculated in the REA as the present value of these fledglings (in DBYs), considered over the course of the fledglings' natural lifespans.

A total of 3,384 DBYs, or approximately 13 percent of the total DBYs, were estimated lost due to the death of other birds. In the judgment of the Trustees, development of separate, relatively small restoration projects for each of the impacted bird species would not be practical, beneficial or cost-effective. Therefore, as has been done in other cases (NOAA et al. 1999; CDFG et al. 2007; CDFG et al. 2012), the Trustees selected a single "umbrella" species approach to restore all of the other birds. Since more than 50 percent of the other birds lost were diving ducks, with common eider experiencing the highest rate of mortality, the Trustees focused restoration efforts on increasing common eider productivity and survival by protecting habitat that is utilized for both breeding and overwintering. The Trustees scaled the size of habitat needed to be protected based on life history data for common eider and estimated costs for land protection. Habitat protection for the common eider is expected to benefit many of the bird species that were impacted by the Spill.

1.7. Summary of Settlement for Natural Resource Damages

Under the OPA rules, the Responsible Party is liable for the costs of conducting a natural resource damage assessment, as well as the costs of implementing restoration projects to restore the injured resources. Throughout the assessment phase, the Responsible Party reimbursed the Trustees for assessment costs. In January 2018, based on the injury assessment and restoration scaling efforts, the Trustees and Responsible Party reached a mutually agreeable settlement to restore injuries to common and roseate terns, common loon, and other birds resulting from the Spill. Under the agreement, the Responsible Party agreed to pay damages totaling $13,300,000.00. This settlement includes the costs of Trustee restoration planning, implementation, oversight, and monitoring. The settlement was memorialized in a consent decree on January 24, 2018 (United States of America v. Bouchard Transportation Company, Inc., Tug Evening Tide Corporation, and B. No. 120 Corporation, January 24, 2018, U.S. District Court, District of Massachusetts):

U.S. Department of the Interior Natural Resource Damage Assessment and Restoration Program: T/B Bouchard B-120 Grounding Fuel Oil Spill

Table 3. Trustee estimate of rocky island colonial bird, pelagic seabird, red-throated loon, grebe, diving duck, and waterfowl losses (2003 DBYs).

Common Name	Scientific Name	Trustee estimate of killed birds*	Carcass DBYs	F1 DBYs	Total DBYs**
ROCKY ISLAND COLONIALS					
Double-crested Cormorant	*Phalacrocorax auritus*	30	151	0	151
Great Cormorant	*Phalacrocorax carbo*	7.5	29	0	29
Herring Gull	*Larus argentatus*	50	248	0	248
Great Black-backed Gull	*Larus marinus*	24.4	96	0	96
Ring-billed Gull	*Larus delawarensis*	9.5	56	0	56
Total Rocky Island Colonials		121.4	580	0	580
PELAGIC SEABIRDS					
Northern Gannet	*Morus bassanus*	8.1	67	2	69
Razorbill	*Alca torda*	11.2	82	116	198
Sooty Shearwater	*Ardenna grisea*	2.4	20	0	20
Total Pelagic Seabirds		21.7	169	118	287
RED-THROATED LOONS AND GREBES					
Red-throated Loon	*Gavia stellata*	82.7	573	0	573
Horned Grebe	*Podiceps auritus*	6.3	11	0	11
Red-necked Grebe	*Podiceps grisegena*	22.4	60	0	60
Total Red-Throated Loons and Grebes		111.4	644	0	644
DIVING DUCKS					
Common Eider	*Somateria mollissima*	83.2	459	21	480
Black Scoter	*Melanitta americana*	76.6	289	336	626
White-winged Scoter	*Melanitta deglandi*	11.9	44	44	88
Surf Scoter	*Melanitta perspicillata*	21.4	79	80	159
Red-breasted Merganser	*Mergus serrator*	26.2	71	10	81
Hooded Merganser	*Lophodytes cucullatus*	2.4	6	0	6
Greater Scaup	*Aythya marila*	2.4	8	7	15
Bufflehead	*Bucephala albeola*	21.9	50	71	121
Long-tailed Duck	*Clangula hyemalis*	28.6	130	125	255
Total Diving Ducks		274.6	1136	694	1831
OTHER WATERFOWL					
American Black Duck	*Anas rubripes*	4.8	10	0	10
Canada Goose	*Branta canadensis*	11.4	32	0	32
Other Total Waterfowl		16.2	42	0	42
GRAND TOTAL		545.3	2571	812	3384

* The Trustee estimate of killed birds is a calculated value (rather than a whole number) resulting from a modelling approach that considers the number of dead birds collected, searcher efficiency rates, scavenging rates, and a number of other factors.

** Totals may not exactly match due to rounding.

Table 4. Common eider life history parameters used in injury and restoration scaling calculations.

Parameter	Value	Notes	References
Fledgling survival (survival from fledging to 1 y.o.)	0.88	Used adult survival rate from Birds of North America (BNA).	Goudie et al. 2000
Annual adult survival	0.88	BNA: 0.87-0.88	Goudie et al. 2000
Adult productivity (#fledglings/female)	0.42	0.3 from Milne and Reed 1974. Flag Island, ME: 0.354 ducklings/hen in 2006; 0.278 - 0.93 ducklings/hen in 2007 (Allen et al. 2008) 0.12 ducklings per pair (Mawhinney et al. (1999)). Using all data, avg. =040. Used 0. 42 so that r is closer to zero.	Milne and Reed 1974; Mawhinney et al. 1999; Allen et al. 2008
Age at first breeding	3	--	Goudie et al. 2000
Adult female population that breeds each year (%)	0.78	--	Goudie et al. 2000
Percent females in population	50%	--	Goudie et al. 2000
Maximum life span (yrs)	21	--	Goudie et al. 2000
Total number dead	83.2	Trustees' Acute Mortality Report + delayed mortality	Trustees' Acute Mortality Report

Funds were designated to achieve restoration goals for the following categories:

- Loon Restoration: The Trustees will use approximately $7.3 million of the funds to plan, implement, oversee, and monitor the restoration of common loon.

- Tern Restoration: The Trustees will use approximately $5 million of the funds to plan, implement, oversee, and monitor the restoration of common and roseate terns.

- Other Birds: The Trustees will use approximately $1 million of the funds to plan, implement, oversee, and monitor the restoration of other bird species impacted by the Spill.

Trustees allocated specific funding amounts to each state, based on the level of injury to each category of birds in each state. The subdivision of the $13.3 million for use by the Trustees to restore, replace, or acquire the equivalent of birds injured by the Spill is as follows:

- Restoration in Rhode Island (Common Loon and Other Birds), the amount of $1,274,000 ($1,300,000, less 2 percent of the funds for restoration planning and oversight); the Trustees note that approximately 10 percent of the dead birds recovered following the Spill were found in Rhode Island;

- Restoration in Massachusetts (Common Loon), the amount of $6,370,000 ($6,500,000 less 2 percent of the funds for restoration planning and oversight);

- Restoration in Massachusetts (Other Birds), the amount of $490,000 ($500,000, less 2 percent of the funds for restoration planning and oversight);

- Restoration in Massachusetts (Common and Roseate Terns), the amount of $4,900,000 ($5,000,000 less 2 percent of the funds for restoration planning and oversight) will be combined with funds from the Ram Island Shoreline and Related Resources Settlement ($534,000 that was previously secured through the first Consent Decree and has since gained interest). As mentioned above, injuries to common and roseate terns (and shorebirds) will be described in a separate Restoration Plan that will be released by the Trustees at a later date; and

- Restoration Planning and Oversight of Bird Restoration, the amount of $266,000, or 2 percent of the overall settlement, plus any anticipated interest earned following the date of initial deposit ($34,046.76 in interest gained as of May 28, 2018).

2. Restoration Planning

The goal of natural resource restoration planning through the OPA regulations is to identify actions appropriate to restore, rehabilitate, replace, or acquire natural resources or services equivalent to those injured by oil spills, to the condition that resources would have been if the incident had not occurred. Trustees are required to identify and consider a reasonable range of alternatives that would address the injuries associated with the spill, as well as consider a No Action alternative for comparison and contrast with proposed actions.

2.1. Public Involvement in Restoration Planning

Following the Spill, the Trustee Council met with citizens, environmental groups, and local and regional officials to inform the public about the status of the spill response, future agency actions, and the general NRDA process. Beginning in 2003, multiple public meetings were hosted by elected officials (former U.S. Senator John F. Kerry, former U.S. Congressman Barney Frank, and Massachusetts State Senator Mark Montigny), local environmental organizations (e.g., Buzzards Bay Coalition [BBC]), and the MassDEP. The public meetings provided an opportunity to explain to local residents and other interested citizens that thorough documentation and assessment of the impacts from the Spill were an integral part of the process leading to restoration planning and restoring the natural resources harmed by the Spill, as well as restoring the public's use of these natural resources. Additionally, the Trustees released fact sheets to the public in 2006, 2008, 2011 and 2012 to explain and update the status of the case injury assessment and restoration planning effort.

Throughout the injury assessment and restoration planning phases, the Trustees consulted with Federal and State wildlife agency experts, as well as organizations and individuals familiar with common loon and other injured bird species (e.g., LPC, BioDiversity Research Institute, Maine Audubon, Vermont Center for Ecostudies: Vermont Loon Conservation Project, Massachusetts

Audubon). These experts and organizations provided input on life history data, restoration opportunities, costs, and restoration project feasibility. Of note, the Northeast Loon Study Working Group (NELSWG), which is comprised of non-profit, private and government organizations that conduct loon monitoring, research, management and outreach programs throughout the northeastern United States and Canadian provinces, provided *A Proposal to Restore Common Loon Losses Resulting from the Bouchard Barge 120 Oil Spill* (Evers et al. 2009). In preparing this Draft RP, the Trustees relied heavily on this document and assistance from the NELSWG member organizations.

This Draft RP is provided to the public to both fully explain the injury assessment process and gain input from the public on the proposed restoration alternatives. Public input will be fully considered when the Final RP is prepared. The Final RP will describe the public input and the basis for recommendations of the preferred alternatives.

2.2. Restoration Criteria

The purpose of restoration, as outlined in this Draft RP, is to make the public whole for injuries to common loon and other birds resulting from the Spill, and to compensate for the associated interim natural resource losses. The OPA and the NRDA regulations provide that recovered damages be used to restore, rehabilitate, replace, or acquire the equivalent of the resources and services that were injured or lost, although these regulations provide trustees with the flexibility to identify and implement projects that best address resource injuries and their lost uses. Natural resource trustees must consider a reasonable range of alternatives and are provided discretion in identifying and selecting restoration projects.

The OPA regulations (15 CFR §990.54) require Federal and state trustees to evaluate proposed restoration alternatives based on a minimum of the following factors:

- the cost to carry out the alternative;
- the extent to which each alternative is expected to meet the Trustees' goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses;
- the likelihood of success of each alternative;
- the extent to which each alternative will prevent future injury as a result of the incident, and avoid collateral injury as a result of implementing the alternative;
- the extent to which each alternative benefits more than one natural resource and/or service; and
- the effect of each alternative on public health and safety.

Prior to fully evaluating proposed restoration alternatives, the Trustees identified a set of Eligibility Criteria to determine whether potential projects met minimum standards for

applicability (Refer to Section 2.2.1. below). Potential projects that met the Eligibility Criteria were then evaluated by the Trustees by applying the Evaluation Criteria (Refer to Section 2.2.2.) as the means for assessing and evaluating project strengths and weaknesses, and determining whether a potential project should be considered as a preferred versus non-preferred project to address the natural resource injuries.

2.2.1. Eligibility Criteria

Potential restoration projects must meet the following Eligibility Criteria to be considered and evaluated by the Trustees:

- demonstrates a significant resource or spatial nexus to the restoration, rehabilitation, replacement, and/or acquisition of the equivalent of the injured natural resources;

- in terms of cost, does not overburden the ability of the Trustees to expend funds in a manner that accomplishes Trustee restoration goals for the injury restoration, and/or allows the Trustees to select project(s) that serve as broad a geographic area affected by the Spill as possible, and benefits the restoration of the injured natural resources;

- provides measurable results. A project must deliver tangible and specific natural resource restoration results that are identifiable and measurable, and will be capable of being assessed and evaluated using quantitative methods, so that changes to the targeted resource and/or resource use can be documented and evaluated;

- ensures protection of human health and safety, and/or is not prohibited by Federal, state, or local laws, regulations, or policies addressing public health and safety;

- is not subject to an independent, prior obligation to perform the action or activity pursuant to statute, regulation, ordinance, consent decree, judgment, court order, permit condition, memorandum of agreement, or contract. The project must not otherwise be required by Federal, state, or local law, including but not limited to enforcement actions or regulatory compensatory mitigation requirements; and

- is consistent with, or will not be negatively impacted by, any future remediation activities, nor would the project adversely affect any ongoing or anticipated remedial actions in the resource injury area.

2.2.2. Restoration Evaluation Criteria

Based on the six evaluation criteria in the OPA regulations and other factors important to meet the Trustees' restoration goals, the Trustees developed the following nine Evaluation Criteria to assess project strengths and weaknesses (Table 5).

Table 5. Restoration evaluation criteria.

High Importance	•Nexus to Injury - Spatial proximity within affected area •Nexus to Injury - Same or similar species
Medium Importance	•Project implementation readiness •Technical feasibility/likelihood of success of project •Sustainability of resource benefits •Cost/cost effectiveness
Low Importance	•Impact avoidance or minimization •Level of funding and resources needed for project implementation •Community involvement

Representatives from the Trustee agencies evaluated each eligible restoration alternative through a qualitative assessment of the Evaluation Criteria. While USFWS reviewed all eligible restoration projects, MassDEP reviewed all eligible projects except those proposed to be implemented in Rhode Island. RIDEM only reviewed projects proposed to be implemented in Rhode Island.

3. Restoration Alternatives

The Trustees considered a range of potential restoration alternatives for this Draft RP. Several alternatives are considered for each category of birds impacted by the Spill: common loon and other birds. A suite of proposed restoration projects is identified to collectively compensate for the injuries to the injured bird categories.

The Trustees also evaluated a No Action alternative, as discussed in the following section.

3.1. No Action Alternative

With the No Action alternative, no restoration, rehabilitation, replacement or acquisition projects or actions would occur and no case settlement funds would be expended. While other Federal and State (e.g., Massachusetts Division of Ecological Restoration) restoration programs exist in the Buzzards Bay region, no programs are targeted specifically at addressing the injuries to birds that resulted from the Spill. A lack of directed funding for targeted bird restoration projects would prolong the loss to bird populations from the Spill. With this alternative, only natural recovery of the injured bird populations would occur. For purposes of this Draft RP, the No Action Alternative cannot be the preferred alternative since compensatory restoration (for the interim loss of natural resources and services pending recovery) is required by Federal statute (i.e., OPA) and regulations. The No Action alternative is retained in this Draft RP for comparative purposes.

3.2. Common Loon Restoration Alternatives

The remainder of the following section consists of descriptions and an evaluation of each of the preferred and non-preferred project alternatives for restoring common loon.

3.2.1. Common Loon Restoration – Preferred Alternatives

As described in Section 1.6.1., Trustee analysis indicates that approximately 531 common loon were killed by the Spill, resulting in a total loss of 4,013 DBYs (including direct mortality and associated losses of future fledglings).

Common loon restoration is of particular importance to the Trustees because of scientific concern about the status of common loon populations in the northeastern United States and strong public interest in and support for this species. In recognition of these issues, the State of New Hampshire has listed common loon as a threatened species, and in Massachusetts, Connecticut and New York, they are listed as a species of special concern. Common loon are also a species of management concern for the USFWS.

Public and scientific concerns about the stability of common loon populations in the Northeast reflect the large number of specific threats to breeding and wintering populations of loons. Many of these threats adversely affect common loon during the breeding season (e.g., shoreline development, mercury bioaccumulation, lead poisoning from fishing tackle, disturbances by recreational boaters, and variability in lake water levels due to hydropower operations) and thus result in reduced reproductive success.

Because the focus of common loon restoration is to increase production of loons to offset the loss, priority is given to restoration projects that enhance productivity of the species during (but not limited to) the nesting season. Relatedly, the Trustees have determined that this restoration must occur in New England, including the states directly impacted by the oil and northern New England, because data from band recoveries, satellite telemetry, and morphometric information indicate that common loon that winter in Buzzards Bay breed in Maine, New Hampshire, Vermont and Massachusetts (Evers 2007; Savoy and Evers 2019). Also, since several oiled common loon were found in New Hampshire and Maine following the Spill, the Trustees are targeting some restoration efforts in northern New England to help compensate for the loss in those states.

A total of $7.3 million is available to implement, oversee and monitor the restoration of common loon. As described in Section 1.7., approximately 10 percent of the loon settlement funds have been allocated specifically for restoration in Rhode Island. Funds targeted for restoration in Rhode Island will be discussed in Section 3.3.1. The remaining $6,370,000 will be directed to projects in Massachusetts and northern New England.

The Trustees propose two preferred loon restoration alternatives. The first is a translocation and captive rearing project designed to restore common loon to historic breeding habitat in Massachusetts. The second alternative is a suite of restoration actions that can be implemented throughout New England and are designed to increase productivity of nesting common loon. Funds are proposed to be evenly divided between the two restoration alternatives, with up to $3,185,000 allocated to each.

3.2.1.1. Common Loon Restoration through Translocation and Captive Rearing (COLO-1)

3.2.1.1.1. Restoration Objective

The goal of this alternative is to use translocation and captive rearing techniques to restore common loon to their former breeding range in Massachusetts and to strengthen existing populations within the State. Translocation is accomplished by moving individual loon chicks from existing breeding lakes to potential breeding lakes. It is based on the knowledge that common loon chicks will imprint on the lakes where they are born and raised and subsequently return to these lakes to breed.

Historically, common loon bred throughout Massachusetts and southward into southern New York, New Jersey and Pennsylvania. Due to a variety of factors, including pollution, loss of habitat, sport shooting, and lack of regulatory protection, the common loon population substantially declined and loons were officially declared extirpated from Massachusetts in 1925 (Evers et al. 2018). Common loon recolonized the State as a breeding bird in 1975 when a pair was documented nesting on Quabbin Reservoir, which was built in the 1930s and is the largest inland body of water in Massachusetts. Since 1975, the common loon population has steadily increased in Massachusetts and there are currently 45 territorial pairs that have repopulated water bodies in the central portion of the State, including Quabbin and Wachusett Reservoirs (Savoy and Evers 2019). However, common loon have relatively short natal dispersal distances (average = 8 miles or 13 km; Evers et al. 2010) and low annual productivity (average productivity in Massachusetts is 0.48 chicks/pair; Evers et al. 2018) making them slow to disperse and recolonize new areas. For these reasons, the common loon population increase and range expansion in Massachusetts since their recolonization in 1975 has been modest, and the proposed translocation efforts could greatly boost the breeding population and range of loons in the state.

For this loon translocation project, a total of 63 to 84 common loon chicks are proposed for release at historic breeding sites in southeastern and western Massachusetts; as a result, 70 breeding loon territories are expected after 30 years. The Massachusetts translocation project presents a unique opportunity in the Northeast to establish a robust population of nesting common loon in areas with extensive habitat that currently have no or very few nesting pairs.

3.2.1.1.2. Summary of Proposed Activity

This project uses recently established translocation and captive rearing techniques for common loon to reintroduce the species to their former breeding range in Massachusetts. Similar translocation and captive rearing projects have been utilized to restore numerous species of birds globally. In New England, translocation efforts have successfully been conducted for bald eagle, peregrine falcon, and common eider. The most similar to the common loon translocation project was when in the early 1970s common eider hens and eggs were collected from Maine and moved to southeastern Massachusetts where they were hatched in captivity and later released on Penikese Island in Buzzards Bay. Eider began nesting on Penikese Island in 1976 and since that time have increased to over 850 pairs extending from Cape Ann through Buzzards Bay (Heusmann and Trocki in review). Based on observations of eider in Boston Harbor that were banded at Penikese Island, and the distribution of eider in Massachusetts, Heusmann and Trocki (in review)

believe that the expansion of eider along the Massachusetts coast is due to the initial translocation and subsequent expansion from Penikese Island.

The Trustees are proposing to work with Biodiversity Research Institute (BRI) to implement the project, as they have led recent translocation efforts in Massachusetts, Minnesota and Wyoming, and they have in-depth knowledge and relevant experience in the techniques required for translocation. In collaboration with the New York State Department of Environmental Conservation, Maine Department of Inland Fisheries and Wildlife, and the Massachusetts Division of Fisheries and Wildlife, BRI began translocation efforts in southeastern Massachusetts in 2015. To date, 24 common loon chicks have been successfully moved from New York and Maine to southeastern Massachusetts. Initial results indicate that translocated common loon chicks have successfully imprinted on lakes in southeastern Massachusetts. In 2017, an immature common loon translocated as a chick the previous year was resighted. In 2018, four of the previously released chicks returned as 2- or 3-year-olds, two of which paired and established a territory (Evers et al. 2018).

This project would continue translocation efforts that began in southeastern Massachusetts at the Assawompset Pond Complex (APC), the largest natural inland waterbody in the State, and expand the effort to include a second site in Berkshire County in the vicinity of October Mountain Reservoir (Figure 3). These two sites are proposed because they both have numerous lakes which provide suitable breeding habitat and because they formerly had breeding common loon. Due to the effort and expense associated with translocation, the project targets two release areas that are estimated to have the greatest amount of potential breeding habitat in Massachusetts (Spagnuolo 2012). From these two areas, we expect that common loon will expand outward and subsequently colonize other available habitat in Massachusetts.

Under the proposed project, the APC would serve as the first rearing facility and release site. The APC is located on the Plymouth/Bristol County line and is composed of Assawompset, Pocksha, Great Quittacas, Little Quittacas and Long Ponds. All of the ponds are public water supply reservoirs, and with the exception of Long Pond, they are largely protected from development through conservation restrictions. Recreational use is limited to trails on the property surrounding the lakes. Boating (including the use of canoes and kayaks) is prohibited, except to historic landowners. Swimming is prohibited and shoreline fishing is restricted to certain areas. The protected nature of the ponds and limited amount of recreational use and boating makes them an ideal restoration site. In addition, it is an optimal location for rearing and releasing chicks, due to the number of large, natural lakes in the area and abundant prey fish species.

October Mountain Reservoir, located in Berkshire County in western Massachusetts, will serve as the second location for the rearing and release of common loon chicks. This lake was chosen because it is part of a larger complex of nearby lakes that have suitable nesting and rearing habitat for breeding common loon pairs. October Mountain Reservoir is surrounded by the 16,000+-acre October Mountain State Forest, the largest state forest in Massachusetts.

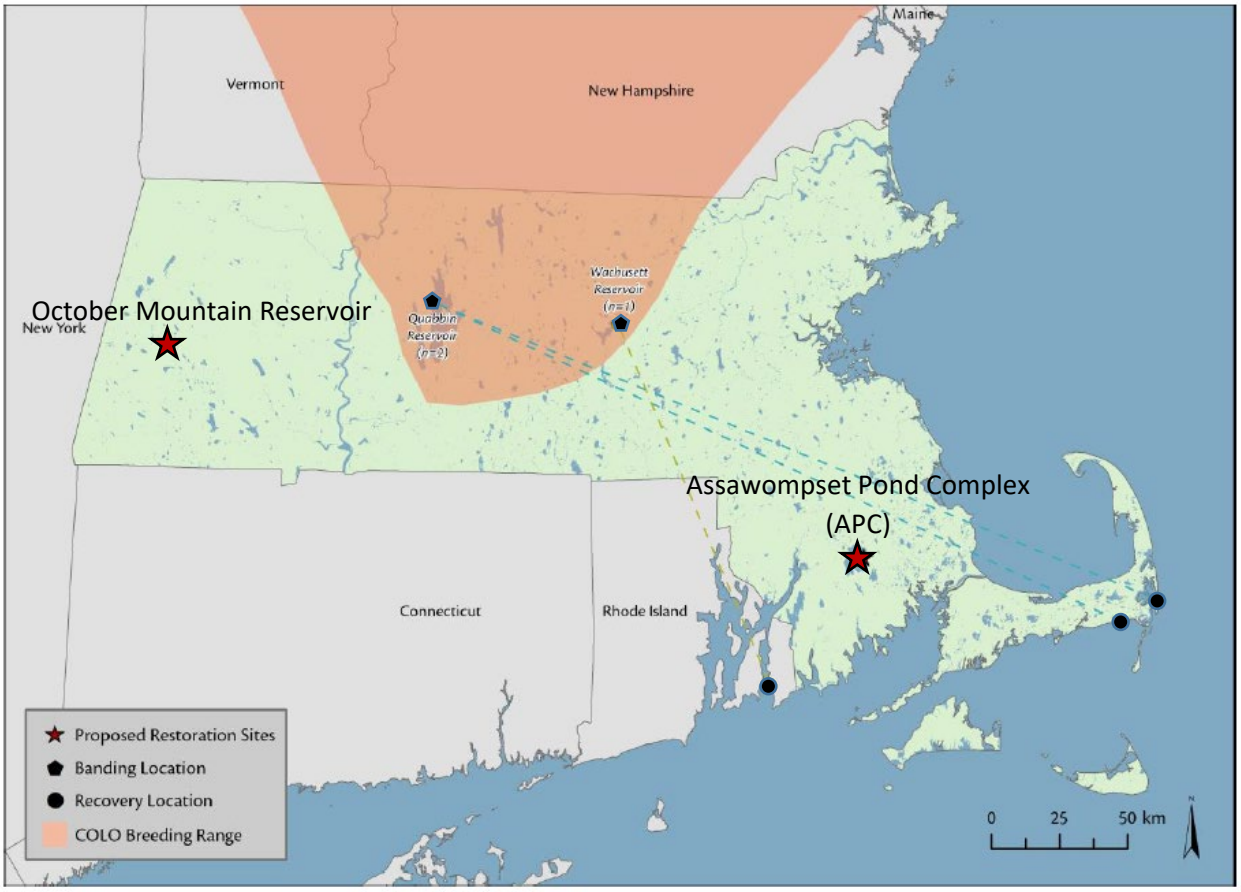

Figure 3. Breeding range of the common loon in Massachusetts, common loon banding and winter recovery locations with dashed lines showing migration routes, and the proposed restoration sites in southeastern and western Massachusetts.

The translocation and captive rearing effort will follow protocols outlined by Kneeland et al. (in review). Chicks will be selected for translocation from common loon pairs on lakes in Maine and New York that are identified in collaboration with the Maine Department of Inland Fisheries and Wildlife and the New York State Department of Environmental Conservation based on long-term loon monitoring efforts. Chicks at least 5 weeks of age will be selected from loon pairs with existing two-chick families. Chicks will be translocated to Massachusetts under the care of an attending veterinarian. Rearing pens will be set up at Pocksha Lake for the APC site and October Mountain Reservoir for the Berkshire County site. Chicks will be reared in these specially designed aquatic caged pens until they are old enough to feed on their own (9-10 weeks). Prey fish will be purchased and introduced within the rearing areas, so that food is not limited and because common loon chicks are usually too young to forage on their own. BRI will monitor and feed the loon chicks without being seen to ensure that the young birds do not become used to humans during the rearing process. All chicks will be color-banded prior to release to provide a method for remote identification.

During the chick collection effort, chicks that are 8 weeks of age or older will be collected and translocated to Massachusetts where they will be directly released at project locations. These older chicks are typically more challenging to capture, but they provide an additional translocation opportunity that avoids the captive rearing stage and allows researchers to directly release young birds in Massachusetts lakes. Both techniques will be utilized.

In total, 27 to 36 Maine-hatched common loon chicks would be released at the APC site and 36-48 New York-hatched chicks would be released at the October Mountain site. Based on habitat availability, productivity and survival estimates, as well as other life history data, a projected 20 breeding common loon territories will be established in the APC site within 20 years. After 30 years, another 14 breeding territories are expected, for a total of 34 breeding territories within a larger area throughout much of southeastern Massachusetts. At the October Mountain site, 12 breeding common loon territories are expected in the area after 20 years, and a total of 36 breeding territories are expected after 30 years. A total of 70 breeding common loon territories are expected to be created at both areas after 30 years. Analyses of habitat characteristics and loon population data indicate that enough suitable habitat exists to support about 55 pairs in southeastern Massachusetts, 35 pairs in Berkshire County and 295 pairs statewide (Spagnuolo 2012; Spagnuolo 2014).

Additional information about the translocation and captive rearing process can be found here:

Loon Translocation: A Summary of Methods and Strategies for the Translocation of Common Loons (BRI 2018)

In conjunction with the translocation efforts, additional management techniques may be utilized to enhance productivity of newly established common loon pairs. Artificial nests, or floating rafts, may be placed at proposed project sites. Biologists have successfully used rafts as a management tool on a number of lakes in northern New England (DeSorbo et al. 2007; LPC 2011). Although rafts can be a very useful tool to promote common loon conservation on waterbodies with fluctuating water levels, study sites will be carefully evaluated before deploying rafts. If there are high quality natural nesting locations within actual or proposed loon territories, rafts may not be used in order to encourage birds to use natural nesting locations. However, if good natural nest sites do not exist or productivity is poor, rafts may be used to facilitate successful nesting.

The total estimated project cost for 6 years of translocation and follow up monitoring is $3,000,000, including staff time, travel, equipment and supplies (Table 6). Salary accounts for the bulk of the project cost (more than 2/3rds) due to the effort required to identify and capture chicks, intensive labor associated with chick-rearing, and post-release monitoring. A principal project coordinator will work with stakeholders and interested parties to communicate about the project. The project coordinator will assist with the preparation and delivery of communications materials, including reports and fact sheets. The project coordinator will also evaluate the yearly project operations and results and assess the project's success and/or need for additional or adaptive management efforts. A field operations manager will oversee the chick collection and rearing efforts for both locations and supervise three field assistants who will monitor and care

for the chicks at each of the rearing facilities. Additional field assistants will monitor returning chicks that were previously released.

3.2.1.1.3. Monitoring and Measurable Results

Monitoring will entail tracking the 24 common loon chicks previously released at the APC site, and thereafter, all other loon chicks released (up to 36 at APC and 48 at October Mountain Reservoir) and potentially returning to the sites in subsequent years for a total of 6 years. Once the juveniles fledge, they will spend up to 3 years on or near the ocean, likely in wintering grounds off the southern coast of New England. BRI will document return rates, dispersal, and breeding status of translocated chicks in southeastern and western Massachusetts, and continue to monitor banded breeding common loon in Massachusetts to determine productivity and other demographic parameters required to assess the success of the project.

3.2.1.1.4. Evaluation of the Alternative

High Importance: *Nexus – Spatial Proximity within Affected Area, Same or Similar Species*: Common loon within the coastal waters and shorelines of Massachusetts and Rhode Island were injured by the Spill. This restoration alternative directly compensates for those injuries to common loon and to the public of Massachusetts by restoring common loon in Massachusetts, where they were impacted. The proposed translocation site in southeastern Massachusetts is approximately 10 miles (16 km) from Buzzards Bay, allowing for loon restoration in close proximity to the spill location.

By restoring common loon nesting pairs to locations where they do not currently exist in Massachusetts, this project directly creates common loon, and has the potential to increase the overall common loon population size and distribution in New England. Once established, each new nesting common loon pair is expected to generate approximately 31.3 DBYs over a period of 30 years. After 100 years, each pair would be expected to generate 50.4 DBYs. Successful translocation efforts are projected to restore 70 breeding pairs, and these pairs would be expected to generate 2,190 DBYs (or 55 percent of the injury) in 30 years and 3,531 DBYs (or 88 percent of the injury) in 100 years.

Medium Importance: *Project Implementation Readiness, Technical Feasibility/Likelihood of Success of Project; Sustainability of Resource Benefits, and Cost/Cost Effectiveness*:
Preliminary common loon translocation has already begun in southeastern Massachusetts; however, additional funds are needed to continue this effort and fully restore common loon to its historic breeding habitat in the State. Project techniques have been established, materials and supplies have been tested, and permits have been obtained. Staff are poised to implement this restoration alternative if funding is available.

Table 6. Overall proposed budget for each of 6 years, following the fiscal year (May 1 to April 30).

CATEGORY	Budget Period 1 (2020-21)	Budget Period 2 (2021-22)	Budget Period 3 (2022-23)	Budget Period 4 (2023-24)	Budget Period 5 (2024-25)	Budget Period 6 (2025-26)	Total Costs
a. Personnel							
Assawompset Pond Complex	$208,400	$174,800	$174,800	$74,500	$74,500	$54,500	$761,500
Berkshires	$40,000	$174,800	$174,800	$174,800	$174,800	$54,500	$793,700
Coordination, Communication, and Data Management	$147,400	$149,800	$147,400	$147,400	$147,400	$98,200	$837,600
Personnel Totals	$395,800	$499,400	$497,000	$396,700	$396,700	$207,200	$2,392,800
b. Travel							
Assawompset Pond Complex	$35,250	$35,250	$32,100	$29,750	$19,150	$29,750	$181,250
Berkshires	$20,650	$48,950	$48,950	$35,250	$32,100	.	$185,900
Travel Totals	$55,900	$84,200	$81,050	$65,000	$51,250	$29,750	$367,150
c. Equipment	$27,000	$26,000	$6,000	$4,000	$4,000	$4,000	$71,000
d. Supplies	$25,550	$44,500	$23,000	$23,000	$23,000	$30,000	$169,050
Total Project Costs	$504,250	$654,100	$607,050	$488,700	$474,950	$270,950	$3,000,000

While translocation has only recently been attempted in common loon, it is an accepted conservation practice for other bird species such as bald eagle, osprey, common eider, canvasback, and Atlantic puffin (MA-EEA et al. 2016; Martell et al. 2002; Stanton 1989; Doty 1983; Gummer 2003). Although these species differ from the common loon in life history and breeding traits, studies support the use of translocation as a method to establish, reestablish, and augment bird populations (Griffith et al. 1989). Furthermore, preliminary results of the common loon translocation at APC are encouraging. In 2017, one captive-reared chick returned to the APC and in 2018, four captive-reared chicks returned, two 2-year-olds and two 3-year-olds. Of these, one territorial pair was documented during the 2018 season (Savoy and Evers 2019). At a translocation site in Minnesota, volunteers reported that one immature translocated loon returned in 2015.

Once loon breeding pairs are established, the project is expected to be naturally self-sustaining. In southeastern Massachusetts, there are at least nine lakes that are suitable for breeding loons, and historically this was an important breeding area. These lakes and ponds provide high quality habitat with clear, clean water, abundant prey fish species, and shoreline habitat with coves and islands that provide for multiple nesting territories. The second translocation site in western Massachusetts is also expected to be self-sustaining. It is located in an area with a number of lakes and ponds that are suitable for nesting. It is also relatively near established breeding loons in the Adirondack Mountains to the west, Vermont to the north, and Quabbin Reservoir to the east.

The translocation effort focuses on restoring loons to former breeding locations in Massachusetts, located at the southern extent of the common loon's current breeding range. Potential risks that may be associated with a changing climate (temperature, severe weather events) could adversely affect the potential success and sustainability of the project. LPC (LPC 2018) has suggested increased precipitation and temperature during the breeding season as significant predictors of reduced common loon hatching success in New Hampshire over the past 40 years. However, the impacts that climate change will have on loons remain uncertain.

Studies suggest species that inhabit the southern margins of their range are critically important to long-term population viability, and managing this portion of the population should be a high priority for resource managers (Hampe and Petit 2005; Rehm et al. 2015). Translocated common loon that can tolerate warmer regions could exhibit adaptation that may be necessary for the species' fitness and persistence under future climates (Petit et al. 2003; Hewitt 2004). As an example, the common eider translocation to Massachusetts in the 1970s has expanded the species' southern range and currently more than 850 eider nest along the Massachusetts coast (Heusmann and Trocki, in review). These birds may be utilizing shellfish food sources that are less abundant in northern climates. The Trustees believe that translocation efforts to restore common loon to their former breeding range in Massachusetts may help the species be more resilient in the future.

Based on a total project cost of $3,000,000, and an estimated gain of 70 breeding pairs, the cost per pair is estimated to be $42,857 ($3,000,000/70 pairs). For an estimated 100-year project life

span, this equates to $850/DBY. Although the total project cost is high, there is great potential to create many DBYs, and the overall cost/DBY is relatively low compared with other alternatives (Section 3.2.1.2.4.).

Low Importance: *Impact Avoidance or Minimization, Level of funding needed, Community Involvement*:
No significant adverse impacts are expected from this project. Loss of juvenile loons during translocation is possible; however, during the previous 3-year effort, there were no losses of chicks associated with the project during translocation or captive rearing. One bird died several days after release when it flew into power lines. No other adverse impacts have been documented.

This project is labor intensive and requires a significant level of effort to be effective; however, it has the potential to directly generate significant numbers of common loon in western and southeastern Massachusetts. The Trustees propose to provide approximately half of the loon restoration funds (up to $3,185,000) to this project.

Some local community involvement is anticipated; volunteers may assist with monitoring activities. BRI will also create and distribute a series of communication brochures or other materials on common loon to help inform and engage the local citizenry in the project.

3.2.1.2. *Common Loon Restoration through Artificial Nest Sites, Signage and Wardening, Protection of Breeding Habitat, and Reducing Exposure to Lead Tackle (COLO-2)*

3.2.1.2.1. Restoration Objective

The goal of this restoration alternative is to enhance common loon productivity and survival during the nesting season, with emphasis on breeding sites throughout New England. This restoration relies on a variety of management techniques that have been utilized successfully throughout the Northeast for more than 40 years (Evers et al. 2009; LPC 2011).

3.2.1.2.2. Summary of Proposed Activity

This project takes a comprehensive approach to increase the survival and productivity of nesting common loon, through a variety of management actions that have been successfully implemented in the Northeast (Evers et al. 2009; LPC 2011), including artificial nests (using moored, floating rafts), nest site protection through signage and wardening, protection of breeding habitat, and decreasing adult common loon mortality due to consumption of lead fishing tackle through public education and a lead-tackle exchange program. Several of the techniques have also been used to successfully restore common loon following other oil spills in New England (protection of breeding habitat – North Cape oil spill [Evers et al. 2019] and reducing exposure to lead tackle and installing nesting rafts – Sanborn Pond oil spill). In addition, the same suite of project activities were chosen to restore common loon injuries associated with the Deepwater Horizon Spill (Open Ocean Trustee Implementation Group 2018). A summary of each of the proposed activities under this restoration project follows.

- Artificial Nest Sites (Rafts)

Rafts have been used to minimize the negative effects of fluctuating water levels, shoreline development, predation and other human uses on nesting common loon (Merrie 1996; Hancock 2000; DeSorbo et al. 2007; Kenow et al. 2013). Rafts, that float up and down, can withstand the effects of fluctuating waters that can flood or strand natural common loon nests. They also act as small islands, and can help protect nesting common loon from mammalian predators and reduce effects of habitat alteration and disturbance associated with shoreline development.

Rafts have been in use as a management tool for more than 40 years (LPC 2011), so their limitations and benefits are well known. Not all rafts end up being utilized by common loon; in New Hampshire, the average occupancy rate was 43 percent (Evers et al. 2009). However, common loon that utilized rafts on lakes with fluctuating water levels had higher nesting success (approximately 33 percent) than common loon utilizing natural nests on similar lakes (DeSorbo et al. 2007). Even greater nesting success (53 percent) is expected to be achieved at sites that are subject to high levels of human disturbance and have the greatest potential to increase loon productivity (Evers et al 2009). Avian predator guards typically constructed of wire mesh are frequently fitted over the rafts to reduce avian predation and increase productivity further. To achieve the greatest benefits to productivity, proper placement is critical and suitable locations removed from shoreline development and high recreational use are preferred.

- Signage and Wardening

Signage and nest wardening can increase productivity by encouraging people to avoid nesting common loon. When common loon are disturbed, they frequently flush (or leave) the nest, causing their eggs to be at increased risk of predation and compromised incubation (Kelly 1992; Steinkamp and ACV 2008; Hammond 2009). In Montana, Kelly (1992) found that voluntary closures around nests (established by floating signs) increased the percent of successful nests from 65 percent to 73 percent, and in Vermont, Hanson and Klem (undated) found that signage increased the percent of successful nests at high human exposure sites from 55 percent to 81 percent. To achieve these increases in productivity, site selection is key and limited to specific locations.

Active wardening may also create a more informed citizenry, resulting in additional protection of nesting common loon. New England regional common loon recovery programs have been using outreach efforts in combination with nest signage at selected nests for years, in some cases since the late 1980s (Hanson and Klem undated; LPC 2011; Maine Audubon undated).

- Protection of Breeding Habitat

Nest site protection through land preservation is expected to prevent future losses to common loon by preventing expected decreases in productivity associated with shoreline development. Shoreline development can adversely affect habitat quality by (1) modifying and/or removing vegetation and substrate; (2) enhancing predator densities; (3) increasing human activity; and (4) decreasing water quality and forage species availability. All of these effects can reduce productivity both indirectly and directly.

Protecting shoreline surrounding common loon nests has been utilized to prevent declines in nesting, productivity and adult survival (LPC 2011; Evers et al. 2019). To achieve the greatest benefits, conservation projects should be carefully selected and focus on lakes with the highest quality habitat and highest productivity rates (Evers et al. 2019). The length of protected shoreline should be maximized to protect entire loon territories (or areas that pairs regularly frequent and defend), if possible. Lakes with a greater overall proportion of protected shoreline are preferred over lakes with less protected shoreline and more development. Vegetated buffers of no less than 150 meters should be maintained between nesting sites and developed land (Hammond 2009).

- Reducing Exposure to Lead Tackle

Decreasing common loon exposure to lead tackle is expected to reduce deaths of breeding adults. According to Grade et al. (2018), toxicosis from ingestion of lead sinkers and jigs (lures) caused 48.6 percent of collected adult common loon mortality in New Hampshire with jigs accounting for the greatest proportion of objects removed from deceased individuals (52.6 percent). Gallo et al. (2017) also showed that lead poisoning accounted for 28 percent of collected deceased adult common loon in Maine, with fishing jigs accounting for 58 percent of the objects removed from dead loons.

Regulations prohibiting the use and sale of lead sinkers and jigs vary across New England. Several states prohibit the freshwater use of lead sinkers and jigs with a total weight of 1 ounce or less (New Hampshire, Maine [unpainted] and Massachusetts), while Vermont prohibits the use of lead sinkers weighing ½ ounce or less. While the northern New England states prohibit the sale of lead sinkers and jigs, Massachusetts, Connecticut and Rhode Island allow the sale of lead fishing tackle. Additionally, no states prohibit the possession of lead fishing tackle, resulting in greater risk of inadvertent use throughout New England.

Because common loon are a long-lived species, do not breed until their sixth year, and have low annual productivity (0.53 chicks fledged/pair [Evers et al. 2010]), adult survivorship is critical to population viability. The Trustees anticipate increasing adult survival rates by funding: 1) outreach efforts that educate anglers about lead toxicity in common loon; and 2) tackle exchange programs to help reduce the use of lead jigs and sinkers weighing 1 ounce or less. Pilot education and collection programs have begun by others in New Hampshire and Maine. In New Hampshire in 2018, 4,786 pieces of tackle, or 29 pounds of lead, were collected through exchange programs. Additional funding would allow these types of programs to expand their reach and effectiveness.

The Trustees will identify and select specific sites for the four project activities (Artificial Nest Sites, Signage and Wardening, Protection of Breeding Habitat, and Reducing Exposure to Lead Tackle) through a competitive grant process. The USFWS will post an announcement of the availability of funding (up to $3,185,000) for the Restoration of Common Loons in New England on www.grants.gov. Interested agencies, organizations, and individuals will have 60 days to apply for the competitive funding. Organizations can submit project ideas that include multiple management activities or only one activity. Projects throughout New England will be eligible. The

Trustees will use the evaluation criteria in Section 2.2., along with the following additional information to evaluate and select project proposals:

a. number of common loon (or pairs) likely to benefit;
b. expected effects of project proposal on common loon productivity and adult survival;
c. site location (must be located within New England);
d. habitat area and quality;
e. cost effectiveness; and
f. performance monitoring protocols; including availability of existing baseline information.

3.2.1.2.3. Monitoring and Measurable Results

A common loon monitoring program will be required by each project proponent to determine if the restoration project is meeting established objectives and to gauge project success. Nesting data associated with raft use, locations with signage and wardening, and protected shorelines will be required on an annual basis for the period of time in which project funding allows (typically 3-5 years). Recorded data are expected to include, but are not limited to, the following: numbers of territorial and nesting pairs; numbers of eggs, chicks, and fledges; presence of signage/wardens; and any other pertinent details relating to interactions with the public. When possible, these data should be compared to historical data, or data from nest locations without rafts, nest signage and wardening, and protected shorelines. These results will help inform the potential success of these restoration actions.

In addition, for land acquisition projects, the properties will be required to be protected in perpetuity (via fee acquisition or conservation easement), managed for conservation, and monitored annually by the project proponent(s) to ensure the terms of the deed restriction or conservation easement are being met (e.g., no human encroachments, illegal timber harvesting, or other unsupported activities).

For projects aimed at reducing common loon exposure to lead tackle, annual evaluation reports will be prepared summarizing the project's development and implemented outreach activities and tackle exchange efforts. These reports will highlight results of outreach activities, including the number and type of activities, number of participants, targeted audience (boaters, swimmers, and anglers), location, and number of participation hours.

3.2.1.2.4. Evaluation of the Alternative

High Importance: *Nexus – Spatial Proximity within Affected Area, Same or Similar Species*: This restoration alternative directly and indirectly compensates for injuries to common loon in areas affected by the Spill. Restoration of common loon in northern New England is expected to help compensate for losses that occurred to the population in those states. In addition, restoration of breeding common loon in Massachusetts and northern New England should increase the overall loon population wintering in Buzzards Bay.

Restoration projects aimed at increasing productivity through rafts or via signage and wardening are expected to directly generate additional DBYs. Specifically, utilizing life history inputs from Table 1 and average estimates for increased productivity for rafts (0.53 increase compared to natural nests at high risk sites) and signage and wardening (0.17), the Trustees anticipate that each raft will generate approximately 13.5 DBYs over a 20-year deployment period, while signage is expected to generate approximately 8.2 DBYs/nest over a 20-year period. It should be noted that deployment periods less than 20 years would result in reduced DBYs/nest. The Trustees estimate that a 20-year deployment of 100 rafts would likely generate a total of 1,350 DBYs, or approximately 34 percent of the injury, while a 20-year signage program at 100 nests would generate a total of 820 DBYs, or approximately 20 percent of the injury.

Land protection projects are expected to prevent future losses of common loon nests and reductions in productivity. Protection projects will prioritize sites with high quality habitat and high productivity to maximize potential project benefits.

Outreach activities and tackle exchange programs are difficult to measure in the context of compensated DBYs, and their compensation is considered indirect. However, the Trustees acknowledge the value of involving and educating the public about important issues relating to common loon conservation, (i.e., lead poisoning). Decreasing the number of adult common loon deaths due to lead poisoning will prevent the loss of future common loon DBYs.

Medium Importance: *Project Implementation Readiness, Technical Feasibility/Likelihood of Success of Project; Sustainability of Resource Benefits, and Cost/Cost Effectiveness*:
Artificial nests, signage and wardening, and breeding habitat protection are well understood and commonly utilized throughout New England. Regional common loon recovery programs have been using outreach efforts in combination with management efforts at selected nests for years, in some cases since the late 1980s (Hanson and Klem undated; LPC 2011; Maine Audubon undated). Increased outreach combined with other restoration efforts have proven successful in other regions as well (Hammond 2009). For raft and signage management projects, benefits are limited to the duration of the project (this is expected to vary, but likely will range from 5-20 years); however, for land protection projects, benefits are expected to last in perpetuity. Benefits from outreach and tackle exchange programs should be greatest during the period of active project implementation; however, benefits will extend as public awareness about the dangers of lead toxicity increases.

Raft and signage and wardening programs are labor intensive, requiring construction (for rafts), installation, and removal efforts in oftentimes-remote areas. Annual monitoring to identify nest usage and productivity requires multiple trips. In developing a settlement with the Responsible Party, the Trustees estimated the cost of implementing a 20-year raft program to be $24,520/raft, or $1,811/DBY. The estimated cost for a signage and wardening program was $19,784/nest, or $2,423/DBY. Land protection costs are considerably greater and vary widely. Based on the Trustees analysis of a number of previously protected nest sites, the cost associated with land protection ranged from $534,000 to $1,317,000/nest, or $10,500/DBY - $43,000/DBY. Land protection costs depend on a number of factors, including whether additional funds can be

leveraged, whether the price of the parcel is at or reduced from the appraised value, and the size and location of the parcel. For raft and signage projects, cost effectiveness increases when the potential to increase productivity is high (i.e., nesting sites are limited or human disturbance concerns are significant). For land protection projects, effectiveness increases when productivity is high and land protection costs are low due to the availability of willing owners to sell, low-cost property, and matching funds for securing properties. Cost effectiveness will be evaluated for each of the specific project proposals during the grant review process.

Low Importance: *Impact Avoidance or Minimization, Level of funding needed, Community Involvement*:
The Trustees do not anticipate that any of the project actions included in this restoration alternative will have adverse impacts to common loon or the areas of implementation.

The Trustees are proposing to utilize up to $3,185,000 of the settlement funds to restore common loon throughout New England using a combination of the different project actions described under this alternative. The Trustees believe that funding a variety of project actions at multiple sites in New England is the best approach to ensure a successful restoration.

Community involvement is expected to be greatest in the signage and wardening and the outreach and tackle exchange projects.

3.2.2. Common Loon Restoration – Non-Preferred Alternatives

3.2.2.1. Gill Net Permit Buyout and Outreach

3.2.2.1.1. Restoration Objective

The objective of this alternative is to reduce mortality of wintering adult common loon resulting from entanglement and drowning due to gill net and other fisheries operations.

3.2.2.1.2. Summary of Proposed Activity

Each year, a significant number of diving birds are killed by gill nets anchored off the Atlantic coast. Estimates are likely to be low because offshore winds reduce the number of birds that wash ashore, scavenging by gulls reduces the residence time of birds on the beaches, and some fishers keep dead birds. A study conducted from February through April of 1998 found over 65 percent of the birds recovered on beaches were red-throated loon and about 18 percent of the birds found dead on beaches were common loon (Forsell 1999). In New England, the majority of gill net operations are small-scale fishing operations confined to coastal waters (Žydelis et al. 2009).

The goal of the gill net permit buyout project is to purchase and retire non-Tribal gill net licenses off the coast of New England. The project proponent would use funds to purchase gill net licenses from willing participants. As part of the buyout process, permit holders will be given information pertaining to sustainable fish management and methods, and ways to modify gear to achieve goals that are mutually beneficial to seabirds and permit holders (SB 2019).

3.2.2.1.3. Monitoring and Measurable Results

The proposed project would require ongoing monitoring to be conducted by the project proponent.

3.2.2.1.4. Evaluation of the Alternative

While a gill net permit buyout program may reduce deaths of adult common loon, this type of action would be difficult to monitor and may not be feasible. Coastal fisheries are often operated by local fishermen involving a large number of small vessels; therefore, buyout programs are logistically difficult to implement, inherently difficult to monitor, and can be costly (Bentzen and Robards 2014). It is unclear whether enough permits could be purchased to make a significant difference to common loon. According to Bentzen and Robards (2014), successful mitigation of the gill net fishery problem will require support from government agencies and fishers, who have been documented as unwilling to participate (Senko et al. 2014). Other implemented buyout programs have experienced decreased observer coverage of gill net fisheries, resulting in decreased monitoring and data to determine the actual success of the program (STRP 2011). History has also shown that when buyout programs are implemented, regulations are sometimes changed to allow the sale of more licenses or fishing effort of existing permit holder increases substantially. After buyouts, existing vessels increased their effort levels and older vessels were replaced by larger, more efficient ones, reducing the effectiveness of the program (Holland et al. 1999). Due to the overall difficulties, limited feasibility and uncertainties associated with implementing a gill net permit buyout program, this alternative is non-preferred.

3.2.2.2. Rehabilitation and Rescue of Adult Common Loon

3.2.2.2.1. Restoration Objective

The purpose of this restoration alternative is to enhance and expand the capabilities of organizations that rescue, rehabilitate, and release recovered birds impacted by spill events to reduce future mortality of adult common loon.

3.2.2.2.2. Summary of Proposed Activity

Previous studies of common loon mortality have documented oil spill contamination as one of several leading causes of death (Forrester et al. 1997; Augspurger et al. 1998; Daoust et al. 1998). The presence of oil on feathers disrupts waterproofing and thermoregulation (Sidor et al. 2003). There are only a handful of professional organizations with the training and expertise required to respond to a major spill event in the United States. Rescue and rehabilitation are complex, expensive, time-consuming, and have variable success rates (Anderson et al. 1996; Mazet et al. 2002; Fiorello et al. 2017). This project would increase funding to bird rescue organizations tasked with responding to oil spills to increase trained staff, and enhance supplies and equipment necessary to improve the efficacy of rescue and rehabilitation.

3.2.2.2.3. Monitoring and Measurable Results

The proposed project would require ongoing monitoring and maintenance to be conducted by the project proponent.

3.2.2.2.4. Evaluation of the Alternative

The potentially responsible party (PRP) is ultimately responsible for the costs of bird rescue and rehabilitation, so this alternative would not meet the Trustees' eligibility requirements except from "mystery" spills where a PRP has not been identified. In those circumstances, this alternative may help prevent the death of adult common loon due to oiling; however, it would not actively create or generate additional DBYs. Furthermore, because impacts to overall bird fitness from a spill and resulting rescue and rehabilitation efforts can vary, it is difficult to determine the potential success of this type of project. Studies have compared the survival of rehabilitated birds impacted by oil to unoiled birds. Those birds that were oiled and subsequently rehabilitated either did not survive or breed as successfully when compared to unoiled individuals, or there was no statistical difference between the two groups. Differences in survival and the ability for birds to thrive appeared to be dependent upon whether rehabilitation facilities were appropriately designed and equipped, training of staff and volunteers, and medical management. In addition, the re-sighting rates of rehabilitated birds are low, making it difficult to compare success rates of oiled versus unoiled birds. Because this alternative does not directly generate additional DBYs, and because the potential success may be limited and is difficult to measure, this alternative is non-preferred.

3.3. Other Birds Restoration Alternatives

3.3.1. Other Birds Restoration – Preferred Alternatives

As described in Section 1.6.2., Trustee analysis indicates that approximately 545 birds of various species (e.g., rocky island colonial-nesting birds, pelagic sea birds, red-throated loon and grebe, diving ducks, and other waterfowl (Table 3) were killed as a result of the Spill and 3,384 DBYs were lost. In the judgment of the Trustees, implementing separate, relatively small restoration projects for each of the impacted bird species would not be as beneficial or cost-effective as a single, combined restoration project that benefits multiple species. Therefore, to restore losses to these birds, the Trustees focused on projects that directly and indirectly benefit a broad number of impacted species, as well as projects that specifically restore common eider. The Trustees focused on restoration projects for the common eider because more than 50 percent of the other birds killed by the Spill are diving ducks (e.g., scoters, mergansers, and common eider), with the common eider representing the highest number of estimated mortalities (Table 3).

A total of $490,000 is available to implement, oversee and monitor the restoration of other bird species in Massachusetts. In Rhode Island, a total of $1,274,000 is available for restoration of other birds and common loon (as described in Section 1.7., approximately 10 percent of the loon settlement funds have been combined with the other bird funds allocated for restoration in Rhode Island). Because common loon do not breed in Rhode Island, loon restoration will focus on efforts to improve wintering habitat along the Rhode Island coast.

The Trustees propose to fund two restoration projects to restore impacts to other birds (and common loon in Rhode Island). The first is Habitat Protection and the second is Common Eider Nest Site Management. Under Habitat Protection, the Trustees are proposing to fund two projects: one in Massachusetts and one in Rhode Island. In addition, a Common Eider Nest Site

Management project is proposed in Massachusetts to improve eider nesting success through various management actions.

3.3.1.1. Habitat Protection (OB-1)

3.3.1.1.1. Restoration Objective

The goal of this restoration project is to acquire and permanently protect habitat for injured bird species in the Other Bird category that breed, migrate through, and overwinter off the coast of New England, with emphasis on areas injured by the Spill.

3.3.1.1.2. Summary of Proposed Activity

Other Birds killed by the Spill include rocky island colonials, pelagic seabirds, red-throated loons and grebes, diving ducks, and other waterfowl. The focus of this restoration alternative is on efforts to protect habitat that is utilized for both breeding and overwintering. Habitat protection offers a practical, effective means of preventing future losses of productivity for nesting species that would be directly impacted by habitat loss and degradation associated with future development. Protection also indirectly benefits migrating and wintering birds by preventing habitat loss due to development and by preventing ecological impacts of future land development, which can negatively affect water quality in wetlands and ponds that provide food to these birds. The Trustees have identified the following parcel for protection in Massachusetts:

- *Cuttyhunk Island, Gosnold, Massachusetts (OB-1MA)*
  Cuttyhunk Island is a 581-acre island located off the coast of Massachusetts in Buzzards Bay (Figure 4). The island is comprised of a variety of coastal habitats in near pristine condition, including ponds, freshwater wetlands, salt marshes, marine cliffs, barrier beaches, shrublands, forests and grasslands. The shallow water coastline is characterized by substantial eelgrass beds, tidal flats, and rocky reefs. Because of its offshore location and limited development, water and sediment quality are high and numerous species of birds, shellfish and finfish are found. The Island has been identified as a "Key Site," or highest priority for conservation, in the Massachusetts State Wildlife Action Plan.

  More than 250 bird species have been sighted and reported from Cuttyhunk (eBird 2019), including all of the species impacted by the Spill (except razorbill). The Island provides important nesting, foraging and resting habitats and it is particularly important to a variety of migratory birds that use the diverse landscapes during migration. Several of the bird species impacted by the Spill nest on Cuttyhunk, including common eider, Canada goose, American black duck, herring gull, great black-backed gull, American oystercatcher, and federally threatened piping plover. Although nesting surveys have not been conducted for common eider, duckling crèches have been observed in the surrounding waters (Paton et al. 2005; Heusmann and Trocki, in review; eBird 2019; Heusmann 2019, unpublished).

  The Island is largely undeveloped and privately owned. Residential development has begun to expand and spread from the town center. The bulk of the land is controlled by three separate ownership groups and it is vulnerable to development. The BBC is currently leading an effort to protect part of the Island in combination with the Town of

Gosnold Conservation Commission and the Massachusetts Department of Conservation and Recreation (collectively, the project partners). The BBC has negotiated a contract to purchase significant land holdings from two landowner groups and have received a letter of intent to donate a conservation restriction from a third landowner. With combined funding support from private, State, and Federal stakeholders, the project partners' efforts would permanently protect over 300 acres of high priority habitat (MassWildlife 2015), including over 5 miles (8 km) of undeveloped shoreline. The total acquisition project cost is $7,000,000. Residents of the Town of Gosnold voted unanimously to contribute $400,000 to the BBC's effort. The Town's share includes grants from Naushon Island's Beech Tree Trust and the Gosnold Fund at the Community Foundation of Southeastern Massachusetts. The project has also been awarded $700,000 in State grants, $1 million from the USFWS National Coastal Wetlands Conservation Grant Program, and $1.75 million in private donations. The BBC seeks to raise the remaining funds (approximately $3,150,000) from additional private contributions, and other Federal grants (including funds from the Trustees).

The Trustees propose to contribute all of the settlement money allocated for Other Birds Restoration in Massachusetts, or $500,000 ($490,000, plus interest earned), to the Cuttyhunk Land Protection project to protect other bird species in Massachusetts.

Figure 4. Cuttyhunk Island fee acquisition (red) areas and conservation restriction (orange), Gosnold, Massachusetts.

The Trustees will identify and select a similar habitat protection project in Rhode Island (OB-2RI) from land protection projects already known to the Trustees or through a competitive grant process. The USFWS will post an announcement of the availability of funding (up to $1,274,000) for the Restoration of Other Birds and Common Loon in Rhode Island on www.grants.gov. Interested agencies, organizations, or individuals will have 60 days to apply for the competitive funding. The Trustees will use the evaluation criteria in Section 2.2., along with the following additional information to evaluate and select project proposals:

a. type and number of species likely to benefit;
b. site location and degree of oiling (must be located in Rhode Island);
c. habitat area and quality;
d. whether additional funds can be leveraged; and
e. expected effects of habitat protection on other bird and common loon productivity and adult survival.

3.3.1.1.3. Monitoring and Measurable Results

The properties will be required to be protected in perpetuity (via fee acquisition or conservation easement), managed for conservation, and monitored yearly by the project proponent to ensure the conservation goals are being met (e.g., no encroachment, unauthorized trespassing).

3.3.1.1.4. Evaluation of the Alternative

High Importance: Nexus – *Spatial Proximity within Affected Area, Same or Similar Species*:
Cuttyhunk Island is located in Buzzards Bay and was exposed to oil during the Spill. Twenty-five dead birds (or 5 percent of the total number of collected birds) were recovered from the Island. Protecting land on Cuttyhunk would directly benefit habitat and species affected by the Spill. In Rhode Island, the Trustees will focus on coastal habitat protection with a preference for areas impacted by the Spill. The Trustees recognize the importance of compensating the public of Rhode Island for its loss to natural resources and services caused by the Spill. Properties selected for protection by this restoration alternative will directly and indirectly compensate for injuries to species in the Other Bird category and to the public of Massachusetts and Rhode Island.

Medium Importance: *Project Implementation Readiness, Technical Feasibility/Likelihood of Success of Project, Sustainability of Resource Benefits, and Cost/Cost Effectiveness*:
The BBC has negotiated a purchase and sale agreement for the Cuttyhunk Island land acquisition and conservation restriction. Permanent protection of the property on Cuttyhunk Island is likely to be secured by the end of 2019 or very soon after. Without settlement funds from the Spill, it is uncertain whether this property could be acquired. Land protection in Rhode Island will be facilitated through a competitive grant and should be accomplished within about a year. The Trustees believe that both the Cuttyhunk Island project and coastal habitat protection in Rhode island are feasible, likely to be successful, and will provide benefits to other bird species in perpetuity. It is expected that both projects will leverage additional funding from outside sources, increasing their cost-effectiveness. In the event that the Cuttyhunk Island project is not successful, the Trustees will issue a grant solicitation (similar to the one for Rhode Island) to purchase one or more other properties that will benefit the injured bird species.

Low Importance: *Impact Avoidance or Minimization, Level of funding needed, Community Involvement*:
The Trustees do not anticipate that this restoration alternative will have any significant adverse impacts to the areas of implementation. The proposed level of funding is commensurate with the level of impact to these species groups in Massachusetts and Rhode Island. There is tremendous community support for the Cuttyhunk Island project. In Rhode Island, the Trustees will also seek to find a coastal habitat protection project with community support.

3.3.1.2. Common Eider Nest Site Management (OB-2)

3.3.1.2.1. Restoration Objective

The objective of this restoration project is to protect breeding common eider nest sites in Massachusetts (Boston Harbor Islands and Cuttyhunk Island) from disturbance, such as human presence with on- and offshore signage and active nest monitoring and wardening during potential peak disturbance events.

3.3.1.2.2. Summary of Proposed Activity

The southern extent of the common eider breeding range is located in Massachusetts, and the population has expanded in recent years. Common eider is a semi-colonial ground-nesting species that has been documented to nest in large numbers and high densities on four islands in the Boston Harbor Islands National Park Area: Calf Island, Outer Brewster Island, Middle Brewster Island, and Gallops Island (Parsons and Jedrey 2013). The birds are sensitive to recreational activities during the breeding season that cause nesting hens to flush from nests, leaving hens, eggs, and chicks vulnerable to predators. In addition, offshore disturbances negatively impact duckling survival when in close proximity to large, multi-family groups of fledgling ducklings, or crèches. Off- and onshore signage would increase productivity by encouraging people to avoid the nest vicinity. Active nest wardening during peak boating activity would limit and/or prohibit access to breeding bird islands and would promote increased nesting productivity for these eider populations. Active nest wardening requires additional coordination and enforcement. On Cuttyhunk Island, nest monitoring will be undertaken to determine the extent of the nesting eider population and to identify management actions that may be implemented to increase nesting success.

The Trustees propose to allocate up to $100,000 to Common Eider Nest Site Management in Massachusetts. These funds will be distributed to the landowners in Boston Harbor and Cuttyhunk Island (National Park Service and Buzzards Bay Coalition) to implement monitoring and management activities.

3.3.1.2.3. Monitoring and Measurable Results

The proposed project includes a common eider monitoring program to determine if the restoration project is meeting established objectives. Nesting data associated with the use of signage and island closures will be required on an annual basis and for a period of time in which project funding allows. Recorded data should include, but are not limited to, the following: number and location of active common eider nests, ducklings, and duckling crèches, and any other pertinent details relating to interactions with the public and observations of ground

predators. If possible, this same information should be collected at nest locations without signs and closures for comparison purposes.

3.3.1.2.4. Evaluation of the Alternative

High Importance: *Nexus – Spatial Proximity within Affected Area, Same or Similar Species*:
Diving ducks make up a significant proportion of the Other Bird loss, and common eider experienced the greatest injury among the diving ducks. Common eider nesting has been documented on several islands of the Boston Harbor Island area and at Cuttyhunk Island. This restoration alternative directly benefits common eider, which represent a large proportion of the birds injured in the Other Birds category.

Medium Importance: *Project Implementation Readiness, Technical Feasibility/Likelihood of Success of Project, Sustainability of Resource Benefits, and Cost/Cost Effectiveness*:
Signage and wardening are well understood and already being successfully implemented in areas throughout New England for a variety of species. There is also a significant amount of technical expertise and experience specific to common eider that makes these activities all the more feasible and likely to succeed. Monitoring and nest site protection activities at Cuttyhunk Island will further ensure the long-term success of the Trustees proposed land conservation efforts designed to benefit common eider. Monitoring and management efforts are relatively low-cost and help to ensure that restoration goals are met.

Low Importance: *Impact Avoidance or Minimization, Level of funding needed, Community Involvement*:
The Trustees do not anticipate that this restoration alternative will have any significant adverse impacts to the common eider or to the areas of implementation. This project can be accomplished for a relatively small proportion of the funding allocated for other birds and it helps support and ensure benefits to common eider resulting from the other preferred alternative (land protection) in Massachusetts. Community involvement may be possible through the use of volunteers who participate in monitoring.

3.3.2. Other Bird Restoration – Non-Preferred Alternatives

3.3.2.1. Prey Enhancement

3.3.2.1.1. Restoration Objective

The goal of this restoration project is to enhance the fitness, survival and reproductive potential of common eider by augmenting the common eider's prey base through construction of artificial food resources off the coast of southern New England.

3.3.2.1.2. Summary of Proposed Activity

Common eider prey on aquatic invertebrates, especially mollusks, crustaceans, and sea urchins. Surveys suggest the southern extent of the common eider population has been increasing (Heusmann and Trocki in review), while numbers in the Gulf of Maine (GOM) have been decreasing. A possible explanation for this shift is that birds are following their food source. According to Sorte et al. (2017), wild blue mussels, a preferred food source of the common eider, are disappearing in the GOM, and have declined by more than 60 percent in the past 40 years.

Experts suspect that those birds breeding and overwintering off the coast of southern New England are finding more abundant alternative food sources (Maine Department of Inland Fisheries and Wildlife, personal communication). This proposed activity would further enhance common eider prey in the southern portion of its range by implementing mussel propagation through aquaculture techniques.

3.3.2.1.3. Monitoring and Measurable Results

The proposed project includes provisions for ongoing monitoring and maintenance to be conducted by the project proponent.

3.3.2.1.4. Evaluation of the Alternative

Shellfish restoration projects have already been implemented as part of the Final Programmatic Restoration Plan and Environmental Assessment for the Buzzards B-120 Oil Spill Shoreline, Aquatic, and Natural Resource Use Injuries (NOAA et al. 2014). In the context of this RP, the compensation for DBYs is indirect and uncertain, as it is not known if food sources are limiting in overwintering areas in Massachusetts. Additionally, the cost and level of effort needed to create a significant, sustainable food source are likely high compared to the uncertain benefits. As an example, a small flock of ducks can decimate a shellfish farm in a short period of time (Richman 2013). Because utilizing aquaculture as a prey source is a learned behavior in common eider (Richman 2013), this restoration option may also conflict with previous efforts to restore shellfish impacted by the Spill.

3.4. Summary of Preferred Restoration Alternatives

The preferred restoration alternatives include specific restoration projects in two categories of injured birds: (1) common loon and (2) other birds injured during the Spill. A summary of the projects that have been included as the preferred restoration alternatives is provided in Table 7.

For common loon, a suite of project types (e.g., translocation, rafts, signs and wardening, breeding habitat protection and outreach and lead tackle exchange programs) is proposed to restore the loss, and for other birds, two types of projects (habitat protection and common eider nest site management) are proposed.

Common loon restoration is directed at addressing primary threats to species productivity during the breeding season (habitat loss and alteration due to shoreline development, human disturbance and toxicosis from ingesting lead fishing equipment). The proposed suite of project actions—translocation, rafts, signs and wardening, breeding habitat protection and outreach and lead tackle exchange programs—directly addresses these critical threats to common loon that winter in Buzzards Bay. In addition, a relatively small proportion of funds (about 10 percent) are targeted to indirectly benefit common loon that winter in Rhode Island. Together, the projects are expected to return the injured common loon population to baseline by creating new nesting pairs, increasing reproductive success, and decreasing adult mortality. The Trustees approach also generates restoration benefits to common loon throughout New England. This will provide benefits to people both in the area of the Spill and in areas of New England that were affected when nesting common loon were killed as a result of the Spill.

A variety of actions are proposed to take advantage of available opportunities and to maximize the likelihood of success; locations for translocation, rafts, signage and breeding habitat protection programs may be limited and should be carefully selected to achieve the best results. The Trustees approach allows for the best management techniques to be utilized in any given area and protects against risks associated with only choosing one or two strategies that may have limited success in some situations.

The Trustees' preferred alternatives rely upon four commonly used techniques that have a high likelihood of success using approximately one-half of the settlement funds. The Trustees propose to use the other half of the funds for loon translocation, a promising, relatively new strategy for common loon, which if successful, would most efficiently restore injured common loon and has the potential to generate benefits over the long term. Furthermore, this strategy, which has been successfully implemented for numerous other species, could have broad-reaching applications for future common loon restoration efforts.

The preferred alternatives will focus on selecting specific restoration projects that demonstrate cost effectiveness and maximize benefits. Translocation, rafts, and signage and wardening programs are labor intensive and can be costly; however raft and signage and wardening programs can be scaled to reduce costs, and can be situated to maximize benefits. Outreach and lead tackle exchange programs are relatively low-cost methods for reducing mortality of adult common loon, though the direct benefits are often difficult to quantify. Protecting breeding habitat through land acquisition is generally the most expensive approach, but the Trustees will expect to minimize settlement fund use by supporting projects that leverage other funding sources. Land protection is also more certain to generate benefits over the long term (by preventing the loss of existing common loon nests) and is often the only option available in areas where rafts or signage may not be suitable or highly beneficial to common loon.

To restore losses to other birds, the Trustees focused on projects that directly and indirectly benefit a broad number of impacted species, as well as projects that specifically restore common eider. Habitat protection projects in Massachusetts and Rhode Island will target impacted resources in the vicinity of the Spill. They are technically feasible, have a high likelihood of success, are relatively cost-effective due to expected leveraged funds, and are sustainable in perpetuity. These preferred alternatives can be implemented within a relatively short period of time, providing restoration benefits quickly; and they have broad community support.

None of the proposed alternatives are expected to have adverse effects on public health and safety.

Table 7. Preferred Restoration Alternatives.

Project ID Number		Proposed Activity	Trustee Funding/Contribution
Common Loon Restoration			
COLO-1		Common Loon Restoration through Translocation and Captive Rearing	$3,185,000
COLO-2		Common Loon Restoration through Artificial Nest Sites, Signage and Wardening, Protection of Breeding Habitat, and Reducing Exposure to Lead Tackle	$3,185,000
Other Bird Restoration			
OB-1		Habitat Protection	
	OB-1MA	Massachusetts	$500,000
	OB-1RI	Rhode Island	$1,274,000
OB-2MA		Common Eider Nest Site Management	$100,000
Total*			$8,244,000

* Total includes current interest earned on settlement funds; additional interest may be allocated to projects as well as trustee administrative and oversight costs.

3.5. Other Alternatives Considered But Not Fully Evaluated

Several alternatives were considered prior to the release of this Draft RP. These projects were believed to provide minimal benefits, were already being implemented, or were logistically difficult to implement (Table 8). A summary of those projects are included but not evaluated further.

Table 8. Projects considered but not fully evaluated.

Proposed Activity	Justification
Common Loon Restoration	
Population monitoring and research	No direct compensation for loss Already being implemented
Create marine sanctuary to protect wintering habitat	No direct compensation for loss Cost prohibitive Logistically difficult: remote locations, political feasibility Spatially limited Difficult to measure success
Other Bird Restoration	
Protect breeding habitat in northern extent of range (Canada)	No direct compensation for loss Cost prohibitive Logistically difficult: remote, international locations Spatially limited
Predator control to increase productivity	Conflicts with other species management objectives: gulls Short-term benefit Variable success
Population monitoring and research	No direct compensation for loss Already being implemented

4. NEPA Compliance

NEPA (42 U.S.C. §4321 *et seq.*) and CEQ regulations implementing NEPA (40 C.F.R. Parts 1500-1508) apply to NRDA restoration actions by Federal trustees, except where a categorical exclusion (CE) or other exceptions to NEPA apply (15 C.F.R. §990.23). Federal agencies may identify categories of actions which do not individually or cumulatively have a significant effect on the human environment (40 C.F.R. §1508.4) (e.g., actions with limited degree, geographic extent, and duration). Actions falling into those categories may result in the exercise of a CE and are exempt from the requirement to prepare an environmental assessment or environmental impact statement.

DOI has established regulations for the implementation of NEPA, including actions that are categorically excluded (36 C.F.R. 220.6). This includes "Resource Management" actions, including NRDA restoration plans prepared under OPA and CERCLA, as described in DOI Department Manual 6, Section 516, Chapter 8.5 (516 DM 8.5). NOAA has its own guidelines for exercising categorical exclusions, as provided in its Companion Manual to NOAA Administrative Order 216-6A, Policy and Procedures for Compliance with the National Environmental Policy Act and Related Authorities (Companion Manual). NOAA Categorical Exclusion "G1" is for "routine administrative actions," including those under OPA and is found in the Companion Manual's "List of NOAA's Categorical Exclusions." As NOAA's activities related to this Draft Restoration Plan have been

administrative in nature (i.e., activities performed as the LAT), NOAA intends to apply Categorical Exclusion G1 to satisfy NEPA compliance for this Draft RP.

The Federal Trustee agencies have preliminarily determined that the proposed activities associated with this Draft RP qualify for one or more of their respective agency CEs and would not have individual or cumulative significant effects on the human environment. DOI and NOAA will confirm, in the Final RP, the CEs relied upon for NEPA compliance.

5. Compliance with Statutes, Regulations, and Policies

5.4. Federal Statutes, Regulations, and Policies

Federal Statutes, Regulations, and Policies	Compliance
Oil Pollution Act of 1990 (OPA, 33 U.S.C. §§2701, et seq., 15 C.F.R. Part 990)	The Trustees have released this Draft RP for public review and comment, and will take into consideration public comments received during the comment period and incorporate revisions into the Final RP, as needed. The Trustees will select the restoration projects that best address natural resource and resource use injuries resulting from the Spill.
National Environmental Policy Act (NEPA, 42 U.S.C. §§4321, et seq., 40 C.F.R. Parts 1500-1508)	This document has been developed in compliance with NEPA. As the Trustees' actions are not anticipated to have any significant effects on the environment, and as existing USFWS CEs under NEPA cover these actions, no additional analysis under NEPA is required at this time. Formal NEPA compliance documentation will be published along with the Final RP, in which the Trustees will make their official selection of restoration projects.
Clean Water Act (CWA, 33 U.S.C. §1251, et seq.)	Any necessary applications for 404 General Permits to the U.S. Army Corps of Engineers will be filed in compliance with this Act
National Historic Preservation Act (16 U.S.C. §470 et seq.)	The USFWS will consult with the State Historic Preservation Office and the Advisory Council for Historic Preservation on any projects that could involve historic and/or cultural resources. Project designs may be modified based upon these consultations, if necessary.
Rivers and Harbors Act (RHA) (33 U.S.C. §401 et seq.)	Restoration actions that require Section 404 Clean Water Act permits are likely also to require authorization under Section 10 of the RHA. A single joint Federal/state permit usually serves for both in MA and RI. Individual restoration activities will be addressed under the joint Federal/state permit.
Coastal Zone Management Act (CZMA, 16 U.S.C. §1451 et seq., 15 C.F.R. 923)	Depending on the state in which projects are being implemented, regulatory authorization for the implementation of restoration projects will be required from the Massachusetts Office of Coastal Zone Management (MACZM), which serves as the lead agency for implementing the State's coastal program, or the Rhode Island Coastal Resources Management Council (CRMC). A MACZM or CRMC approval will be required and obtained for proposed projects; and general concurrence from the State will be secured that the preferred restoration alternative(s) are consistent, to the maximum extent practicable, with the enforceable policies of the State's coastal program.
Endangered Species Act (ESA, 16 U.S.C. §1531 et seq., 50 C.F.R. Parts 17, 222, 224)	Coordination with the USFWS and respective state Natural Heritage Programs and/or the National Marine Fisheries Service (NMFS) have been or will be completed during the planning or design phase of each restoration project and prior to implementation. If a listed species may be potentially affected, further consultation with USFWS or NMFS will be required, in accordance with Section 7 of the Endangered Species Act.

Federal Statutes, Regulations, and Policies	Compliance
Estuaries Protection Act (16 U.S.C. §§1221-1226)	The proposed restoration projects will enhance benefits to estuarine resources such as estuarine, marine and diadromous fish species, bivalves and other macro-invertebrates, wading and shore birds, waterfowl, and mammals.
Fish and Wildlife Conservation Act (16 U.S.C. §§2901 et seq.)	The proposed restoration projects will enhance benefits to estuarine resources such as estuarine, marine and diadromous fish species, bivalves and other macro-invertebrates, wading and shore birds, waterfowl and mammals.
Fish and Wildlife Coordination Act (FWCA, 16 U.S.C. §661 et seq.)	The preferred restoration projects will have either a positive effect on fish and wildlife resources or no effect.
Watershed Protection and Flood Prevention Act as amended (16 U.S.C. §1001 et seq.)	No significant adverse floodplain impacts are anticipated with any of the preferred projects.
Stevens Fishery Conservation and Management Act, as amended and reauthorized by the Sustainable Fisheries Act (Public Law 104-297) (Magnuson-Stevens Act) (16 U.S.C. §§1801 et seq.)	Projects are only expected to have a beneficial effect on EFH resources.
Marine Mammal Protection Act (16 U.S.C. §§1361 et seq.)	Negligible interaction with marine mammals in the vicinity of the proposed restoration projects is expected. Any potential impacts would be evaluated by NMFS before project implementation would commence.
Migratory Bird Conservation Act (126 U.S.C. §§715 et seq.)	During the project planning phase and prior to implementation, consultation with the USFWS will occur to comply with this Act.
Archeological Resources Protection Act (16 U.S.C. §470 et seq.)	No impacts to archeological resources are anticipated for the proposed projects.
Information Quality Guidelines issued pursuant to Public Law 106-554	This Draft RP is an information product covered by information quality guidelines established by NOAA and DOI for this purpose. The quality of the information contained herein is consistent with the applicable agency policy and guidelines.

Federal Statutes, Regulations, and Policies	Compliance
Rehabilitation Act, Section 508	USFWS has complied with the agency's web policies, based on the World Wide Web Consortium Web Accessibility Initiative.
Executive Order 11990 (42 FR 26,961) – Protection of Wetlands	USFWS and its cooperating agencies have concluded that the preferred restoration projects will fulfill the goals of this executive order.
Executive Order 12898 – Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations and Executive Order 12948 Amendment to Executive Order 12898	USFWS and its cooperating agencies have identified portions of the Town of Dartmouth, City of New Bedford, and towns of Fairhaven, Wareham, Bourne and Gosnold, Massachusetts and Narragansett, Rhode Island as being within the resource use injury area, and having Environmental Justice Populations. Preferred projects have been located within these municipalities and are expected to benefit Environmental Justice communities.
Executive Order 11514 (35 FR 4247) – Protection and Enhancement of Environmental Quality	USFWS and its cooperating agencies have concluded that the preferred restoration projects will fulfill the goals of this executive order.
Executive Order 13112 (64 FR 6,183) – Invasive Species	The proposed restoration projects are not expected to cause or promote the introduction or spread of invasive species.

5.5. State Statutes, Regulations, and Policies, Massachusetts

State Statutes, Regulations, and Policies
Article 97 of the Commonwealth of Massachusetts Constitution (1972)
Executive Office of Energy and Environmental Affairs (M.G.L. Chapter 21A) and its land acquisition regulations (M.G.L. Chapter 51.00) and policies (1995)
Massachusetts Antiquities Act (M.G.L. Chapter 9, Section 27) and its implementing regulations (950 CMR 70 and 71)
Area of Critical Environmental Concern (M.G.L. Chapter 21A, Section 2(7); 301 CMR 12.00)
Massachusetts Clean Waters Act (M.G.L. 21, Sections 26-53)
Massachusetts Contingency Plan (310 CMR 40.0000)
Massachusetts Oil and Hazardous Material Release Prevention and Response Act (M.G.L. Chapter 21E)
Massachusetts Endangered Species Act, M.G.L. Ch. 131A and its implementing regulations (321 CMR 10.00)
Massachusetts Environmental Policy Act (M.G.L. Chapter 30 §61 et seq.)
Massachusetts Surface Water Quality Standards (314 CMR 4.00)
Public Waterfront Act ("Chapter 91 regulations", M.G.L. Chapter 91)
Wetlands Protection Act (M.G.L. Ch. 131 §40 and Rivers Protection Act, St. 1996, Chapter 258)
Section 401 Water Quality Certification for Discharge of Dredged or Fill Material, Dredging, and Dredged Material Disposal in Waters within the Commonwealth (314 CMR 9.00)
Massachusetts EEA Land Acquisition Policies in accordance with 301 CMR 51.05
Environmental Justice Policy of the Executive Office of Energy and Environmental Affairs

5.6. State Statutes, Regulations, and Policies, Rhode Island

State Statutes, Regulations, and Policies
Rhode Island Coastal Resource Management Program, as amended (replacing Chapters 1 through 5 of the program adopted by the Coastal Resources Management Council, 1977)
Rhode Island Water Quality Regulations (R.I. Gen. Laws Chapter 42-35 pursuant to Chapters 46-12 and 42-17.1 of the Rhode Island General Laws of 1956, as amended)
Rhode Island Freshwater Wetland Act (R.I. Gen. Laws Chapters 2-1-20.1, 42-17.1, and 42-17.6, as amended)
Rhode Island Endangered Species Act. (R.I. Gen. Laws Section 20-37-1)
Rules and Regulations Governing Nuisance Wildlife Control Specialists
State of Rhode Island and Providence Plantations Constitution, Article 1, Section 17
Rhode Island Oil Spill Pollution Prevention and Control Act (R.I. Gen. Laws Section 46-12.5.1-1 et seq.)

5.7. Local Laws

As appropriate, restoration actions will take into account and comply with local ordinances, and to the extent practicable, local and/or regional plans. Relevant local and regional plans may include shoreline and growth management plans. Relevant local ordinances could include but not be limited to zoning, construction, noise limits, and wetlands protection. For example, in Massachusetts, municipal conservation commissions are empowered to administer the Massachusetts Wetlands Protection Act (MWPA, M.G.L. Chapter 131 §40) and may also adopt local bylaws and undertake other activities such as natural resource planning and land acquisition. Projects that are selected by the Trustees through the restoration planning process for implementation will need to have the project lead agency or organization coordinate with local municipalities to address local requirements, and to the extent practicable, be in conformance with any relevant local or regional plans.

5.8. Environmental Justice

Environmental justice (EJ) is federally defined as the equal protection and meaningful involvement of all people with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies and the equitable distribution of environmental benefits. The Federal Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was signed into law by President Clinton on February 11, 1994, calling on each Federal agency to achieve EJ as part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions, the District of Columbia, the Commonwealth of Puerto Rico, and the Commonwealth of the Mariana Islands.

In the context of this RP, a number of EJ communities are located within the areas proposed for restoration that include potential project alternatives in Massachusetts, Rhode Island, New Hampshire, Vermont, and Maine. Potential benefits to EJ populations that are in proximity to the proposed restoration alternatives may include increased wildlife viewing, educational activities, and volunteering opportunities.

The Environmental Protection Agency has developed an online tool that is publicly available, and provides a way to display EJ communities and their associated demographic indicators:

EJSCREEN: Environmental Justice Screening and Mapping Tool

6. Literature Cited

Allen, R.B., D.G. McAuley and A. Tur. 2008. Survival, nest success and productivity of female common eiders (*Somateria mollissima dresseri*) on Flag Island, Harspwell, Casco Bay, Maine. Final Report 2003-2008.

Anderson, D.W., F. Gress and D.M. Fry. 1996. Survival and dispersal of oiled brown pelicans after rehabilitation and release. Marine Pollution Bulletin. 32(10):711-718.

Augspurger, T., J.C. Franson, K.A. Converse, P.R. Spitzer and E.A. Miller. 1998. An epizootic of common loons in coastal waters of North Carolina: Concentrations of elemental contaminants and results of necropsies. Environmental Toxicology and Chemistry: An International Journal, 17(2):205-209.

Bentzen, R. and M.D. Robards. 2014. Review of Seabird Bycatch in Set-Gillnets with Specific Reference to Mitigating Impacts to Yellow-billed Loons. Wildlife Conservation Society. August 2014.

Biodiversity Research Institute (BRI). 2018. Loon Translocation: A Summary of Methods and Strategies for the Translocation of Common Loons. September 2018.

California Department of Fish and Game (CDFG), California State Lands Commission, United States Fish and Wildlife Service. June 2007. Stuyvesant/Humboldt Coast Oil Spill. Final Damage Assessment and Restoration Plan/Environmental Assessment.

CDFG California State Lands Commission, National Oceanic and Atmospheric Administration, United States Fish and Wildlife Service, National Park Service, Bureau of Land Management. February 2012. *Cosco Busan* Final Damage Assessment and Restoration Plan/Environmental Assessment.

Cooke, F., M.A. Bousfield and A. Sadura. 1981. Mate change and reproductive success in the lesser snow goose. Condor. 83:322-327.

Daoust, P-Y., G. Conboy, S. McBurney and N. Burgess. 1998. Interactive mortality factors in common loons from maritime Canada. Journal of Wildlife Diseases 34:524–531.

DeSorbo, C. R., K. M. Taylor, D. E. Kramar, J. Fair, J. H. Cooley, Jr., D. C. Evers, W. Hanson, H. S. Vogel and J. L. Atwood. 2007. Reproductive advantages for common loons using rafts. Journal of Wildlife Management. 71(4):1206-1213.

Doty, H.A. 1983. Canvasback introduction in west-central Minnesota. Prairie Naturalist. 15(1):23-28.

eBird. 2019. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: http://www.ebird.org. (Accessed: January 2019)

Evers, D.C. 2001. Common Loon population studies: continental mercury patterns and breeding territory philopatry. PhD dissertation. University of Minnesota, St. Paul, Minnesota.

Evers, D.C. 2007. Status assessment and conservation plan for the Common Loon (*Gavia immer*) in North America. BRI Report 2007-20. U.S. Fish and Wildlife Service, Hadley, Massachusetts.

Evers, D., S. Gallo, E. Hanson, M. Pokras, N. Schoch and H. Vogel. 2009. A Proposal to Restore Common Loon Losses Resulting from the Bouchard Barge 120 Oil Spill. Northeast Loon Study Working Group. June 14, 2009.

Evers, D.C., J.D. Paruk, J.W. McIntyre and J.F. Barr (2010). Common Loon (*Gavia immer*), version 2.0. In The Birds of North America (A. F. Poole, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bna.313.

Evers, D.C., L. Savoy, M. Kneeland, K. Taylor, V. Spagnuolo and A. Dalton. 2018. Restore the Call: Massachusetts Status Report for the Common Loon. Biodiversity Research Institute, Portland, Maine. Science Communications Series BRI2018-35. 8p.

Evers, D.C. and K.M. Taylor. 2014. Journey with the Loon. Willow Creek Press, Inc. Minocqua, Wisconsin. 143 pp.

Evers, D.C., M. Sperduto, C.E. Gray, J.D. Paruk and K. M. Taylor. 2019. Restoration of Common Loons following the North Cape Oil Spill, Rhode Island, USA. Science of the Total Environment. 695.

Fiorello, C., P. Jodice, J. Lamb, Y. Satge, K. Mills-Parker, D. Jaques, L. Henkel, R. Golightly and M. Ziccardi. 2017. Post-Release Monitoring of Oiled Brown Pelicans from the 2015 Refugio Oil Spill. In International Oil Spill Conference Proceedings (Vol. 2017, No. 1, pp. 605-617). International Oil Spill Conference. May 2017.

Forrester, D.J., W.R. Davidson, R.E. Lange, Jr, R.K. Stroud, L.L. Alexander, J.C. Franson, S.D. Haseltine, R.C. Littell and S.A. Nesbitt. 1997. Winter mortality of common loons in Florida coastal waters. Journal of Wildlife Diseases. 33:833–847.

Forsell, D. J. 1999. Mortality of migratory waterbirds in Mid-Atlantic Coastal anchored gillnets during March and April 1998. U.S. Fish and Wildlife Service, Chesapeake Bay Field Office. Annapolis, Maryland.

Gallo, S., E. Stancioff, B. Bisson and S. Randall. 2017. The State of Maine's Loons. Maine Sea Grant Publications. 148. https://digitalcommons.library.umaine.edu/seagrant_pub/148.

Goudie, R.I., G.J. Robertson and A. Reed. 2000. Common Eider (*Somateria mollissima*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/546.

Grade, T.J., M.A. Pokras, E.M. Laflamme and H.S. Vogel. 2018. Population-level effects of lead fishing tackle on common loons. The Journal of Wildlife Management. 82(1):155-164.

Grear, J.S., M.W. Meyer, J.H. Cooley Jr, A. Kuhn, W.H. Piper, M.G. Mitro, H.S. Vogel, K.M. Taylor, K.P. Kenow, S.M. Craig and D.E. Nacci. 2009. Population growth and demography of common loons in the northern United States. The Journal of Wildlife Management. 73(7):1108-1115.

Griffith, B., J.M. Scott, J.W. Carpenter and C. Reed. 1989. Translocation as a species conservation tool: status and strategy. Science. 245(4917):477-480.

Gummer, H., 2003. Chick translocation as a method of establishing new surface-nesting seabird colonies: a review. Department of Conservation.

Hammond, C.A.H. 2009. Conservation plan for the common loon in Montana. Montana Department of Fish, Wildlife and Parks. Kalispell, Montana. 41 p.

Hampe, A. and R.J. Petit. 2005. Conserving biodiversity under climate change: the rear edge matters. Ecology letters. 8(5):461-467.

Hancock, M. 2000. Artificial floating islands for nesting Black-throated Divers (*Gavia arctica*) in Scotland: construction, use and effect on breeding success. Bird Study. 47:165-175.

Hanson, E. and A. Klem. Undated. Protecting loon nests – Measuring the effectiveness of nest warning sign buoys. Eric Hanson, VLRP Coordinator.

Heusmann, H. and C. Trocki. In review. Expanded common eider (*Somateria mollissima dresseri*) breeding range as the result of transplants.

Hewitt, G.M. 2004. Genetic consequences of climatic oscillations in the Quaternary. Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences. 359(1442):183-195.

Holland, D., E. Gudmundsson and J. Gates. 1999. Do fishing vessel buyback programs work: a survey of the evidence? Marine Policy. 23(1):47-69.

Kelly, L. 1992. The effects of human disturbance on Common Loon productivity in northwestern Montana. MS Thesis, Montana State University, Bozeman, Montana. Online: http://fwp.mt.gov/fishAndWildlife/management/commonLoon/.

Kenow, K.P., P.J. Garrison, T.J. Fox and M.W. Meyer. 2013. Historic Distribution of Common Loons in Wisconsin in Relation to Changes in Lake Characteristics and Surrounding Land Use. Potential Effects of Climate Change on Inland Glacial Lakes and Implications for Lake Dependent Biota in Wisconsin. 89 pp.

Lee, D.E., C. Abraham, P.M. Warzybok, R.W. Bradley and W.J. Sydeman. 2008. Common murre (*Uria aalge*) age-specific survival, breeding success, and recruitment in the California Current System. Auk 125:316-325.

Loon Preservation Committee (LPC). 2011. The New Hampshire Common Loon Recovery Plan. Draft 3. February 2011.

LPC. 2018. Loon Preservation Committee Recommendations for B-120 Draft Restoration Plan. December 20, 2018.

Maine Audubon. Undated. Loon protection. Online: http://maineaudubon.org/wp-content/uploads/2011/10/Loon-Protection.pdf.

Martell, M.S., J.V. Englund and H.B. Tordoff. 2002. An urban Osprey population established by translocation. J Raptor Research. 36(2):91-96.

Massachusetts Executive Office of Energy and Environmental Affairs (MA-EEA), Department of Fish and Game, Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program. 2016. Press release.

MA-EEA, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration, Rhode Island Department of Environmental Management and ENTRIX, Inc. 2005. Bouchard Barge No. 120 Oil Spill, Buzzards Bay, Massachusetts. Pre-assessment Data Report. 66 pp. + appendices.

Massachusetts Division of Fisheries and Wildlife (MassWildlife). 2015. Massachusetts State Wildlife Action Plan 2015. Westborough, Massachusetts.

Mawhinney, K., A.W. Diamond, P. Kehoe and N. Benjamin. 1999. Status and productivity of common eiders in relation to great black-backed gulls and herring gulls in the southern Bay of Fundy and the northern Gulf of Maine. Waterbirds. 22(2):253-262.

Mazet, J.A., S.H. Newman, K.V. Gilardi, F.S. Tseng, J.B. Holcomb, D.A. Jessup and M.H. Ziccardi. 2002. Advances in oiled bird emergency medicine and management. Journal of Avian Medicine and Surgery. 16(2):146-150.

Merrie, T.D.H. 1996. Breeding success of raft-nesting divers in Scotland. British Birds. 89:306-307.

Milne, H. and A. Reed. 1974. Annual production of fledged young from the eider colonies of the St. Lawrence estuary. Canadian Field Naturalist. 88:163-169.

Mitro, M.G., D.C. Evers, M.W. Meyer and W.H. Piper. 2008. Common loon survival rates and mercury in New England and Wisconsin. J. Wildlife Management 72(3):665-673.

National Oceanic and Atmospheric Administration (NOAA), United States Fish and Wildlife Service, Massachusetts Executive Office of Energy and Environmental Affairs and Rhode Island Department of Environmental Management. 2014. Final Programmatic Restoration Plan and Environmental Assessment for the Buzzards Bay Bouchard Barge-120 (B-120) Oil Spill Shoreline, Aquatic, and Natural Resource Use Injuries Massachusetts and Rhode Island. September 2014.

NOAA, Rhode Island Department of Environmental Management, United States Department of Interior and United States Fish and Wildlife Service. 1999. Restoration and Environmental Assessment for the January 19, 1996 North Cape Oil Spill. March 31, 1999.

Open Ocean Trustee Implementation Group. 2018. Draft Restoration Plan 1 and Environmental Assessment: Birds and Sturgeon. Gulf Spill Restoration. October 2018.

Parsons, K.C. and E. Jedrey. 2013. Boston Harbor Islands National Park Area: Coastal Waterbird Management Recommendations. Massachusetts Audubon. Final Report. January 2, 2013.

Paton, P.C.W., R.J. Harris and C.L. Trocki. 2005. Distribution and abundance of breeding birds in Boston Harbor. Northeast Naturalist. 12:145–168.

Petit, R.J., I. Aguinagalde, J.L. de Beaulieu, C. Bittkau, S. Brewer, R. Cheddadi, R. Ennos, S. Fineschi, D. Grivet, M. Lascoux and A. Mohanty. 2003. Glacial refugia: hotspots but not melting pots of genetic diversity. Science. 300(5625):1563-1565.

Piper W.H., K.B. Tischler and M. Klich. 2000. Territory acquisition in loons: the importance of the take-over. Animal Behavior. 59:385-395.

Rehm, E.M., P. Olivas, J. Stroud and K.J. Feeley. 2015. Losing your edge: climate change and the conservation value of range-edge populations. Ecology and Evolution. 5(19):4315-4326.

Richman, S. E., E. Varennes, J. Bonadelli and M. Guillemette. 2013. Sea duck predation on mussel farms: a growing conflict. Department of Natural Resources Science, University of Rhode Island. Kingston, Rhode Island, 2881.

Savoy, L. and D. Evers. 2019. Massachusetts Common Loon Monitoring Summary Report, 2018 Season. Biodiversity Research Institute. January 15, 2019.

Sea Turtle Restoration Project (STRP). 2011. California's gillnet fisheries: A problem unsolved. Prepared for the California Fish and Game Commission by the Sea Turtle Restoration Project. October 2001.

Senate Bill Report (SB) 5617. An act relating to banning the use of nontribal gill nets. February 18 2019. Washington.

Senko, J., E.R. White, S.S. Heppell and L.R. Gerber. 2014. Comparing bycatch mitigation strategies for vulnerable marine megafauna. Animal Conservation. 17(1):5-18.

Sidor, I.F., M.A. Pokras, A.R. Major, R.H. Poppenga, K.M. Taylor and R.M. Miconi. 2003. Mortality of common loons in New England, 1987 to 2000. Journal of Wildlife Diseases. 39(2):306-315.

Sorte, C.J., V.E. Davidson, M.C. Franklin, K.M. Benes, M.M. Doellman, R.J. Etter, R.E. Hannigan, J. Lubchenco and B.A. Menge. 2017. Long-term declines in an intertidal foundation species parallel shifts in community composition. Global Change Biology. 23(1):341-352.

Spagnuolo V.A. 2012. A Landscape Assessment of Population Recovery and Habitat of Common Loons in Massachusetts, USA. Thesis. Harvard University. 239 pp.

Spagnuolo V.A. 2014. Landscape Assessment of Habitat and Population Recovery of Common Loons (*Gavia immer*) in Massachusetts, USA. Waterbirds. 37(sp1):125-132.

Sperduto, M.B., S.P. Powers and M. Donlan. 2003. Scaling restoration to achieve quantitative enhancement of loon, seaduck, and other seabird populations. Marine Ecology Progress Series 264:221-232.

Stanton, P.B., 1989. Establishing a breeding eider duck population in Massachusetts. In International Oil Spill Conference (Vol. 1989, No. 1, pp. 493-495). American Petroleum Institute. February 1989.

Steinkamp, M., and Atlantic Coast Joint Venture (ACV). 2008. New England/mid-Atlantic coast bird conservation region (BCR 30) implementation plan. Atlantic Coast Joint Venture, Laurel, MD. Online: http://www. acjv.org/BCR_30/BCR30_June_23_2008_final.pdf. 23 March 2009.

USFWS, National Oceanic and Atmospheric Administration, Massachusetts Executive Office of Energy and Environmental Affairs and Rhode Island Department of Environmental Management. Final Restoration Plan and Environmental Assessment for Piping Plover (*Charadrius melodus*) Impacted by the Bouchard Barge 120 Oil Spill Buzzards Bay Massachusetts and Rhode Island. December 2012.

Weimerskirch, H. 1992. Reproductive effort in long-lived birds: age-specific patterns of condition, reproduction and survival in the wandering albatross. Oikos. 64:464-473.

Wooller, R.D., J.S. Bradley, I.J. Skira and D.L. Serventy. 1990. Reproductive success of short-tailed shearwaters *Puffinus tenuirostris* in relation to their age and breeding experience. J. Animal Ecol. 59:11-170.

Žydelis, R., J. Bellebaum, H. Österblom, M. Vetemaa, B. Schirmeister, A. Stipniece, M. Dagys, M. vanEerden and S. Garth. 2009. Bycatch in gillnet fisheries – an overlooked threat to waterbird populations. Biological Conservation. 142:1269–1281.

7. List of Preparers

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Rhode Island Department of Environmental Management

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8. Agencies, Organizations, and Parties Consulted for Information

Adirondack Center for Loon Conservation, Saranac Lake, NY

Biodiversity Research Institute, Portland, ME

Buzzards Bay Coalition, New Bedford, MA

Loon Preservation Committee, Moultonborough, NH

Maine Audubon Society, Falmouth, ME

Maine Department of Inland Fisheries and Wildlife, Augusta, ME

Massachusetts Audubon Society, Dartmouth, MA

Massachusetts Department of Conservation and Recreation, Boston, MA

Massachusetts Division of Fisheries and Wildlife, Westborough, MA

National Park Service, Boston Harbor Islands National Park, Boston, MA

Northeast Loon Study Working Group

NOAA Restoration Center, Gloucester, MA

Rhode Island Department of Environmental Management, Division of Fish and Wildlife, Jamestown, RI

Rhode Island Department of Environmental Management, Office of Planning and Development, Providence, RI

The Trust for Public Land, Montpelier, VT

Tufts University, Grafton, MA

U.S. Fish and Wildlife Service, Migratory Birds Program, Hadley, MA

U.S. Geological Survey, Upper Midwest Environmental Sciences Center, La Crosse, WI

Vermont Center for Ecostudies, White River Junction, VT

9. Appendices

Appendix A:
Trustee Agency Approvals of the Draft Restoration Plan for Common Loon and Other Birds Impacted by the Bouchard Barge 120 (B-120) Oil Spill, Buzzards Bay Massachusetts and Rhode Island

U.S. Department of the Interior
U.S. Fish and Wildlife Service
Approval of the Draft Restoration Plan for Common Loon and Other Birds Impacted by the Bouchard Barge 120 (B-120) Oil Spill, Buzzards Bay Massachusetts and Rhode Island

In accordance with U.S. Department of the Interior (Department) policy regarding documentation for natural resource damage assessment and restoration projects (521 DM 3), the Authorized Official for the Department must demonstrate approval of draft and final restoration plans and their associated National Environmental Policy Act documentation, with concurrence from the Department's Office of the Solicitor.

The Authorized Official for the Bouchard Barge 120 Oil Spill is the Regional Director for the U.S. Fish and Wildlife Service's Northeast Region.

By the signatures below, the Draft Restoration Plan (RP) is hereby approved. This approval does not extend to the Final RP. The Draft RP shall be released for public review and comment for a minimum of 60 days. After consideration of the public comments received, the RP may be revised, with the Final RP to address such comments.

Approved by:

Wendi Weber
Regional Director
Northeast Region
U.S. Fish and Wildlife Service

8/16/19
Date:

Concurred:

Mark Barash
Senior Attorney
Northeast Region
Office of the Solicitor

8/16/2019
Date:

Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
Approval of the Draft Restoration Plan for Common Loon and Other Birds Impacted by the Bouchard Barge 120 (B-120) Oil Spill, Buzzards Bay Massachusetts and Rhode Island

In accordance with Trustee protocol regarding documentation for Natural Resource Damage Assessment and Restoration (NRDAR) projects, the Massachusetts Executive Office of Energy and Environmental Affairs is providing its approval of the Draft Restoration Plan (RP) Common Loons and Other Birds Impacted by the Bouchard Barge 120 (B-120) Oil Spill. This approval does not extend to the Final RP.

The Draft RP shall be released for public review and comment for a minimum of 60 days. After consideration of the public comments received, the RP may be revised, with the Final RP to address such comments.

Approved by:

K. Theoharides

Kathleen Theoharides, Secretary
Natural Resource Trustee for the Commonwealth of Massachusetts

7/11/19

Date:

State of Rhode Island
Rhode Island Department of Environmental Management
Approval of the Draft Restoration Plan for Common Loon and Other Birds Impacted by the Bouchard Barge 120 (B-120) Oil Spill, Buzzards Bay Massachusetts and Rhode Island

In accordance with Trustee protocol regarding documentation for Natural Resource Damage Assessment and Restoration projects, the Rhode Island Department of Environmental Management is providing its approval of the Draft Restoration Plan (RP) for Common Loon and Other Birds Impacted by the Bouchard Barge 120 (B-120) Oil Spill. This approval does not extend to the Final RP.

The Draft RP shall be released for public review and comment for a minimum of 60 days. After consideration of the public comments received, the RP may be revised, with the Final RP to address such comments.

Approved by:

Mary E. Kay

Mary Kay
Natural Resource Trustee for the State of Rhode Island

Date: 8/19/19