BOUCHARD BARGE NO. 120 OIL SPILL
BUZZARDS BAY, MASSACHUSETTS

PRE-ASSESSMENT DATA REPORT

Cooperatively prepared by the Massachusetts Executive Office of Environmental Affairs, United States Fish and Wildlife Service, National Oceanic and Atmospheric Administration, Rhode Island Department of Environmental Management, and ENTRIX, Inc. (on behalf of Bouchard Transportation Company, Inc.)

June 7, 2005

PRE-ASSESSMENT DATA REPORT

Table of Contents

TABLES

LIST OF FIGURES

APPENDICES

Acronyms

B-120 ..... Barge No. 120
B&B ..... B&B Laboratories
BIA ..... Bureau of Indian Affairs
Clean Harbors ..... Clean Harbors Environmental Services, Inc.
ENTRIX ..... ENTRIX, Inc.
EPH ..... Extractable Petroleum Hydrocarbons
Gallagher ..... Gallagher Marine Systems
IRAC ..... Immediate Response Action Completion
JAT ..... Joint Assessment Team
MADEP ..... Massachusetts Department of Environmental Protection
MADMF ..... Massachusetts Division of Marine Fisheries
MADPH ..... Massachusetts Department of Public Health
MADFW ..... Massachusetts Division of Fisheries and Wildlife
NAS ..... National Audubon Society
NOAA ..... National Oceanic and Atmospheric Administration
NRDA ..... Natural Resource Damage Assessment
OPA ..... Oil Pollution Act of 1990
PADR ..... Pre-Assessment Data Report
PAH ..... Polycyclic Aromatic Hydrocarbons
QA/QC ..... Quality Assurance and Quality Control
RIDEM ..... Rhode Island Department of Environmental Management
RP ..... Responsible Party
SCAT ..... Shoreline Clean-up Assessment Team
SSC ..... Scientific Support Coordinator
SHC ..... Saturated Hydrocarbons
TOC ..... Total Organic Carbon
TPH ..... Total Petroleum Hydrocarbons
Trustees ..... Natural Resource Trustees
USCG ..... U.S. Coast Guard
USEPA ..... U.S. Environmental Protection Agency
USFWS ..... U.S. Fish and Wildlife Service
VOA ..... Volatile Organic Analysis
VPH ..... Volatile Petroleum Hydrocarbons
WHG ..... Woods Hole Group Environmental Laboratory

Species List

Beetles

American burying beetle ..... *Nicrophorus americanus*
Northeastern beach tiger beetle ..... *Cicindela dorsalis dorsalis*

Birds

American oystercatcher ..... *Haematopus palliatus*
American black duck ..... *Anas rubripes*
Black scoter ..... *Melanitta nigra*
Bufflehead ..... *Bucephala albeola*
Canada goose ..... *Branta canadensis*
Common eider ..... *Somateria mollissima*
Common loon ..... *Gavia immer*
Common tern ..... *Sterna hirundo*
Cormorant ..... *Phalacrocorax* sp.
Double-crested cormorant ..... *Phalacrocorax auritus*
Dunlin ..... *Calidris alpina*
Northern gannet ..... *Morus bassanus*
Great black-backed gull ..... *Larus marinus*
Great cormorant ..... *Phalacrocorax carbo*
Greater scaup ..... *Aythya marila*
Gull ..... *Larus* sp.
Herring gull ..... *Larus argentatus*
Hooded merganser ..... *Lophodytes cucullatus*
Horned grebe ..... *Podiceps auritus*
Long-tailed duck ..... *Clangula hyemalis*
Mute swan ..... *Cygnus olor*
Piping plover ..... *Charadrius melodus*
Razorbill ..... *Alca torda*
Red-breasted merganser ..... *Mergus serrator*
Red-necked grebe ..... *Podiceps grisegena*
Red-throated loon ..... *Gavia stellata*
Ring-billed gull ..... *Larus delawarensis*
Roseate tern ..... *Sterna dougallii*
Scoter ..... *Melanitta* sp.
Sooty shearwater ..... *Puffinus griseus*
Surf scoter ..... *Melanitta perspicillata*
White-winged scoter ..... *Melanitta fusca*

Willet ..... *Catoptrophorus semipalmatus*
Yellowlegs ..... *Tringa* sp.

Fish/Shellfish/Invertebrates

American lobster ..... *Homarus americanus*
Blue mussel ..... *Mytilus edulis*
Horseshoe crab ..... *Limulus polyphemus*
Oyster ..... *Crassostrea virginica*
Scallop ..... *Argopecten irradians*
Skate ..... *Raja* sp.
Softshell clam ..... *Mya arenaria*
Quahog ..... *Mercenaria mercenaria*

Marine Mammals

Common dolphin ..... *Delphinus delphis*
Common porpoise ..... *Tursiops truncatus*
Gray seal ..... *Halichoerus grypus*
Harbor seal ..... *Phoca vitulina*
Harp seal ..... *Phoca groenlandica*
Long-finned pilot whale ..... *Globicephala melaena*
White-beaked dolphin ..... *Lagenorhynchus albirostris*

Reptiles

Northern diamondback terrapin ..... *Malaclemys terrapin*

Plants

Saltmarsh cordgrass ..... *Spartina alterniflora*

NOTICE

A hard copy of the Bouchard Barge No. 120 Oil Spill Pre-Assessment Data Report will be incorporated into the Administrative Record for this incident, which will be located at the following addresses:

National Oceanic and Atmospheric Administration
Damage Assessment Center
1305 East West Highway
Building 4, Room 10218
Silver Spring, Maryland 20910
Also available online at http://www.darp.noaa.gov/northeast/buzzard/relate.html

Bourne Public Library
Diane Ranney, Assistant Director
Jonathan Bourne Library
Bourne, Massachusetts 02532
(508) 759-0644

New Bedford Public Library
Teresa Coish, Library Director
613 Pleasant Street
New Bedford, Massachusetts 02740-6203
(508) 991-6279

1.0 INTRODUCTION

The following document contains the Pre-Assessment Data Report (PADR) for the Bouchard Barge No. 120 oil spill (the incident) that occurred in Buzzards Bay, Massachusetts on April 27, 2003. The report was cooperatively prepared by the Natural Resource Trustees (Trustees) and ENTRIX, Inc. (ENTRIX), the Responsible Party's (RP) environmental consultant, in support of a Natural Resource Damage Assessment (NRDA) for this incident. All figures and maps in this Report were prepared by ENTRIX under the direction of the Trustees. Additional information regarding the contents of this Report and its intended uses are outlined below.

1.1 BACKGROUND

A major goal of the Oil Pollution Act of 1990 (OPA) is to make the environment and public whole for injuries to natural resources and services that occur as a result of incidents involving a discharge or substantial threat of a discharge of oil. This goal is achieved first by returning the injured natural resources and services to the condition in which they would have existed if the incident had not occurred (known as the "baseline" condition). This may occur through natural recovery and/or human intervention. Second, the interim loss of natural resources and services from the time of the incident until recovery to baseline is compensated through restoration, rehabilitation, replacement, or acquisition of the equivalent resources and/or services. The process through which these restoration goals are accomplished is known as a NRDA.

The first phase of the NRDA process is the pre-assessment phase. The pre-assessment phase is a preliminary fact-finding and screening process used by the Trustees to determine whether a NRDA is necessary and appropriate. The Trustees' decision to pursue a NRDA is based, in part, on consideration of the following factors: the Trustees' legal authority and jurisdiction to pursue a NRDA based on the circumstances of a particular incident; the likelihood that natural resources and/or services under their stewardship have been, or are likely to be, injured; the degree to which response actions are expected to adequately address the injuries; and the existence of feasible restoration actions to address the injuries.

The PADR consists of: a summary of the incident and response efforts; a preliminary identification of the resources potentially at risk; an analysis of potential pathways by which Barge No. 120 (B-120) oil could contaminate or adversely impact natural resources and/or their services; and a summary of the ephemeral and other data collected and analyzed during the pre-assessment phase of the incident. The pre-assessment phase for this incident is concurrent with the initial response activities conducted between April 28 and September 3, 2003.

Information contained in this Report is intended to document NRDA-related activities, including ephemeral data collection, conducted by the Trustees and the RP during the pre-assessment phase and to assist the Trustees in evaluating the need for continuing the NRDA process. If, based upon the pre-assessment screen, the Trustees determine that natural resources and/or their services were injured as a result of the incident and feasible restoration options exist, the NRDA process will be continued. At such time, subsequent assessments will present additional detailed information collected as part of on-going NRDA activities performed after completion of the pre-assessment phase.

1.2 INCIDENT SUMMARY

On the afternoon of April 27, 2003, Barge B-120, owned and operated by the Bouchard Transportation Company (Bouchard), grounded on a shoal soon after entering the western approach to Buzzards Bay from the south. The grounding ruptured the hull of the barge, causing the subsequent release of approximately 22,000 to 98,000 gallons[1] of its No. 6 fuel oil cargo. The actual volume of the spill is unknown, but has been approximated by various investigators using scientific methods that factor in the speed of the vessel at the time of impact, water, temperature, wind and current conditions, etc. The tugboat *Evening Tide* was towing the barge en route from Philadelphia to the Mirant Power Generating Facility in Sandwich, Massachusetts when the release occurred. The exact grounding location has not been confirmed, but it is believed to be in the area of Buoy G1.

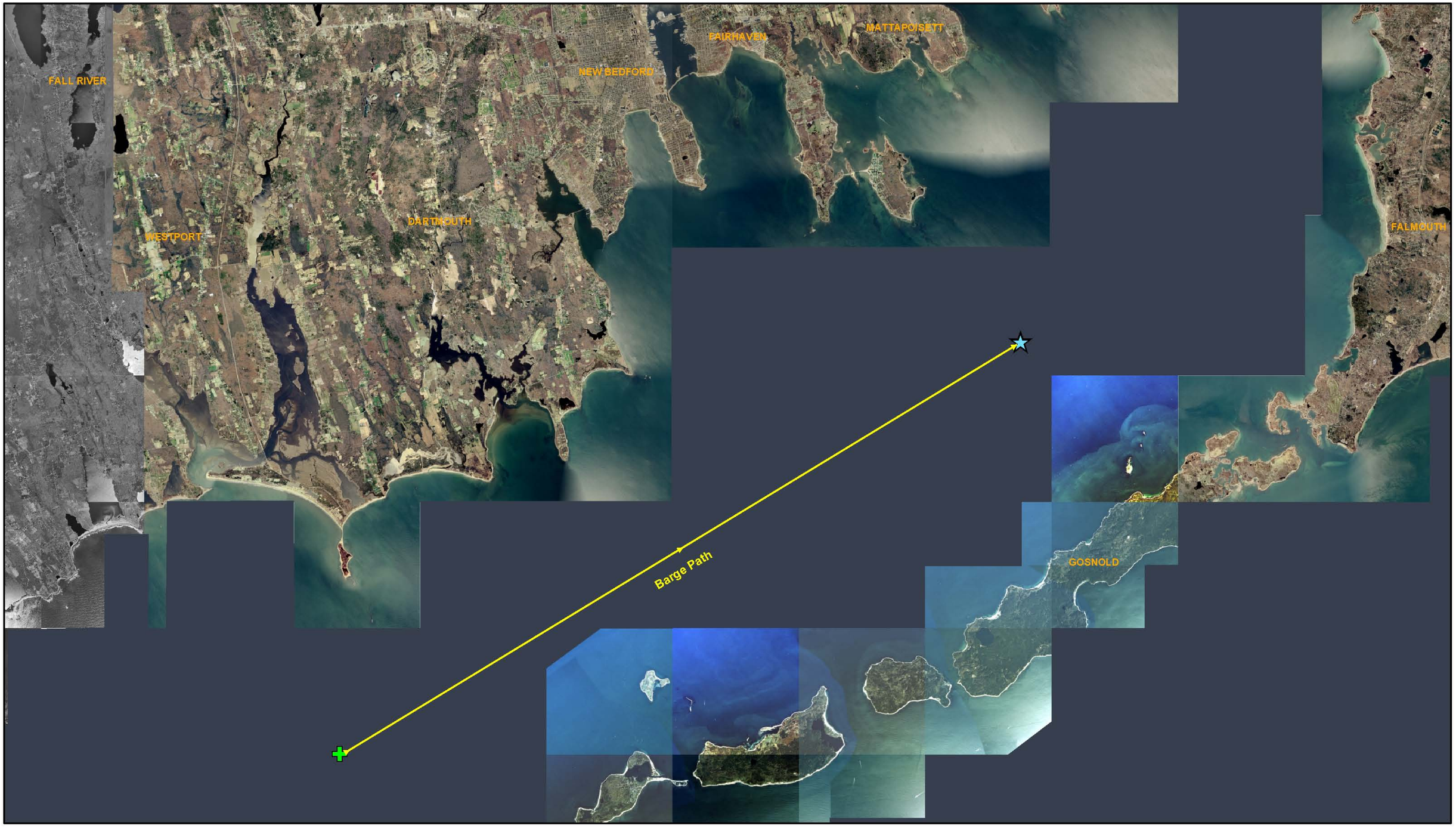
At approximately 5:30 PM local time, Bouchard notified the U.S. Coast Guard (USCG) of the release. The USCG notified state and federal oil spill response authorities and directed the tug and barge to proceed to Buoy 10 (Anchorage Lima) in Buzzards Bay, where it anchored at approximately 6:30 PM. A map of the barge's path to Anchorage Lima and the general area impacted by the incident is provided in Figure 1-1. A 12-foot by 2-foot hole in the No. 2 starboard holding tank of the barge was discovered by divers during an inspection of the hull. After the remaining cargo and oily water was transferred from Barge B-120 to Barge B-10 on April 28, both barges proceeded to the Mirant facility.

In the days following the release, the oil was driven ashore by winds and currents and primarily affected the north, northwest, and northeast portions of the bay including Westport, Dartmouth, New Bedford, Fairhaven, Mattapoisett, Marion, Wareham, Bourne, and Falmouth. Shoreline oiling was unevenly distributed and generally concentrated at exposed points and peninsulas (e.g., Barneys Joy Point, Mishaum Point, West Island, Sconticut Neck and Long Island). In addition, sporadic shoreline oiling was reported on the Elizabeth Islands and in eastern Rhode Island (e.g., Little Compton and Block Island). The shoreline of Buzzards Bay is comprised of a mix of different shoreline types including sand and cobble beaches, rocky shores, tidal wetlands and tidal flats under both public and private ownership. Approximately two-thirds of the oiled shoreline received very light or light oiling, while the other third was moderately to heavily oiled.

On the evening of April 27, 2003, state and federal response agencies arrived on scene. The state and federal agencies responsible for oil spill response and clean-up included the USCG (Federal On-Scene Coordinator), the Massachusetts Department of Environmental Protection ([MADEP] State On-Scene Coordinator), and the National Oceanic and Atmospheric Administration (NOAA). Gallagher Marine Systems, Inc. (Gallagher), the firm retained by the RP to manage the emergency response on its behalf, arrived on scene and began to coordinate boom deployment.

By the morning of April 28, 2003, over 1,500 feet of 16-inch containment boom was deployed around the barge's stern in an attempt to prevent the further release of oil and contain the released material. The clean-up contractors, Clean Harbors Environmental Services, Inc. (Clean Harbors) and Marine Spill Response Corporation, arrived on scene and initiated efforts to recover spilled oil and clean up oiled shorelines. Recovery and clean-up operations included use of skimming boats for on-water recovery, deployment of boom and sorbent material, power washing and various manual clean-up techniques.

[1] *As reported by Independent Marine Consulting, Ltd. (2003) and USGS (2003).*



Legend

- Unconfirmed Grounding Site
- BB10/Anchorage Lima

0 5 10 Miles

N

Figure 1-1
Site Overview
Bouchard B No. 120 Oil Spill
Buzzards Bay, MA

The Unified Command, consisting of the USCG, MADEP, and the RP, was established to direct and oversee clean-up operations. NOAA Hazmat, through the Scientific Support Coordinator (SSC), served in an advisory role to the Unified Command. NRDA pre-assessment activities were coordinated through the State of Massachusetts, the State of Rhode Island, NOAA and the Department of the Interior (acting through the U.S. Fish and Wildlife Service [USFWS]); collectively, the "Trustees."[2] The Trustees and the RP's representative, ENTRIX, coordinated efforts to collect environmental data and samples necessary for the performance of the NRDA for the incident. All NRDA pre-assessment activities were coordinated with the Unified Command to avoid disruption of spill response and clean-up activities.

1.3 ORGANIZATION OF THE PRE-ASSESSMENT DATA REPORT

This PADR summarizes the environmental data collection efforts conducted between April 28, 2003 and September 3, 2003 during the initial response to the incident. This document is organized into three sections. Section 1 provides an introduction to the document. Section 2 describes the initial spill response efforts, including clean-up methodology, Shoreline Clean-up Assessment Team (SCAT) activities, Immediate Response Action Completion (IRAC) inspections, wildlife response, documentation of beach and shellfish closures and advisories, collection of shellfish tissue samples and submerged oil surveys. Section 3 presents a summary of the NRDA pre-assessment efforts, including discussion of the primary resources of concern that were identified, sample collection and survey efforts, and associated analytical results. References are contained in Section 4.

[2] *The Wampanoag Aquinnah Tribe of Gay Head initially participated in the NRDA; however, an independent settlement with the RP was reached and as a result, the Tribe is no longer actively participating in the on-going NRDA.*

2.1 OVERVIEW

This section describes initial response efforts conducted by the RP under the direction of the Unified Command from April 28, 2003 through September 3, 2003. The initial response efforts focused primarily on containment, removal and clean-up of the spilled oil. On-water recovery efforts using skimming boats as well as booms and sorbent material were deployed to contain and recover spilled oil prior to its stranding on the shoreline. Once oil was ashore, shoreline clean-up activities included manual removal of oiled substrate and shoreline debris (e.g., wrack), power-washing, manual wiping, passive collection using sorbent material (e.g., snare) and limited mechanical excavation of heavily oiled substrate. Emergency restoration consisting of re-planting salt marsh vegetation (e.g., *Spartina alterniflora*) was also conducted at several isolated areas during this time. A variety of data was collected during clean-up operations to help document oiled shorelines and prioritize clean-up. Some of these data will also be used for the NRDA. Further information on the initial response activities can be found at the MADEP website for the "Buzzards Bay Bouchard Barge #6 Fuel Oil Spill Shore Impacts."[3]

During the first week, daily overflights were conducted to track the movement of the oil and to direct and prioritize clean-up operations. Overflights also provided an opportunity to document the extent of shoreline oiling and were used in conjunction with ground-based SCAT inspections to determine the extent of shoreline oiling and assess appropriate clean-up techniques for each part of the oiled shoreline. The SCATs were typically composed of representatives from the USCG, MADEP and the RP, with occasional representatives from USFWS, NOAA, Massachusetts Division of Marine Fisheries (MADMF), Clean Harbors, and affected municipalities (or their designated representatives). The specific goals of the SCAT program included the following:

- Document the location, amount and type (e.g., tarballs, patties) of oil on the shoreline;
- Provide the planning and operations sections with accurate shoreline oiling information to aid in clean-up operations; and
- Formulate recommendations for appropriate clean-up methods, priorities and constraints.

Based on SCAT records, approximately 100 of the 300 miles of shoreline within the spill area were determined to be oiled to varying degrees. Of the 100 miles oiled, approximately 85 miles were located in Massachusetts and approximately 15 miles were located in Rhode Island. More than two-thirds of the 100 miles of oiled shoreline were classified as having very light or light oiling, while the other third was moderately to heavily oiled. Figures 2-1 through 2-4 depict the observed maximum extent of shoreline oiling.

[3] *The MADEP website is located online at http://www.mass.gov/dep/bwsc/files/bouchard/bouchard.htm*

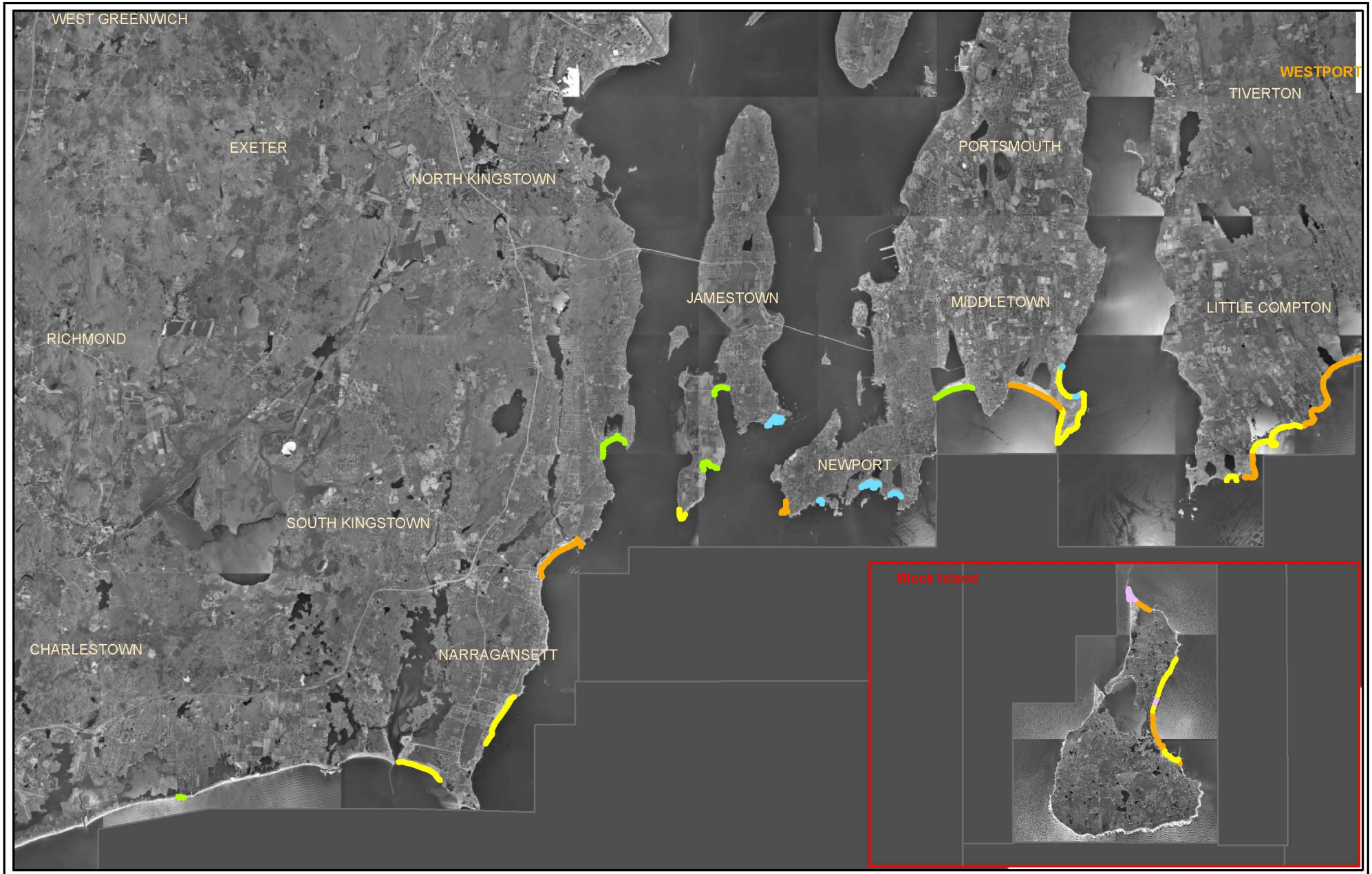


Figure 2-1
Maximum Extent of
Shoreline Oiling
Bouchard B No. 120 Oil Spill
Buzzards Bay, MA

Figure 2-2
Maximum Extent of
Shoreline Oiling
Bouchard B No. 120 Oil Spill
Buzzards Bay, MA

Figure 2-3
Maximum Extent of
Shoreline Oiling
Bouchard B No. 120 Oil Spill
Buzzards Bay, MA

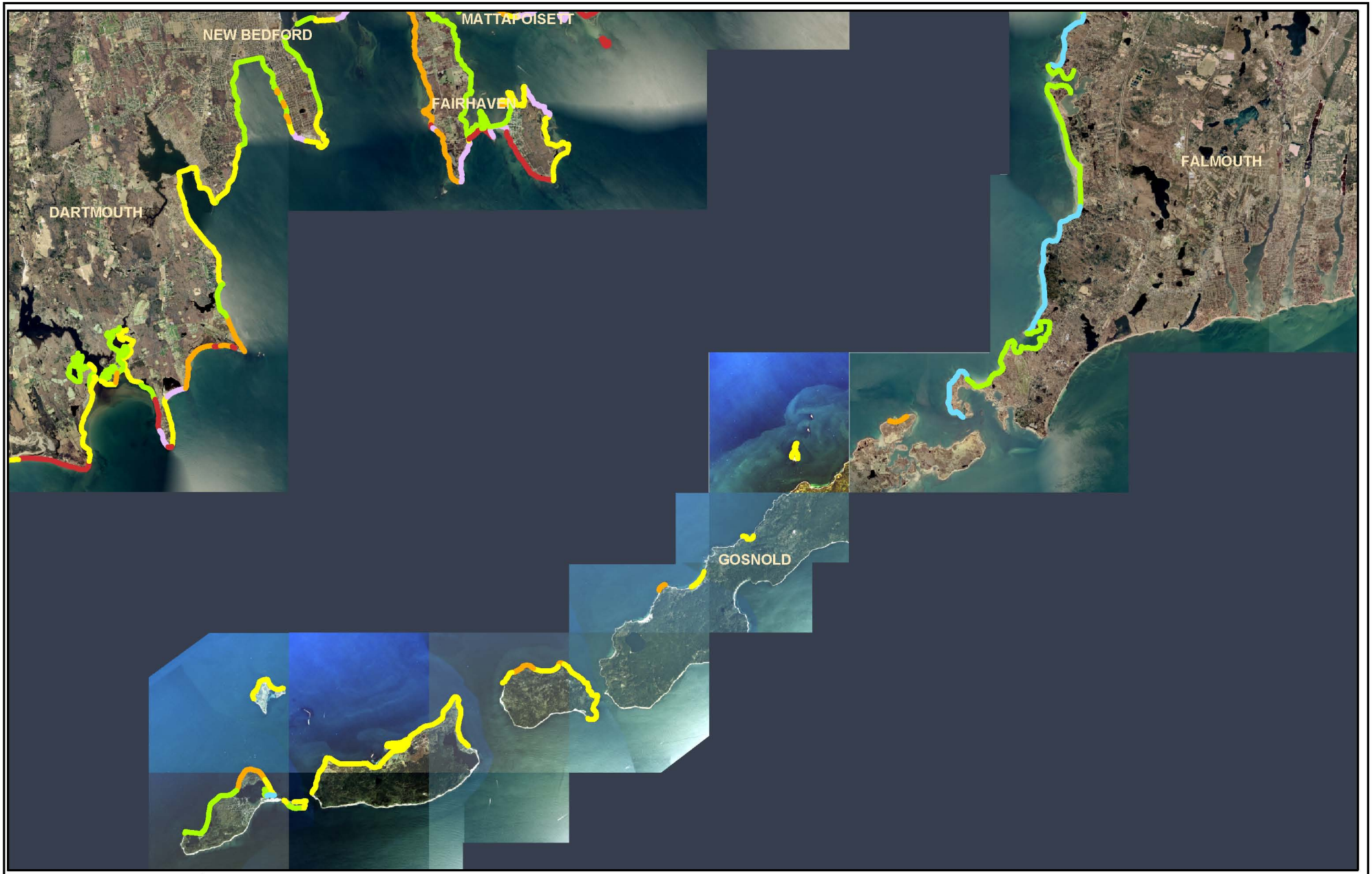


Figure 2-4
Maximum Extent of
Shoreline Oiling
Bouchard B No. 120 Oil Spill
Buzzards Bay, MA

2.2 SUMMARY OF OIL RECOVERY AND CLEAN-UP METHODS

According to USCG reports, approximately 160 personnel were initially involved with clean-up activities during the first few days of the response. The number of personnel increased to a high of approximately 700 by the sixth day of the response. This number included field workers and did not include those specifically involved in operations oversight as part of the Unified Command (USCG, 2003). Additionally, in many towns, municipal oil spill coordinators deployed containment and sorbent boom at sensitive areas (e.g., mouths of waterbodies) in the early stages of the response as a preventative measure.

On-water skimming operations collected approximately 3,500 gallons of oil by the eighth day of the response. During the first week, approximately 8,500 feet of containment boom and 100,000 feet of snare were deployed to aid in the collection of oil (USCG, 2003).

The primary method for on-water recovery of oil was the use of booms and sorbent material. Clean-up of oiled shorelines was accomplished primarily using manual removal techniques. These methods and other clean-up techniques, the use of which were approved by the Unified Command, are discussed in greater detail in the following sections.

2.2.1 Boom and Sorbent Material

Three types of boom were used during clean-up efforts: containment, sorbent, and snare. Containment boom was used as a physical barrier to prevent the spread of oil and was generally placed around the edge of the free product and the barge in order to prevent further spreading. Sorbent boom and pads were used to absorb spilled oil and were placed along the shoreline to help collect oil that washed ashore. Snare boom (i.e., pom-pom) is composed of strands of oil-absorbent material that are bound together in bundles. These bundles were typically tied to a rope at regular intervals; the rope was then stretched across the impacted area. Snare was used to collect oil along shorelines and from rocks or interstitial spaces in groins and jetties.

2.2.2 Manual Removal

Oiled debris, wrack and stranded surface oil (e.g., mats, patties, and tarballs) were manually removed from the shoreline by clean-up crews using shovels and other hand tools. Hand trowels, rakes and hoes were used to remove hardened oil deposits in cobble beaches and marsh. At Barneys Joy, small tarballs were removed by sifting using pool skimmers and homemade sifting boxes made with window screen or wire-mesh hardware cloth. In a limited number of areas, shoreline rocks were manually wiped and then relocated to the subtidal zone to be further cleaned by tidal action as per the approved Shoreline Cleanup Plans. Shoreline cleanup methods were provided in the Shoreline Cleanup Plans (USCG, 2003).

2.2.3 Power-washing

High pressure, hot water power-washing equipment was used at selected locations to remove oil deposits from man-made structures such as docks, seawalls, riprap or boulder groins and on certain natural hard-surface substrates such as piles of cobbles and large cobbles and/or boulders (e.g., rocks too large to move). Water temperatures were equipment-dependent and ranged from 180-200°F. Both seawater and freshwater were used for power-washing; however, freshwater was preferred since the high-suspended solid load in the seawater tended to clog the equipment causing frequent breakdowns. Sorbent material (e.g., snare and pads) and containment booms were placed immediately down-gradient of work zones to collect oil remobilized by power-washing. Low-pressure ambient water flushing from upgradient of the work zone was sometimes used to direct remobilized oil into the sorbent materials.

2.2.4 Sediment Removal and Replacement

In a few heavily oiled areas, the methods discussed above were not sufficient to achieve the clean-up goal. Therefore, oiled substrate was mechanically removed with heavy equipment and replaced with natural materials of similar shape, color and size distribution. This technique was applied in areas of cobble beach where oil coated the majority of the exposed cobble surface and oil mixed with sand in the interstitial space to form hardened asphalt-like deposits. Sediment replacement was conducted at the southwest side of Long Island Point (~0.67 acres), Howard's Beach/Leisure Shores (~0.062 acres), Brandt Island (~0.33 acres) and Crescent Beach (~0.21 acres). Figure 2-5 depicts locations where sediment removal and replacement was conducted. Prior to initiating work, emergency authorizations/permits were obtained from the U.S. Army Corps of Engineers, MADEP and the local conservation commissions. At each site, pre-construction and post-construction elevation surveys were conducted to ensure that the beaches were graded appropriately. All work was performed under the supervision of the Unified Command.

2.2.5 Revegetation

Emergency restoration was conducted in a few areas of fringing salt marsh where oil deposits had hardened or where foot traffic by response personnel inhibited regrowth of *Spartina alterniflora* (smooth cordgrass). In most of these locations, the marsh surface was characterized by dense, vegetative root mat rather than loose sediments. Oil deposits up to several inches thick were manually removed from the marsh surface by scraping and/or raking using hand tools. The top layer of root mat, including the aboveground portion of the vegetation, was removed in the process of removing the hardened oil deposit. Native vegetation was replanted in these areas using bare-root seedlings of *Spartina alterniflora* obtained from a local nursery. Emergency restoration of marsh vegetation was performed at the southern tip of Long Island in Fairhaven (July 26 through 27, 2003) and at Ram Island in Mattapoisett (July 12 through 13, 2003) to supplement natural recovery/recolonization and to reduce the potential for erosion and habitat loss. Figure 2-5 depicts locations where revegetation was conducted.

Legend

- Replant Areas
- Sediment Excavation/Replacement

0 0.5 1 Miles

N

Figure 2-5
Sediment Excavation/Replacement and Replant Locations
Bouchard B No. 120 Oil Spill
Buzzards Bay, MA

2.3 SUMMARY OF WILDLIFE COLLECTION AND RESPONSE EFFORTS

Within the first few days of the spill, Buzzards Bay emergency responders and residents began collecting live and dead oiled birds in the spill area. It rapidly became apparent that dedicated wildlife response efforts were necessary. Local veterinary personnel from Buttonwood Park Zoo in New Bedford initially treated live birds at the zoo prior to the establishment of a treatment center. Tri-State Bird Rescue and Response, Inc. arrived on scene on April 28, 2003 and started coordinating bird collection and rehabilitation efforts. A bird rehabilitation and treatment center was established on April 30, 2003 at the New Bedford wastewater treatment facility. On this same day, USFWS Law Enforcement Agents began cataloging the bird carcasses, which were brought to the wastewater treatment facility. A large number of citizen volunteers provided an essential workforce to support the various activities of the rehabilitation center, such as, but not limited to, animal husbandry, bird washing, construction of animal enclosures, administrative support, and general runner activities (e.g., picking up supplies).

2.3.1 Collection

Coordinated wildlife reconnaissance and collection of oiled animals began on April 30, 2003. These efforts were conducted daily through May 16, 2003. Less frequent efforts occurred between May 17 and June 6, 2003. Search teams consisted of representatives from USFWS, Massachusetts Division of Fisheries and Wildlife (MADFW), ENTRIX, and a large number of volunteers. These teams collected dead oiled and un-oiled carcasses. Periodically, municipal animal control officers participated in or conducted independent wildlife recovery efforts.

Two hotline numbers were established to allow citizens to report observations of oiled wildlife. Using the call-in information, as well as reports from SCAT and wildlife collection teams, live-bird recovery teams were deployed to capture oiled birds wherever possible. If successfully captured, live oiled birds were brought to the rehabilitation center for treatment. Live bird recovery teams primarily consisted of citizens with previous experience in capturing and handling wildlife. These teams received additional guidance from Tri-State Bird Rescue and Response, Inc., on live bird capture, handling, and transport and associated personal safety.

Wetlands, islands, and estuarine areas that could not be easily accessed or searched by foot were accessed and searched by boat.

All live bird recovery and dead bird collection teams received training regarding general personal safety in the field, oil exposure hazards, and oil exposure reduction techniques.

2.3.2 Response Activities Specific to Terns

Ram Island, a small, uninhabited island in Mattapoisett, provides breeding habitat for the common tern and the 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. Once oil began to come ashore on the island, a variety of hazing techniques were employed in an attempt to prevent common and roseate terns from (1) nesting while oil was still present, (2) resting on oiled rocks, and (3) bathing near oiled shoreline. Hazing was initiated on May 3, 2003 and utilized air cannons, a Phoenix Wailer, a Breco, and manual hazing techniques. Hazing efforts ended May 30, 2003 after the island was clean enough to significantly reduce the risk of wildlife

oiling. Some birds were observed nesting during the hazing efforts and additional birds were observed nesting after hazing efforts ended.

In addition to hazing, artificial nesting structures were positioned on Bird and Penikese Islands in an attempt to divert terns from Ram Island.

Endangered Species Biologists from the USFWS and the MADFW worked directly with the USCG to manage the hazing activities and to establish shoreline cleanup levels that would be protective for terns.

2.3.3 Response Activities Specific to Piping Plovers

Within the first few days of the spill, oil stranded on beaches that provide nesting habitat to federally protected piping plovers (*Charadrius melodus*). Reports of oiled piping plovers soon followed. The Coast Guard complied with its legal requirement to abide by the federal Endangered Species Act and consulted with the USFWS on ways to minimize the exposure of piping plovers to oil and to protect plovers, their nests, and their eggs/chicks from disturbances caused by cleanup activities. Endangered Species Biologists from the USFWS and MADFW worked directly with the USCG to implement the following activities designed to avoid the "taking" of federally listed plovers:

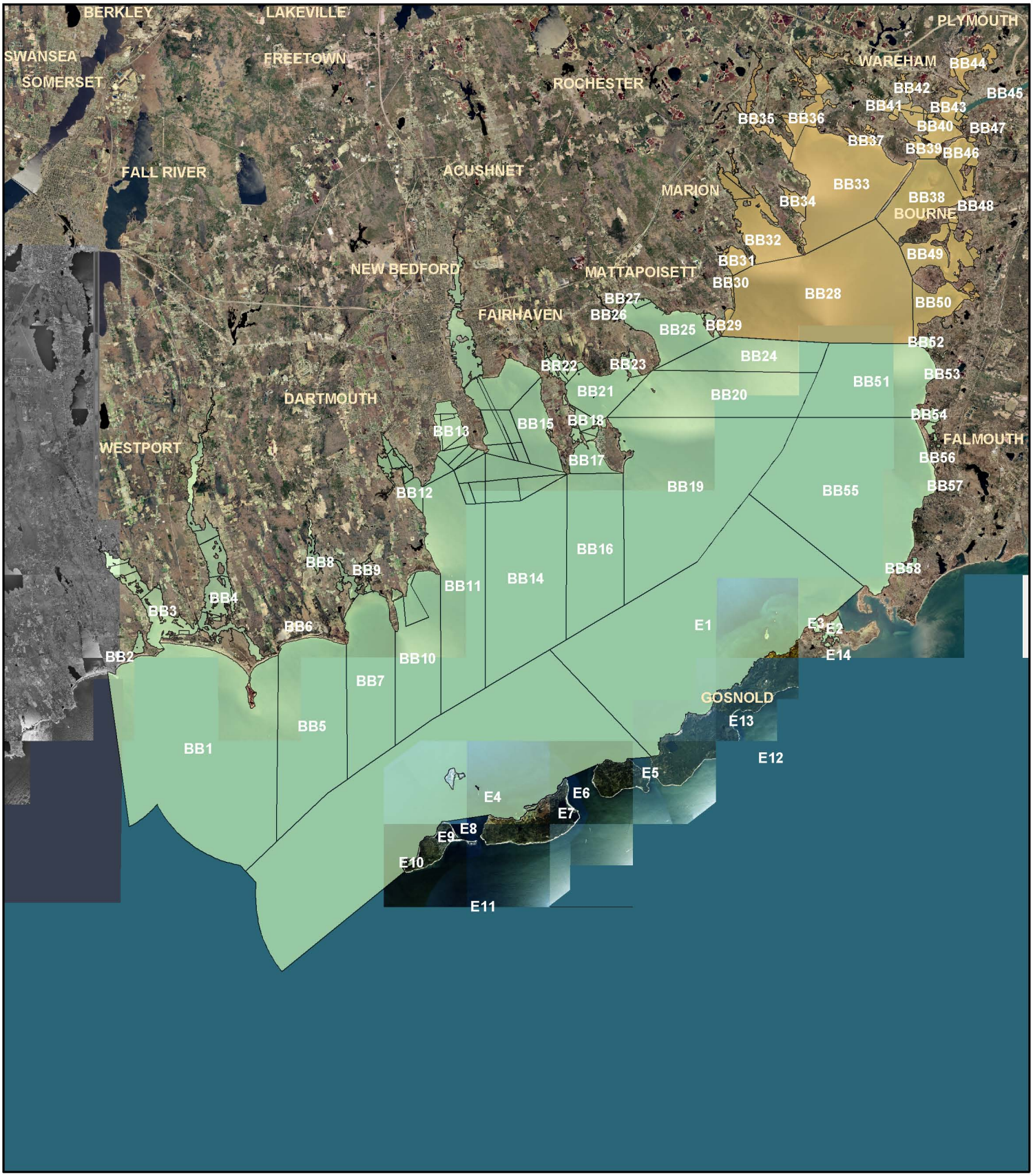
- Establish shoreline cleanup actions and levels for plover beaches that were protective of plovers considering their specific habitat use characteristics;
- Erect symbolic fencing around piping plover habitat to manage response activities within sensitive habitat areas and to prevent or minimize disruption to nesting plovers;
- Restrict the use of motorized vehicles near nesting plovers;
- Monitor piping plovers and establish direct communication between monitors and cleanup site supervisors to avoid or correct plover disturbances; and
- Continuously monitor piping plover chicks at Barneys Joy during cleanup activities to prevent plover chicks from being accidentally injured by cleanup activities.

Representatives for the RP assisted in monitoring plovers and advising response actions that would minimize disturbances caused by cleanup activities.

2.4 SHELLFISH

2.4.1 Shellfish Area Closures and Re-openings

Immediately following the release, the MADMF announced the closure of state shellfish areas BB-1 through BB-58 (within Buzzards Bay) and E-1 through E-14 (adjacent to the Elizabeth Islands). Most acreage (approximately 151,000 acres) was closed on April 28, 2003, with additional acreage (approximately 26,000 acres) closed on April 30, 2003. Acreage is approximate and representative of entire shellfish areas as defined in MADMF announcements. Portions of the 177,000 acres were closed prior to or around the time of the incident for reasons other than the release. Approximately 7,500 acres were already closed due to conditional (e.g., seasonal, poor water quality) or permanent closures. Shellfish area closures are depicted in Figure 2-6.



Legend

- Closed 4/28/2003
- Closed 4/30/2003

0 2.5 5 10 Miles

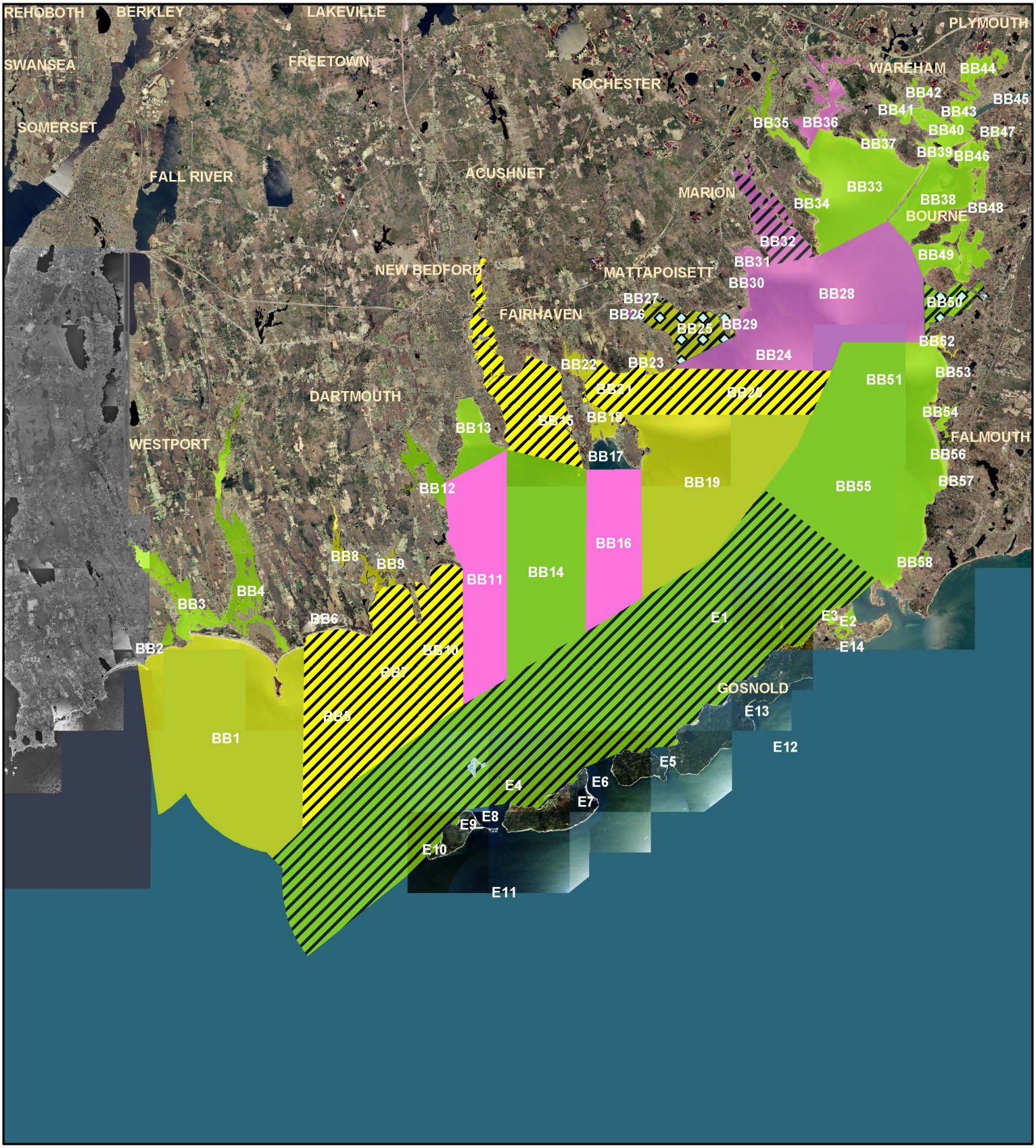
N

Figure 2-6
Shellfish Area Closures
Bouchard B No. 120 Oil Spill
Buzzards Bay, MA

Between May 5 and May 7, 2003, ENTRIX and MADMF collected shellfish samples from selected state shellfish areas within Buzzards Bay for tissue analyses. Sampling locations were chosen by MADMF and Town Shellfish Constables to include areas with heavily and lightly oiled beaches, as well as beaches that appeared un-oiled, based on the results of SCAT surveys.

The Massachusetts Department of Public Health (MADPH) reviewed the results of the initial tissue analyses and made the decision to reopen shellfish areas after discussions with MADMF. After MADPH agreed to the opening of certain shellfish areas, MADMF announced the re-opening of 33 shellfish areas (28 Buzzards Bay areas and five areas adjacent to the Elizabeth Islands) on May 22, 2003, subject to local rules and regulations. This action resulted in opening approximately 91,000 acres of state shellfish areas, or about one-half of the total area closed due to the spill. Shellfish area re-openings are depicted in Figure 2-7.

Subsequent to the May 22 re-opening, MADPH continued to evaluate results of on-going tissue sample analyses as they became available and advised MADMF in the opening of additional shellfish areas. On October 13, 2003, MADMF re-opened approximately 58,000 additional acres of shellfish areas, subject to local rules and regulations. On November 12, 2003, approximately 25,000 acres of additional shellfish areas were opened by MADMF, subject to the local rules and regulations. As of November 12, 2003, one full shellfish area representing approximately 600 acres of state shellfish areas remains closed due to the spill. In addition, 12 partial shellfish areas (acreage unavailable) remain closed due to the spill. The re-opening letters issued by DMF are provided in Appendix A. A chronology of shellfish area closures and openings is summarized in Table 2-1.



Legend

- Full Opening 5/22/2003
- Full Opening 10/13/2003
- Full Opening 11/12/2003
- Partial Opening 5/22/2003
- Partial opening 10/13/2003
- Partial opening 11/12/2003
- Additional Partial Opening 11/12/03

0 1 2 4 Miles

N

Figure 2-7
Shellfish Area Re-openings
Bouchard B No. 120 Oil Spill
Buzzards Bay, MA

Table 2-1. Buzzards Bay Shellfish Area Closures and Openings

Shellfish Area	Location	Status				
		4/28/2003	4/30/2003	5/22/2003	10/13/2003	11/12/2003
BB-1	Westport - South Coastal	closed	closed	closed	open	open
BB-3	West Branch - Westport River	closed	closed	open	open	open
BB-4	East Branch - Westport River	closed	closed	open	open	open
BB-5	Little Beach Coastal	closed	closed	closed	open*	open*
BB-7	Dartmouth - Center Coastal	closed	closed	closed	open*	open*
BB-8	Slocums River	closed	closed	closed	open	open
BB-9	Little River	closed	closed	closed	open	open
BB-10	Smith Neck - South Coastal	closed	closed	closed	open*	open*
BB-11	Dartmouth - East Coastal	closed	closed	closed	closed	open
BB-12	Apponagansett Bay	closed	closed	open	open	open
BB-13	Clark Cove	closed	closed	open	open	open
BB-14	New Bedford - East Coastal	closed	closed	open	open	open
BB-15	New Bedford/Fairhaven Harbor	closed	closed	closed	open*	open**
BB-16	Fairhaven - South Coastal	closed	closed	closed	closed	open
BB-17	West Island South	closed	closed	closed	closed	closed
BB-18	West Island North	closed	closed	closed	open	open
BB-19	West Island - East Coastal	closed	closed	closed	open	open
BB-20	Fairhaven - East Coastal	closed	closed	closed	open*	open*
BB-21	Nasketucket Bay	closed	closed	closed	open*	open**
BB-22	Little Bay	closed	closed	closed	open	open
BB-23	Brandt Island Cove	closed	closed	closed	open	open
BB-24	Mattapoisett South Coastal	closed	closed	closed	closed	open
BB-25	Mattapoisett Harbor	closed	closed	closed	open*	open**
BB-26	Mattapoisett River	closed	closed	closed	closed	open
BB-27	Eel Pond	closed	closed	closed	closed	open
BB-28	North Buzzards Bay	open	closed	closed	closed	open

Table 2-1. Buzzards Bay Shellfish Area Closures and Openings (continued)

Shellfish Area	Location	Status				
		4/28/2003	4/30/2003	5/22/2003	10/13/2003	11/12/2003
BB-29	Point Connett	open	closed	closed	closed	open
BB-30	Hiller Cove	open	closed	closed	closed	open
BB-31	Aucoot Cove	open	closed	closed	closed	open
BB-32	Sippican Harbor	open	closed	closed	closed	open*
BB-33	Stony Point Dike	open	closed	open	open	open
BB-34	Wings Cove	open	closed	open	open	open
BB-35	Weweantic River	open	closed	open	open	open
BB-36	Wareham River	open	closed	closed	closed	open
BB-37	Little Harbor - Bourne Cove	open	closed	open	open	open
BB-38	Wings Neck North	open	closed	open	open	open
BB-39	Widow Cove	open	closed	open	open	open
BB-40	Onset Bay	open	closed	open	open	open
BB-41	Sunset Cove	open	closed	open	open	open
BB-42	East River System	open	closed	open	open	open
BB-43	Fisherman Cove	open	closed	open	open	open
BB-44	Buttermilk Bay	open	closed	open	open	open
BB-46	Phinneys Harbor	open	closed	open	open	open
BB-47	Back River/Eel Pond	open	closed	open	open	open
BB-48	Pocasset River	open	closed	open	open	open
BB-49	Pocasset And Red Brook Harbors	open	closed	open	open	open
BB-50	Megansett Harbor	open	closed	open*	open*	open**
BB-51	North Falmouth - Outer Harbor	closed	closed	open	open	open
BB-52	Wild Harbor - Wild Harbor River	closed	closed	closed	open	open
BB-53	Herring Brook	closed	closed	open	open	open
BB-54	West Falmouth Harbor	closed	closed	open	open	open
BB-55	Falmouth West Coastal	closed	closed	open	open	open
BB-56	Great Sippiwisset Marsh	closed	closed	open	open	open
BB-57	Little Sippiwisset Marsh	closed	closed	open	open	open
BB-58	Quissett Harbor	closed	closed	open	open	open
E-1	Naushon Island West Coastal	closed	closed	open*	open*	open*
E-2	Hadleys Harbor	closed	closed	open	open	open
E-3	Northwest Gutter	closed	closed	open	open	open
E-4	Gosnold West Coastal	closed	closed	open*	open*	open**
E-10	Westend Pond	closed	closed	open	open	open

**A portion of this area was re-opened as defined in the May 22, October 13 and November 10, 2003 re-opening notices; however, some portion still remains closed.*

***An additional portion of this area was re-opened defined in the November 10, 2003 re-opening notice; however, some portion still remains closed.*

2.4.2 Shellfish Tissue Sampling

Between May 5 and October 24, 2003, a total of 151 composite shellfish tissue samples were collected from areas identified within the intertidal and subtidal zones along un-oiled, lightly oiled, and heavily oiled beaches. MADMF representatives identified five species of bivalves targeted for sampling based on their recreational and commercial importance and abundance: blue mussels (*Mytilus edulis*), oysters (*Crassostrea virginica*), quahogs (*Mercenaria mercenaria*), scallops (*Argopecten irradians*) and softshell clams (*Mya arenaria*). Using SCAT maps, MADMF and Town Shellfish Constables selected sampling locations (shellfish beds) located in the vicinity of oiled beaches where recreational shellfishing commonly occurred.

An initial sampling effort was conducted between May 5 and May 7, 2003 followed by five other sample collection efforts (Table 2-2).

Table 2-2. Shellfish Sampling Summary

Sampling Event	Collection Dates	Total Number of Samples	Total Number of Areas Sampled
1	May 5, 2003 to May 7, 2003	49	17
2	May 19, 2003 to May 21, 2003	37	19
3	June 9, 2003 and June 10, 2003	18	10
4	July 8, 2003 to July 10, 2003	28	14
5	August 27, 2003 and August 28, 2003	13	8
6	October 23, 2003 and October 24, 2003	6	4

Composite samples of target species were collected at each location, as available. Three random locations within a shellfish bed were sampled using a clam rake. A total of 12 to 15 specimens of each available species were collected, yielding one composite sample per species at each station. The shells of each specimen were cleared of debris, sediment or visible oil using bay water.

Observations pertaining to the oiled shells and quantity of oiled shells collected were recorded on a data sheet. Photographs were taken of the individual shellfish, along with a display of the shellfish identity, site location, and date and time of sample. Each composite sample was double wrapped in aluminum foil, secured in a labeled, plastic ziploc bag and placed on ice in a field cooler. Samples were shipped to B&B Laboratories (B&B) under proper chain of custody, where the animals were removed from their shells, homogenized and then analyzed for polycyclic aromatic hydrocarbons (PAH). Total PAH refers to the sum of the concentrations of the target PAH (i.e., parent compounds and alkylated homologues) used for fingerprinting identification. (See Appendix E for a list of PAH analytes.) Analytical procedures were conducted in accordance with approved U.S. Environmental Protection Agency (USEPA) and MADEP methodologies. A table summarizing the analytical parameters and methods used by the laboratories is located in Appendix B.

Following laboratory analysis, an assessment of the precision, accuracy, representativeness, completeness and comparability of the samples was conducted to validate the analytical data. Data were validated by ENTRIX using the USEPA Contract Laboratory Program and analytical method specific guidelines (USEPA, 1994). The final validated data and validated data reports for all analytical programs are included in the Administrative Record. Additional information on the Quality Assurance and Quality Control (QA/QC) process is summarized in Appendix C. The Trustees contracted EcoChem, Inc. to conduct an independent review of the QA/QC and validation procedures and conclusions. Their report is included in the Administrative Record.

Total PAH concentrations measured in the shellfish tissue samples are summarized in Tables 2-3 through 2-8 by target species. Concentrations are shown in parts per billion (ppb). Shaded areas of the tables indicate that no sample was collected. Sample locations are depicted in Figures 2-8 through 2-11.

Table 2-3. Results of Total PAH Analyses for Quahog Samples

Site ID	Location	Collection Dates/Total PAH (ppb)					
		May 5 - May 7	May 19 - May 21	June 9 - June 10	July 8 - July 10	August 27 - August 28	October 23 - October 24
APPB-A and B	Apponaganset Beach, Dartmouth	38.4					
BRFF-A and B	Birchfield Farms, Dartmouth	34.4					
COWY-A,B, and C	Cow Yard, Dartmouth	2,241		407	68.8		
MDWI-A,B, and C	Meadow Island in Sippican Harbor	995		66.6			11.5
MDWI-A,B, and C (Dup)	Meadow Island in Sippican Harbor	890					
MHHH-A,B, and C	Mattapoisett Harbor	564		131			
BASS-A,B, and C	Bass Creek, East side of West Island of Nasketucket Bay	3,145			57		
FHHS-A,B, and C	Fairhaven Hacker Street Upper reach of New Bedford/ Fairhaven Bay, not in New Bedford Harbor	8,110			384	173	
FHSB-A, B, and C	Fairhaven Sandy Beach, Northeastern side of Sconticut Neck near Little Bay of Nasketucket Bay	114					
MNHH-A	Mouth of Nakata Creek, Southeast side of Sconticut Neck	7,626			318	138	
CCRS-A,B, and C	Clark's Cove Rogers Street		107				
CCWRF-A,B, and C	Clark's Cove, West Rodney French		150				
NBOHFR-A,B,C,D, and E	New Bedford Outer Harbor, Frederick Street		236		65.3		
BIMT-A,B, and C	Brandt Island, Mattapoisett		1,905	722	105		

Table 2-3. Results of Total PAH Analyses for Quahog Samples (continued)

Site ID	Location	Collection Dates/Total PAH (ppb)					
		May 5 - May 7	May 19 - May 21	June 9 - June 10	July 8 - July 10	August 27 - August 28	October 23 - October 24
BVMA-A,B, and C	Bayview Avenue, Marion		55.7				
GBWP-A,B, and C	East side of Gooseberry Island, Westport		931		34.6		
LHWA-A,B, and C	Little Harbor, Wareham		33.8				
MPDA-A,B, and C	East of Mishaum Point		1,368	378	104		
NEWI-A,B, and C	Northeast side of West Island		532				
NRCV-A,B, and C	North Cove		202				
PCMA-A,B, and C	Near Angelica Point, Mattapoisett		1,020	168			
SHCV-A,B, and C	Shaw's Cove, Fairhaven		842	178			
Swift-A,B, and C	Swift's Beach, Wareham		67.1				
WHBR-A,B, and C	Wild Harbor Basin, Falmouth		1,071	741	252	104	
WRCC-A,B, and C	Wareham River, Crab Cove		42.2				
FTPH-A,B, and C	Fort Phoenix, Fairhaven		1,391		97		
SNNW-A,B, and C	Northwest side of Sconticut Neck near Hacker Street		4,256				
SWLI-A,B, and C	The Southwest side of Long Island in Fairhaven		8,512		2,881	1,175	455
SWLI-A,B, and C (Dup)	The Southwest side of Long Island in Fairhaven		8,228				
WCSN-A,B, and C	West Central side of Sconticut Neck		2,099		96.9		
WFHRS-A,B and C	West Falmouth Harbor[1]	79.6					
LNGB-A and B	Long Beach Point, North side of Long Beach near Indian Neck[1]	64.7					
BRM-A,B and C	Back River Mouth[1]	28.3					
MHRS-A and B	Megansett Harbor[1]	47.0					
RI-A and B	Ram Island, South side of Big Ram Island in Eastern Branch of Westport River[1]	47.2					

[1] *Collected as reference sample*

Table 2-4. Results of Total PAH Analyses for Softshell Clam Samples

Site ID	Location	COLLECTION DATES/TOTAL PAH (PPB)					
		May 5 - May 7	May 19 - May 21	June 9 - June 10	July 8 - July 10	August 27 - August 28	October 23 - October 24
APPB-A and B	Apponaganset Beach, Dartmouth	58.6					
BRFF-A and B	Birchfield Farms, Dartmouth	121					
LNGB-A and B	Long Beach Point, North side of Long Beach near Indian Neck	518		42.7			
FHHS-A,B, and C	Fairhaven Hacker Street Upper reach of New Bedford/ Fairhaven Bay, not in New Bedford Harbor	14,545			818	280	154
MDWI-A,B, and C	Meadow Island in Sippican Harbor	2,513		87			
MEHH-A	Mouth of East Pond in Mattapoisett Harbor	1,309			145		
BASS-A	Bass Creek, East side of West Island of Nasketucket Bay	2,851			70		
FHKB-A,B, and C	Fairhaven Knolmere Beach, Upper reach of Nasketucket	191					
FHSB-A,B, and C	Fairhaven Sandy Beach, Northeastern side of Sconticut Neck near Little Bay of Nasketucket Bay	372			36.5		
MNHH-A	Mouth of Nakata Creek, Southeast side of Sconticut Neck	21,539				257	144
BMB-A,B, and C	Buttermilk Bay		53.2				
FCWA-A,B, and C	Cleveland Ave. in Fisherman's Cove, Wareham		56.9				
LBBW-A,B, and C	Little Bay, Briarwood		64.6				
LBBW-A,B, and C	Little Bay, Briarwood		71.5				
OBWA-A,B, and C	Onset Beach, Wareham		64.5				
RBHI-A,B, and C	Red Brook Handy Point Side of Red Brook Harbor		131				
MOMA-A,B, and C	27 Mooring Road, Marion		257				

Table 2-4. Results of Total PAH Analyses for Softshell Clam Samples (continued)

Site ID	Location	COLLECTION DATES/TOTAL PAH (PPB)					
		May 5 - May 7	May 19 - May 21	June 9 - June 10	July 8 - July 10	August 27 - August 28	October 23 - October 24
NEWI-A,B, and C	Northeast side of West Island		3,416				
SHCV-A,B, and C	Shaw's Cove, Fairhaven		3,458	291	73.6		
Swift-A,B, and C	Swift's Beach, Wareham		533	184			
WNMA-A,B, and C	East of Clapp Island in Wings Cove		152				
SNNW-A,B, and C	Northwest side of Sconticut Neck near Hacker Street		5,765				
WCSN-A,B, and C	West Central side of Sconticut Neck		27,423		191		
EPBR-A,B, and C	Eel Pond Back River[1]	85.0					
WFHRS-A and B	West Falmouth Harbor[1]	107					
Great-A and B	Great Island, Southeastern part of island, Island is in the middle of Eastern Branch of Westport River[1]	104					
MHRS-A,B, and C	Megansett Harbor[1]	100					
MHRS-A,B, and C (Dup)	Megansett Harbor[1]	87.4					

[1] *Collected as reference sample*

Table 2-5. Results of Total PAH Analyses for Oyster Samples

Site ID	Location	COLLECTION DATES/TOTAL PAH (PPB)					
		May 5 - May 7	May 19 - May 21	June 9 - June 10	July 8 - July 10	August 27 - August 28	October 23 - October 24
SLOC-A,B, and C	Slocum	1,093		438	117		
STAR-A and B	Star of the Sea	70.9					
EEHH-N	Eastern mouth of Eel Pond	3,674		812	282	188	121
EEHH-N (Dup)	Eastern mouth of Eel Pond	3,849					
MDWI-A,B, and C	Meadow Island in Sippican Harbor	865		118			
BASS-A,B, and C	Bass Creek, East side of West Island of Nasketucket Bay	2,343			172		
FHHS-A,B, and C	Fairhaven Hacker Street Upper reach of New Bedford/ Fairhaven Bay, not in New Bedford Harbor	11,893			2,189	606	164

Table 2-5. Results of Total PAH Analyses for Oyster Samples (continued)

Site ID	Location	COLLECTION DATES/TOTAL PAH (PPB)					
		May 5 - May 7	May 19 - May 21	June 9 - June 10	July 8 - July 10	August 27 - August 28	October 23 - October 24
FHIN-A,B, and C	Fairhaven Inner Harbor in Nasketucket Bay, north of West Island	1,156		540	324	28.7	
WFHRS-A,B, and C	West Falmouth Harbor, Ref. Site	70.1					
BIMT-A,B, and C	Brandt Island, Mattapoisett		3,799	1,733	297	158	
NRCV-A,B, and C	North Cove		202				
Brook-A and B	Great Island, Northeastern part of Great Island[1]	82.1					
MHRS-A and B	Megansett Harbor[1]	96.8					
PPBR-A,B, and C	Plow Penny Road, Back River[1]	34.0					

[1] *Collected as reference sample*

Table 2-6. Results of Total PAH Analyses for Blue Mussel Samples

Site ID	Location	Collection Dates/Total PAH (ppb)					
		May 5 - May 7	May 19 - May 21	June 9 - June 10	July 8 - July 10	August 27 - August 28	October 23 - October 24
BASS-A,B, and C	Bass Creek, East side of West Island of Nasketucket Bay	4,580			143		
Rt88-A and B	Route 88 Bridge at Westport Point in Westport Harbor[1]	206					

[1] *Collected as reference sample*

Table 2-7. Results of Total PAH Analyses for Bay Scallops Samples

Site ID	Location	Collection Dates/Total PAH (ppb)					
		May 5 - May 7	May 19 - May 21	June 9 - June 10	July 8 - July 10	August 27 - August 28	October 23 - October 24
FHIN-A and B	Fairhaven Inner Harbor in Nasketucket Bay, north of West Island	1,768		930	538	53.6	
MONB-A and B	Mattapoisett Outer Nasketucket Bay, Middle of mouth of Bay	1,865			599	76.7	

Table 2-8. Results of Total PAH Analyses for Surf Clam Samples

Site ID	Location	Collection Dates/Total PAH (ppb)					
		May 5 - May 7	May 19 - May 21	June 9 - June 10	July 8 - July 10	August 27 - August 28	October 23 - October 24
BJB-A	Barneys Joy Beach ¾ mile west	59,625					
BJB-B	Barneys Joy Beach ¾ mile west	114,529					
BJB-A,B, and C	Barneys Joy Beach ¾ mile west				260	48	
Cherry-A and B	Cherry Point, Mouth of Westport Harbor	95.9					
CWBWP-A,B, and C	Cheriann Webb Beach, Westport, approx. 300 ft. offshore		78.6				
CWBWP-A,B, and C (Dup)	Cheriann Webb Beach, Westport, approx. 300 ft. offshore		100				

Legend

- Shellfish Sampling Location
- State-Designated Shellfish Growing Areas

0 1.5 3 6 Miles

N

Figure 2-8
Shellfish Sampling Locations
Bouchard B No. 120 Oil Spill
Buzzards Bay, MA

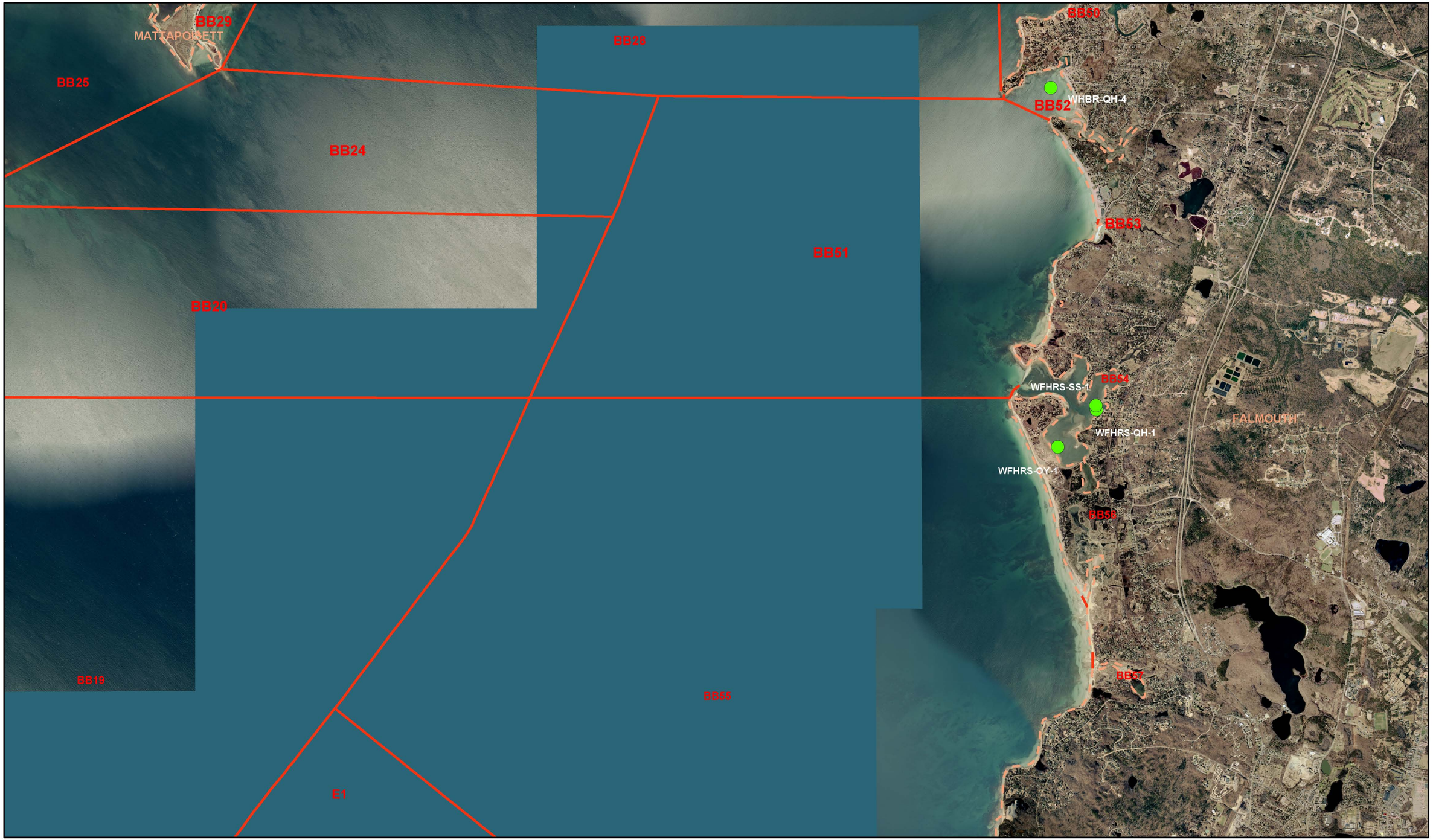
Legend

- Shellfish Sampling Location
- State-Designated Shellfish Growing Areas

0 0.25 0.5 1 Miles

N

Figure 2-9
Shellfish Sampling Locations
Bouchard B No. 120 Oil Spill
Buzzards Bay, MA



Legend

- Shellfish Sampling Location
- State-Designated Shellfish Growing Areas

0 0.5 1 2 Miles

N

Figure 2-10
Shellfish Sampling Locations
Bouchard B No. 120 Oil Spill
Buzzards Bay, MA

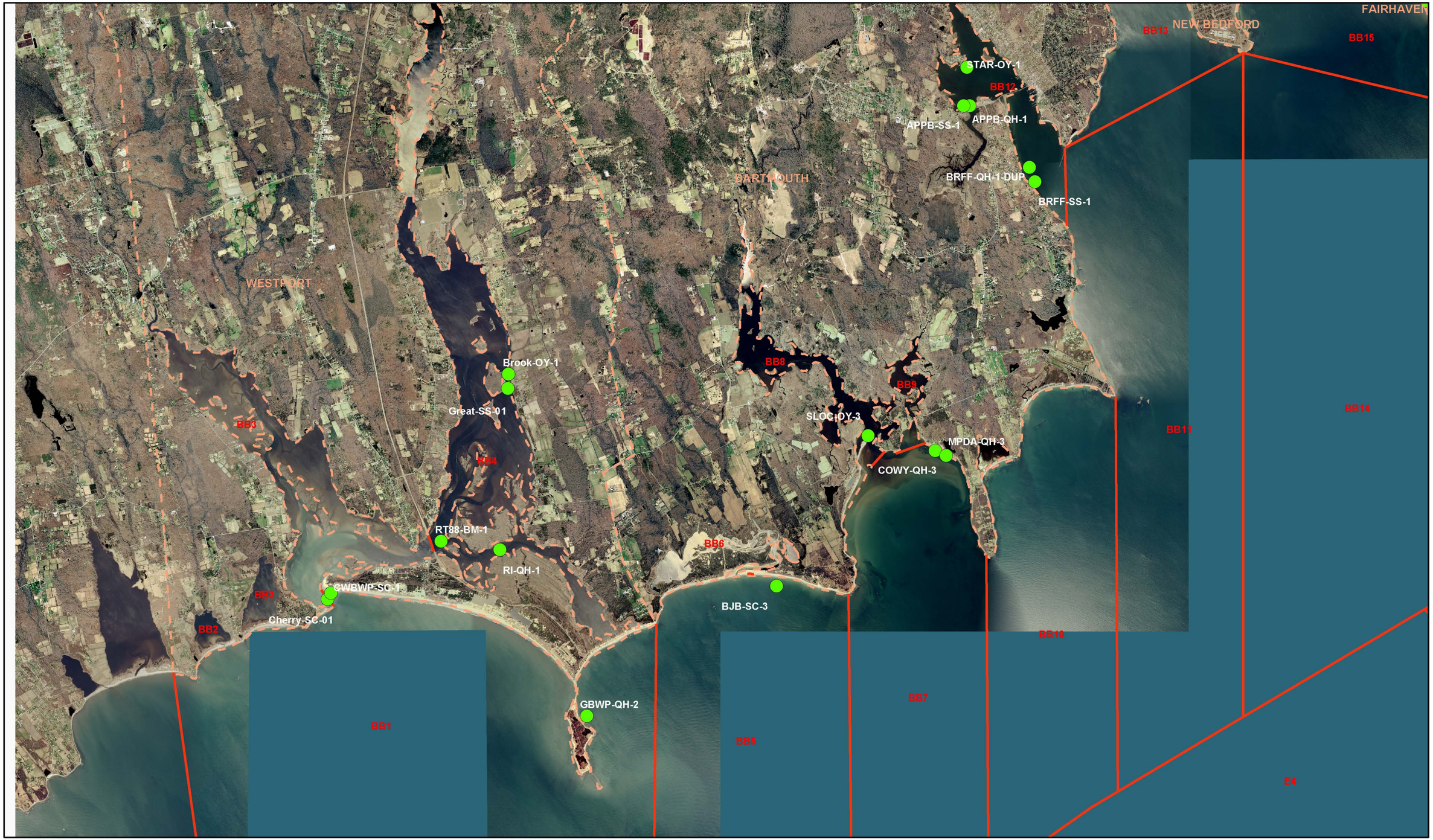


Figure 2-11
Shellfish Sampling Locations
Bouchard B No. 120 Oil Spill
Buzzards Bay, MA

2.5 RECREATIONAL AREAS

There were no documented closures of recreational areas (e.g., beaches) other than shellfish beds in response to the spill. However, some town and state authorities issued advisories against using particular beaches, and residents were discouraged from using beaches near active cleaning operations. During cleanup operations, beach access was restricted at Silver Shell Beach, Planting Island Causeway, Piney Point Beach, and West Island (English, 2004).

2.6 SUBMERGED OIL ASSESSMENT

Periodic re-oiling along some of the heavily oiled shorelines prompted initial efforts to determine whether submerged oil was present offshore. These initial efforts were conducted by the MADMF on May 2 and May 14, 2003. Four lobster traps loaded with sorbent material (e.g., snare) were deployed on the seabed immediately offshore of Barneys Joy Point and north of West Island and left in place for 12 days. Upon retrieval, none of the snare was oiled. The traps were then re-deployed northeast of West Island for seven days. Upon retrieval one of the snares had several spots of oil on it.

Based on the MADMF's preliminary findings, the scope of submerged oil assessments was broadened. A joint team comprised of representatives of NOAA, MADMF, and the RP agreed on the following methods to continue the submerged oil assessment:

- Submerged lobster pots with snare;
- Submerged chain drags; and
- Absorbent pad swipes.

Lobster pot, chain drag and absorbent pad assessments were qualitative in nature. No samples were collected for analysis. The areas initially selected for conducting lobster pot and chain drag surveys were offshore of shorelines that received some of the heaviest oiling. These areas included:

- Barneys Joy Point;
- Northeast of West Island (between West Island and Ram Island); and
- Southwest of West Island (between Wilbur Point and West Island, west of Long Island).

Additional areas that were later selected for lobster pot and chain drag surveys included:

- Demarest Lloyd State Park (northeast of Barneys Joy Point);
- Black Rocks (southwest of Barneys Joy Point); and
- Hen and Chickens Reef.

Absorbent pad surveys were conducted at shellfish sampling locations during the initial sample collection effort. The lobster pot, chain drag and absorbent pad surveys found limited evidence of localized submerged oil. Evidence of oil was only reported at Barneys Joy Point (oil spots on snare in 41 percent of the pots retrieved) and was discovered in minor amounts at a single absorbent pad survey location in Fairhaven (Hacker Street).

In addition to the joint submerged oil assessments, underwater scuba surveys were conducted by the RP at two locations along the path of the barge and four locations where submerged oil was potentially present based on proximity to heavily oiled shorelines, currents and bathymetry (e.g., Barneys Joy Point and West Island). Sediment samples were collected at each scuba survey site and were sent to B&B for potential analysis. No tar balls, oil patties/pancakes or other evidence of spilled oil were observed at any of the survey sites. Additional details pertaining to the various types of submerged oil assessments are provided in the following sections.

2.6.1 Lobster Pot Snare Surveys

Lobster pots containing snare were submerged at each survey location (Figures 2-12 and 2-13). After two to nine days, the traps were recovered and examined for the presence of oil on the pots, snare and buoys. A total of 55 pots were deployed and retrieved between May 30 and June 13, 2003. The lobster pot assessments found little to no submerged oil. Some light staining was observed on the lobster pot snare in the vicinity of Barneys Joy Point (Figure 2-14). Results of the lobster pot snare surveys are summarized in Table 2-9.

Legend

- Clean
- Oiled

0 1 2 Miles

N

Figure 2-12
Lobster Pot Snare
Survey Locations
Bouchard No. 120 Oil Spill
Buzzards Bay, MA

Legend

O Clean

0 0.5 1 Miles

N

Figure 2-13
Lobster Pot Snare
Survey Locations
Bouchard No. 120 Oil Spill
Buzzards Bay, MA

Figure 2-14. Example of Oiled Lobster Pot Snare

Table 2-9. Summary of Lobster Pot Snare Surveys

Area	Dates	Number Pots Retrieved	Number Oiled Pots
Northeast of West Island	5/30/2003	4	0
	6/2/2003	4	0
	6/5/2003	4	0
Southwest of West Island	6/2/2003	4	0
	6/5/2003	3	0
Northeast of Barneys Joy	6/11/2003	3	0
Black Rocks	6/11/2003	3	0
Hen and Chickens Reef	6/11/2003	3	0
Barneys Joy Point	5/30/2003	4	2
	6/2/2003	4	4
	6/5/2003	4	1
	6/11/2003	3	3
	6/13/2003	12	1
Total		**55**	**11**

2.6.2 Chain Drag Surveys

Chains rigged with snare and weights were pulled along the seabed offshore of identified beaches (Figures 2-15 and 2-16). Three or more tows, approximately 100 meters in length each, were conducted at each site. Following each drag, the chain and snare were examined for the presence of oil. Thirty chain drags were conducted between May 30 and June 13, 2003. Little to no oil was observed during the surveys. Some light oil was observed on five of the 17 chain drags near Barneys Joy Point during the first few surveys. Figure 2-17 illustrates evidence of oiled chain drag equipment. Results of the chain drag assessments are summarized in Table 2-10.

Legend

- Clean
- Oiled

0 1 2 Miles

N

Figure 2-15
Chain Drag Survey Locations
Bouchard No. 120 Oil Spill
Buzzards Bay, MA

Legend

- Clean
- Oiled

0 0.5 1 Miles

N

Figure 2-16
Chain Drag Survey Locations
Bouchard No. 120 Oil Spill
Buzzards Bay, MA

Figure 2-17. Oiled Chain Drag Equipment

Table 2-10. Summary of Chain Drag Surveys

Area	Date	Total Number of Chain Drags	Number of Oiled Drags
Northeast of West Island	6/2/2003	3	0
Southwest of West Island	6/2/2003	4	0
Northeast of Barneys Joy	6/5/2003	3	0
Black Rocks	6/5/2003	3	0
Barneys Joy Point	5/30/2003	4	3
	6/2/2003	7	2
	6/5/2003	3	0
	6/11/2003	3	0
Total		**30**	**5**

2.6.3 Absorbent Pad Swipe Surveys

Absorbent pad swipe surveys were conducted between May 5 and June 10, 2003 at shellfish sampling stations during low tide (Figure 2-18). At each intertidal station, absorbent pads were swabbed along the exposed surface of a 20-foot diameter area in the intertidal zone. The presence/absence of oiling on the pads was noted. At subtidal beds, absorbent pads were individually wrapped around the heads of clam rakes and secured with tape. The pad was then submerged and swabbed along the bottom in a 20-foot diameter area. The pad was brought to the surface and observations of oiling were recorded. The used absorbent pads were placed in labeled plastic bags for future reference. Oil was observed on two absorbent pads collected at the Fairhaven Hacker Street and Sconticut Neck shellfish sample locations. No oil was observed on any of the other swipes. A photo documenting evidence of oil on absorbent pads is included in Figure 2-19. Results of the absorbent pad swipe surveys are summarized in Table 2-11.

Legend

- Absorbent Pad Locations
- Oil observed on Pad

0 2.5 5 10 Miles

N

Figure 2-18
Absorbent Pad Survey Locations
Bouchard B No. 120 Oil Spill
Buzzards Bay, MA

Figure 2-19. Spot of Oil on an Absorbent Swipe at Sconticut Neck

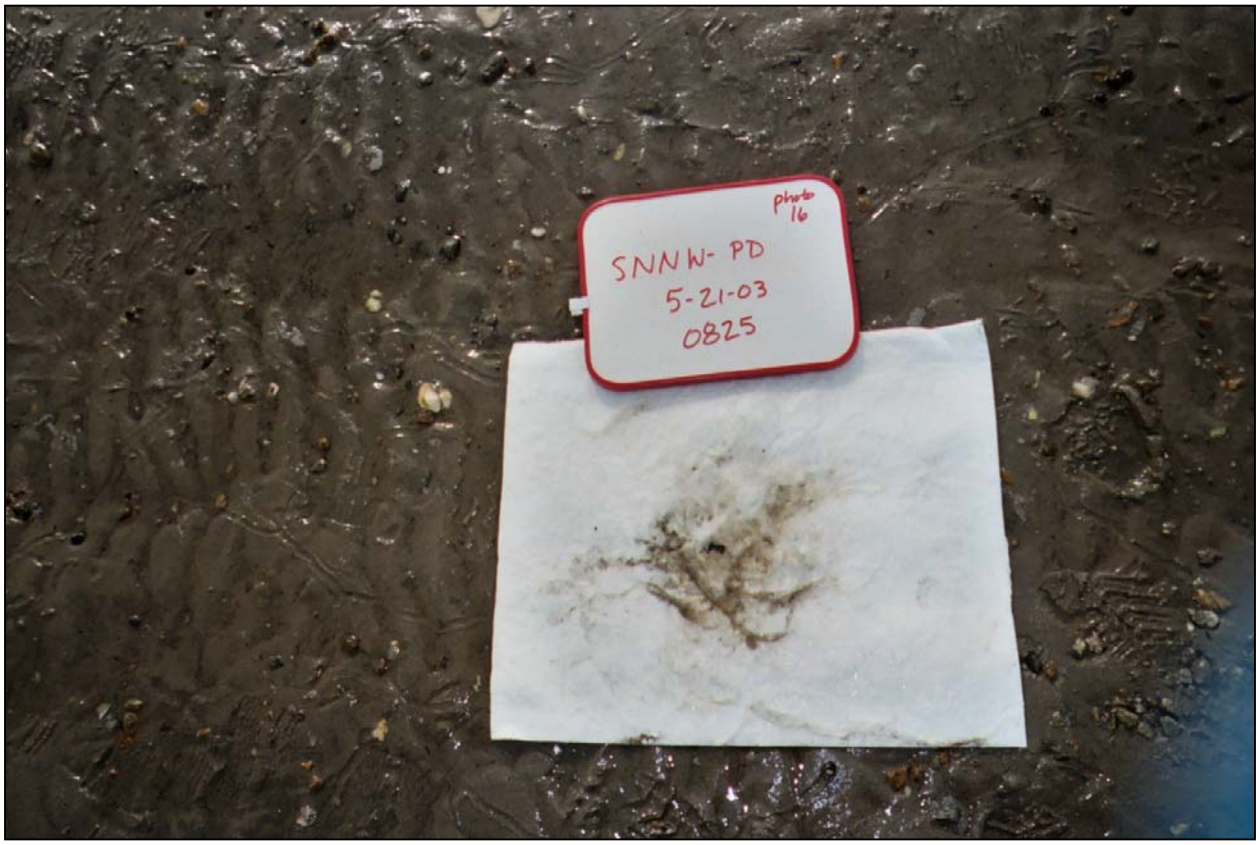


Table 2-11. Summary of Absorbent Pad Swipe Surveys

Location	Date	Comments/Observations
Long Beach Point	5/5/2003	No oil observed
Meadow Island	5/6/2003	No oil observed
Cherry Point	5/6/2003	No oil observed
Ram Island	5/6/2003	No oil observed
Great Island	5/6/2003	No oil observed
Rt. 88 Bridge	5/6/2003	No oil observed
Mattapoisett Harbor	5/6/2003	No oil observed
Eel Pond	5/6/2003	No oil observed
Megansett River & Amarita Island – Reference Site	5/6/2003	No oil observed
Lawrence Island – Reference site	5/6/2003	No oil observed
Megansett Harbor – Reference site	5/6/2003	No oil observed
Back River	5/6/2003	No oil observed
Bass Creek	5/7/2003	No oil observed
Nakata Creek	5/7/2003	No oil observed
West Falmouth Harbor - Reference site	5/7/2003	No oil observed
End of Raymond St, Fairhaven	5/7/2003	No oil observed
Fairhaven, Hacker Street	5/7/2003	Oily spots observed on pad

Table 2-11. Summary of Absorbent Pad Swipe Surveys (continued)

Location	Date	Comments/Observations
Knolmere beach	5/7/2003	No oil observed
Onset Beach	5/19/2003	No oil observed
Fishermans Cove	5/19/2003	No oil observed
Public Beach at 307 W. Rodney Blvd.	5/19/2003	No oil observed
Little Bay - Briarwood Conference Center	5/19/2003	No oil observed
Buttermilk Bay	5/19/2003	No oil observed
Little Harbor	5/19/2003	No oil observed
Wing's Cove	5/19/2003	No oil observed
Angelica Point	5/19/2003	No oil observed
Handy Point	5/19/2003	No oil observed
Wild Harbor Basin	5/20/2003	No oil observed
27 Moorings Rd.	5/20/2003	No oil observed
Brandt Island, Mattapoisett	5/20/2003	No oil observed
Goosebury Island	5/20/2003	No oil observed
Cheriann Webb Beach	5/20/2003	No oil observed
Bayview Ave.	5/20/2003	No oil observed
West Island	5/20/2003	No oil observed
North Cove	5/20/2003	No oil observed
Cow Yard area	5/20/2003	No oil observed
Swift's Beach	5/20/2003	No oil observed
Tempest Knob boat launch	5/20/2003	No oil observed
Sconticut Neck	5/21/2003	Dime-size spot of oil on pad
Fort Phoenix	5/21/2003	No oil observed
Long Island	5/21/2003	No oil observed
West Island Town Beach	5/21/2003	No oil observed
Meadow Island	6/9/2003	No oil observed
Long Beach	6/9/2003	No oil observed
Swifts Beach	6/9/2003	No oil observed
Wild Harbor Basin	6/9/2003	No oil observed
Near Angelica Point, Mattapoisett	6/9/2003	No oil observed
Mishaum Point	6/10/2003	No oil observed
Lloyd Center	6/10/2003	No oil observed
Cow Yard area	6/10/2003	No oil observed
Brandt Island	6/10/2003	No oil observed
Mattapoisett Harbor	6/10/2003	No oil observed
Eel Pond	6/10/2003	No oil observed

2.6.4 Underwater Dive Surveys

Six underwater scuba surveys were conducted between July 31 and August 4, 2003 to determine the presence/absence of submerged oil (Figure 2-20). Ocean Technology Foundation and Aquas, LLC, a contractor hired by the RP, performed the dive surveys. Sediment samples and video recordings were collected at each dive site. Sediment samples were sent to B&B for possible analysis.

No tar balls, oil patties/pancakes or other evidence of spilled oil were observed at any of the dive sites. There was no staining observed on any of the divers' equipment, including gloves and air hoses.[4]

[4] *A final dive survey report is pending.*

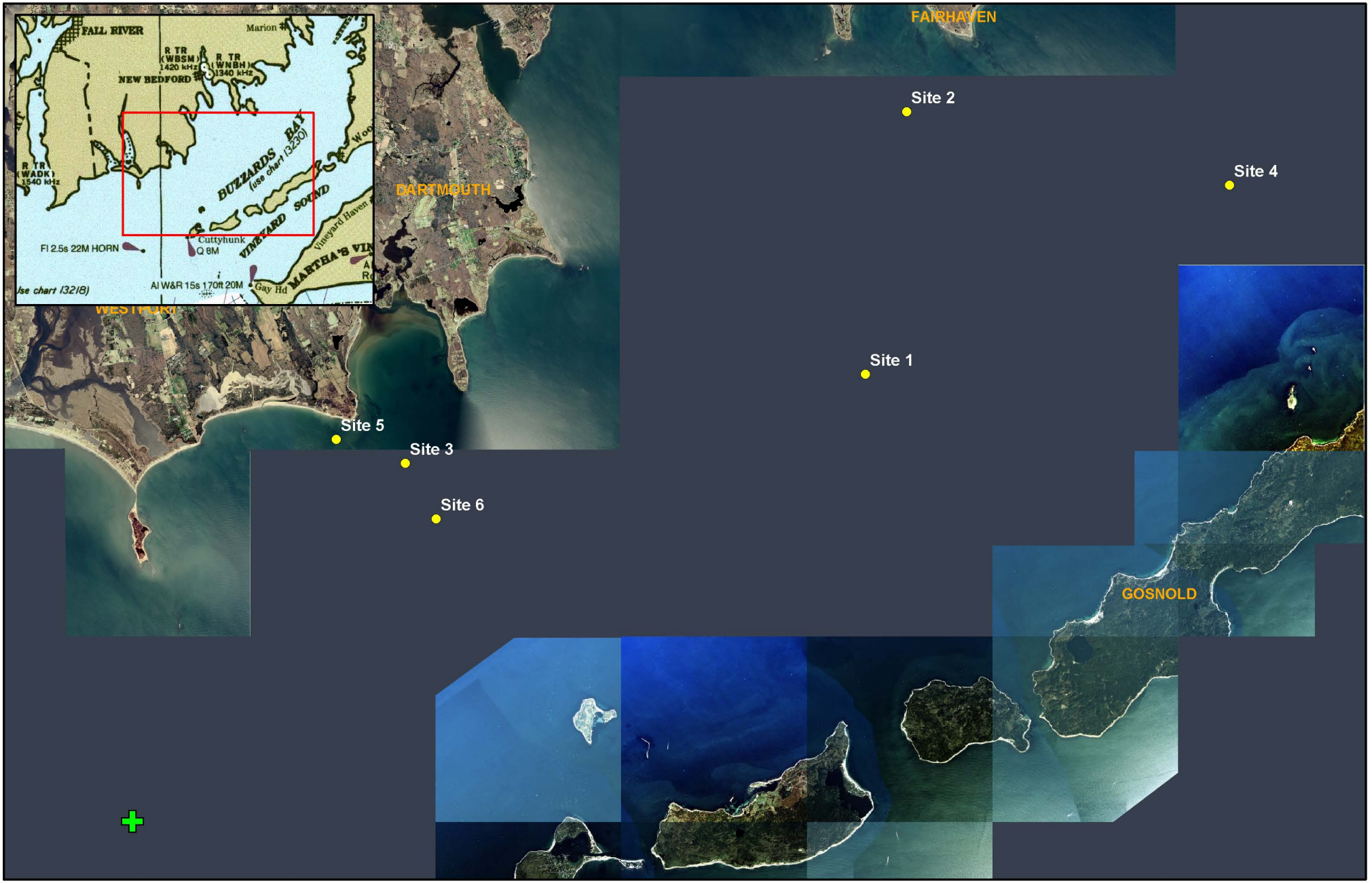


Figure 2-20
Dive Survey Locations
Bouchard No. 120 Oil Spill
Buzzards Bay, MA

2.7 SHORELINE CLEAN-UP COMPLETION CRITERIA

Prior to June 6, 2003, the primary objective of SCAT activities was to provide field reconnaissance in support of on-going clean-up operations. On June 10, 2003, SCAT inspections were replaced by IRAC inspections. The purpose of IRAC inspections was to assess whether individual shoreline segments met the clean-up criteria specified in the Immediate Response Action: Treatment and Completion Guidelines (Appendix D) or if additional actions were required. IRAC criteria were based on visible oiling. Therefore, passing an IRAC inspection does not necessarily equate to "no significant risk" pursuant to the Massachusetts Contingency Plan. Site-specific IRAC criteria were developed by the Unified Command and were based on the substrate composition/habitat and anticipated use (e.g., human, faunal, ecological) of various shoreline types that occurred within the area impacted by the spill. The IRAC inspections were conducted through September 3, 2003 by representatives from USCG, MADEP and the RP. As of September 3, 2003, 119 of 149 shoreline segments, or approximately 80 percent, had met the IRAC criteria. Tables 2-12 through 2-14 summarize the results of IRAC inspections conducted through September 3, 2003. Attainment of IRAC criteria may have occurred prior to the inspection date due to the potential lag time between cleanup efforts and official inspections/sign-off.

Table 2-12. Segments that Passed IRAC

Segment ID	Segment Name	Satisfies IRAC Yes/No	IRAC Inspection Date[1]
E1-01	Grey Gables- Gilder Road Beach	Yes	6/23/2003
E1-02	Mashnee/Hog Islands North	Yes	7/15/2003
E1-03	Mashnee Island	Yes	7/15/2003
E1-04	Mashnee/Hog Islands South	Yes	8/12/2003
E1-05	Monument Beach	Yes	8/12/2003
E1-06	Phinney's Harbor South	Yes	8/14/2003
E1-07	Wings Neck	Yes	6/12/2003
E1-08	Barlow's Landing	Yes	7/15/2003
E1-09	Patuisset	Yes	8/8/2003
E1-10	Scraggy Neck North	Yes	6/11/2003
E1-12	Megansett Beach	Yes	8/28/2003
E1-14	New Silver Beach (Wild Harbor)	Yes	8/28/2003
E1-15	Crow Point	Yes	8/28/2003
E1-16	Old Silver Beach	Yes	8/14/2003
E2-03	Chappaquoit Beach	Yes	8/25/2003
E2-04	Black Beach	Yes	8/25/2003
E2-05	Saconesset Beach	Yes	7/14/2003
E2-06	Hamlin's Point Beach	Yes	7/14/2003
E2-07	Wood Neck Beach	Yes	7/14/2003
E2-09	Quissett Harbor	Yes	7/25/2003
E2-10	Long Neck to Gansett Point	Yes	8/28/2003
E2-11	Penzance Island	Yes	7/25/2003

[1] *Attainment of IRAC criteria may have occurred prior to the inspection date.*

Table 2-12. Segments that Passed IRAC (continued)

Segment ID	Segment Name	Satisfies IRAC Yes/No	IRAC Inspection Date[1]
W1B-01	Taylor Point Canal	Yes	8/23/2003
W1B-02	Taylor Point North	Yes	8/23/2003
W1B-03	Butler Cove	Yes	8/23/2003
W1B-04	Jacob's Neck	Yes	8/23/2003
W1B-05	Pleasant Harbor	Yes	8/24/2003
W1B-06	Broad Cove	Yes	8/24/2003
W1B-07	Stony Point Dike	Yes	7/30/2003
W1B-08	Temples Knob	Yes	6/16/2003
W1B-09	Little Harbor Beach	Yes	8/22/2003
W1B-10	Little Harbor	Yes	8/22/2003
W1B-11	Bourne Cove	Yes	8/22/2003
W1B-12	Warren Point (MA)	Yes	7/10/2003
W1B-13	Indian Neck	Yes	7/10/2003
W1B-14	Long Beach	Yes	6/17/2003
W1B-15	Wareham River East Shore	Yes	6/17/2003
W1B-16	Minot Forest Beach	Yes	6/17/2003
W1B-17	Wareham Neck North	Yes	7/10/2003
W1B-18	Pinehurst Beach	Yes	8/26/2003
W1B-20	Broad Marsh River West	Yes	8/26/2003
W1B-21	Swift's Neck Beach	Yes	7/10/2003
W1B-22	Swift's Beach	Yes	7/10/2003
W1B-23	Mark's Cove	Yes	7/10/2003
W1B-24	Nobska Beach	Yes	9/2/2003
W1B-25	Cromeset Beach	Yes	8/27/2003
W1B-26	Briarwood Beach	Yes	8/27/2003
W1B-27	Rose Point	Yes	8/25/2003
W1B-28	Weweantic River West Shore	Yes	7/28/2003
W1B-29	Delano Road North	Yes	8/25/2003
W1B-30	Delano Road South	Yes	8/15/2003
W1B-31	Great Hill Point	Yes	7/23/2003
W1B-32	Piney Point Beach	Yes	7/23/2003
W1B-33	Piney Point South	Yes	7/23/2003
W1C-03	Planting Island Cove	Yes	8/22/2003
W1C-04	Blankinship Cove	Yes	7/11/2003
W1C-05	Sippican Harbor East	Yes	8/7/2003
W1C-06	Hammet's Cove Beach	Yes	8/22/2003
W1C-07	Little Neck	Yes	8/22/2003
W1C-08	Tabor Academy Beach	Yes	8/22/2003
W1C-09	Marion Town Beach	Yes	8/22/2003
W1C-11	Sippican Harbor West	Yes	7/11/2003
W1D-01	Aucoot Cove	Yes	6/25/2003
W1D-02	Harbor Beach	Yes	6/15/2003
W1D-03	Holly Woods / Hiller Cove	Yes	6/25/2003
W1D-04	Holly Woods / Peases Point	Yes	6/26/2003

[1]*Attainment of IRAC criteria may have occurred prior to the inspection date.*

Table 2-12. Segments that Passed IRAC (continued)

Segment ID	Segment Name	Satisfies IRAC Yes/No	IRAC Inspection Date[1]
W1D-05	Point Connett Beach	Yes	6/25/2003
W1E-01	Nye Cove / Strawberry Cove	Yes	8/25/2003
W1E-04	Crescent Beach	Yes	8/25/2003
W1E-05	Mattapoisett Harbor East	Yes	8/21/2003
W1E-06	Mattapoisett Town Beach	Yes	8/21/2003
W1F-01	Brandt Beach	Yes	8/22/2003
W1F-04	Brandt Island Cove	Yes	8/22/2003
W1F-05	Mattapoisett Neck West	Yes	8/27/2003
W1F-07	Mattapoisett Shores	Yes	8/27/2003
W1F-08	Mattapoisett Neck East	Yes	8/27/2003
W1F-09	Mattapoisett Harbor North	Yes	8/21/2003
W1G	Ram Island	Yes	7/8/2003
W2A-01	Fort Phoenix	Yes	6/24/2003
W2A-02	Harbor View	Yes	6/24/2003
W2A-03	Pope's Beach	Yes	6/24/2003
W2A-04	Manhattan Ave	Yes	6/24/2003
W2A-08	Wilbur Point	Yes	8/15/2003
W2A-09	Sconticut Neck East	Yes	8/12/2003
W2A-11	West Island West	Yes	8/13/2003
W2A-12	Rocky Point to East Cove (Town Beach)	Yes	8/13/2003
W2A-13	East Cove	Yes	9/3/2003
W2A-14	Pine Creek to North Point	Yes	9/3/2003
W2A-15	West Island North	Yes	8/14/2003
W2A-16	Long Island and Causeway North	Yes	8/14/2003
W2A-17	Sconticut Neck Northeast (Marsh)	Yes	6/14/2003
W2A-18	Little Bay (Marsh)	Yes	6/14/2003
W2A-19	Shaw Cove	Yes	8/15/2003
W2B-01	Round Hill to Barekneed Rocks	Yes	8/1/2003
W2B-02	Padanaram Harbor	Yes	7/31/2003
W2B-03	Clarke's Cove West	Yes	8/29/2003
W2B-04	Clarke's Cove East	Yes	8/29/2003
W2B-06	Clarke's Point East	Yes	6/18/2003
W3A-02	Salters Point West	Yes	7/7/2003
W3A-03	Pier Beach (Salters Point)	Yes	7/7/2003
W3A-04	Salters Point East	Yes	7/9/2003
W3A-05	Round Hill Beach West	Yes	7/7/2003
W3B-01	Slocum's River	Yes	8/26/2003
W3C-01	East Beach (Westport)	Yes	7/9/2003
W3C-02	Little Beach	Yes	7/9/2003
W3C-03	Barneys Joy (west of barbed wire)	Yes	7/31/2003
W3C-05	Demarest Lloyd State Park Beach	Yes	6/27/2003
W3C-06	Demarest Lloyd State Park Marsh	Yes	6/27/2003
W3D-01	Quicksand Point	Yes	6/27/2003
W3D-02	Cockeast Pond Beach	Yes	6/27/2003
W3D-03	Elephant Rock Beach	Yes	6/27/2003

[1]*Attainment of IRAC criteria may have occurred prior to the inspection date.*

Table 2-13. Segments that Failed IRAC with Further Work Not Feasible

Segment ID	Segment Name	Satisfies IRAC Yes/No	IRAC Inspection Date[1]
W3D-04	Horseneck Beach West	Yes	6/10/2003
W3D-05	Horseneck Beach East	Yes	6/10/2003
W3D-06	Gooseberry Neck East	Yes	7/9/2003
W3D-07	Gooseberry Neck West	Yes	7/9/2003
W1C-10	Silvershell Beach	No	8/7/2003
W1C-12	Converse Point East	No	8/8/2003
W1E-02	Strawberry Cove	No	9/2/2003
W1F-02	Brandt Island West (Howards Beach)	No	8/22/2003
W1F-03	Brandt Island East	No	9/2/2003
W1F-06	Mattapoisett Neck South	No	9/2/2003
W2A-05	Sunset Beach	No	8/11/2003
W2A-06	Silver Shell Beach	No	8/11/2003
W2A-10	Long Island and Causeway South	No	9/3/2003
W3A-06	Round Hill Beach East	No	8/1/2003

[1]*Attainment of IRAC criteria may have occurred prior to the inspection date.*

Table 2-14. Segments that Failed IRAC with Further Work Feasible

Segment ID	Segment Name	Satisfies IRAC Yes/No	IRAC Inspection Date
E1-11	Scraggy Neck South	No	8/4/2003
E1-13	Nye's Neck	No	8/6/2003
W1C-01	Butler's Point	No	7/28/2003
W1E-03	Strawberry Point West	No	8/25/2003
W2B-05	Fort Taber	No	6/26/2003

3.1 OVERVIEW

Upon notification of the spill, the Trustees immediately initiated on-site emergency data collection efforts and planning for assessment activities. The Trustees, consisting of NOAA as the Lead Administrative Trustee, the State of Massachusetts (acting through the Executive Office of Environmental Affairs), the State of Rhode Island, and the Department of the Interior (acting through the USFWS) coordinated data collection with the RP's representative, ENTRIX.[5] The Trustees formally invited the RP to participate in a cooperative NRDA on June 30, 2003. The Trustees formed a Joint Assessment Team (JAT) consisting of representatives from each of the Trustee agencies and the RP, to coordinate components of the NRDA that were and are being conducted cooperatively. Although the NRDA is a cooperative process, the Trustees maintain formal decision-making authority.

The JAT identified five primary resource categories of concern: Aquatic, Shoreline, Wildlife, Lost Recreational Use, and Lost Tribal Use. To address these resource categories of concern, the Trustees and RP jointly coordinated and conducted a variety of sampling efforts and field surveys to document and characterize potential impacts to natural resources as a result of the spill. These efforts included:

- Collection and analysis of source oil and weathered oil samples;
- Collection and analysis of water column, intertidal and subtidal sediment samples;
- Surveys of birds and wildlife; and
- Interviews and surveys of recreational resources (e.g., interviews with marina operators, surveys of shoreline use, etc.).

3.2 SOURCE OIL

3.2.1 Product Characterization

The released product, No. 6 fuel oil, was a blend of heavy residual oils and lighter oil. The specific physical characteristics of the individual blends carried by the B-120 at the time of the spill are unknown. The specific gravity of No. 6 fuel oil ranges between 0.95 to greater than 1.03. Therefore, when spilled on sea water, No. 6 fuel oil can float, suspend in the water column or sink; however, because No. 6 fuel oil is highly viscous, only a small amount of this type of oil is expected to enter the water column. On the surface of the water, No. 6 fuel oil usually spreads into thick, dark-colored slicks, but can also form tarballs and discrete patches. Due to relatively low percentage of lighter molecular weight hydrocarbons that readily volatilize, as little as five to ten percent of No. 6 fuel oil will evaporate within the first few hours of a release. Additionally, when

[5] *The Wampanoag Aquinnah Tribe of Gay Head initially participated in the NRDA; however, an independent settlement with the RP was reached and as a result, the Tribe is no longer actively participating in the on-going NRDA.*

No. 6 fuel oil comes ashore it tends to remain on the surface rather than penetrate downward into sediments due to its high viscosity (NOAA, 2003).

3.2.2 Collection of Source Oil

Samples of source oil (No. 6 fuel oil) were collected on April 30, 2003 from each of the ten tanks of the B-120 by the USCG to identify the exact composition of the oil and allow for comparison of chemical fingerprints to oil collected in the environment (i.e., identify if oil in the environment is oil from this spill).

The USCG collected two sets of source oil samples from each of the barge's ten tanks, one set for the Trustees and the other set for the RP. One set of samples was provided to the Trustees under chain of custody. The RP's set of samples was sent to B&B for analysis and archiving. Two of the RP's samples, collected from two of the tanks believed to have been compromised (#2 starboard and #2 port), were analyzed for PAH, total petroleum hydrocarbons (TPH), aliphatic or saturated hydrocarbons (SHC), volatile petroleum hydrocarbons (VPH), extractable petroleum hydrocarbons (EPH), and biomarkers (i.e., steranes, diterpanes, and triterpanes).[6] Analytical procedures were conducted in accordance with approved USEPA and MADEP methodologies. Data were validated by ENTRIX using the USEPA Contract Laboratory Program and analytical method specific guidelines as described in Section 2.4.2.

The RP's source oil samples are archived (i.e., frozen) at B&B. The compositions (i.e., fingerprints) of the two analyzed source oil samples are provided in Figures 3-1 and 3-2.

[6] *The initial diver's assessment, conducted by Clean Harbors, reported damage to the #2 starboard hold. As a precaution, samples from both the #2 starboard hold and the #2 port hold were analyzed.*

Figure 3-1. Source Oil Fingerprint – #2 Starboard Tank Sample

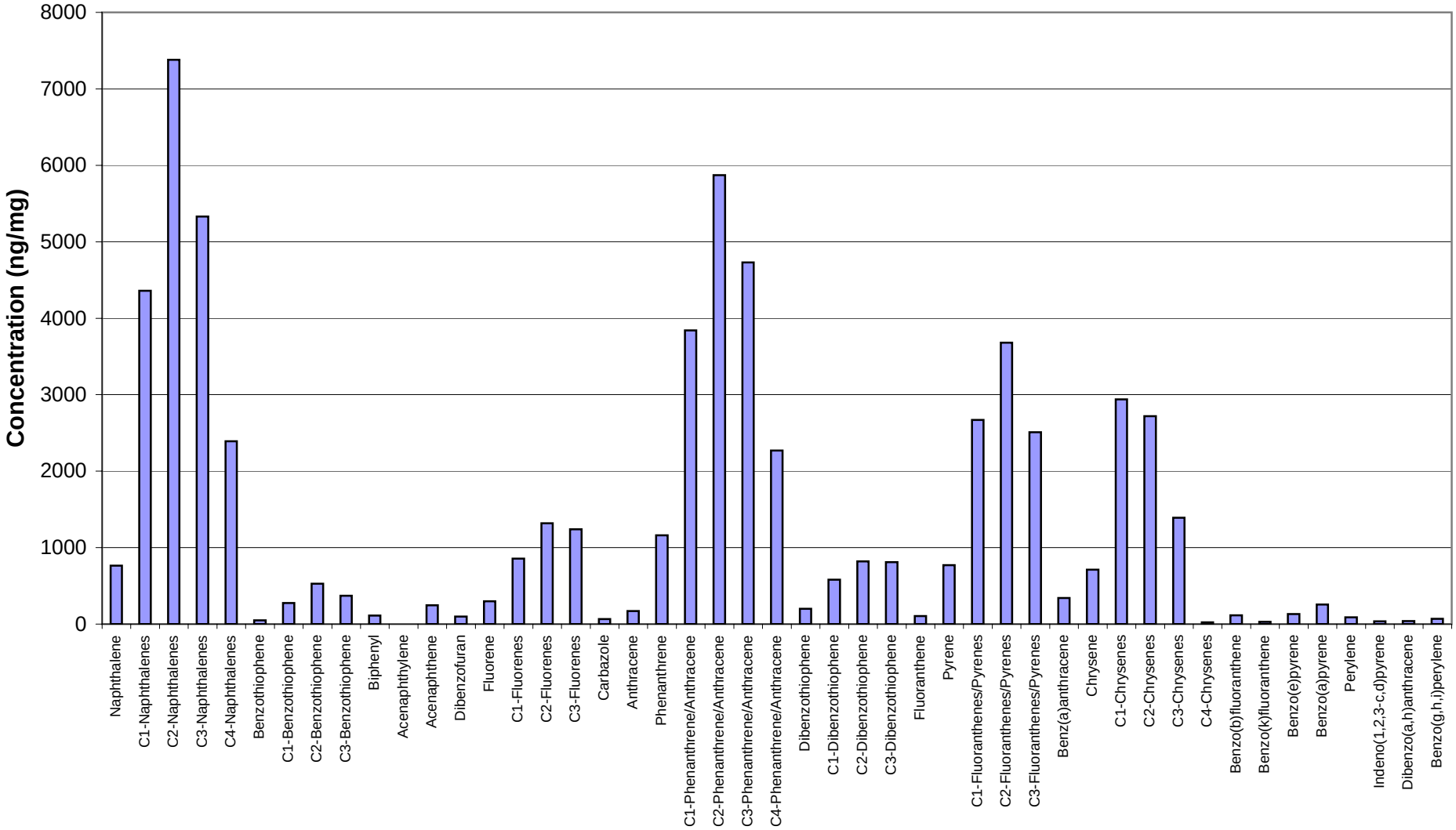
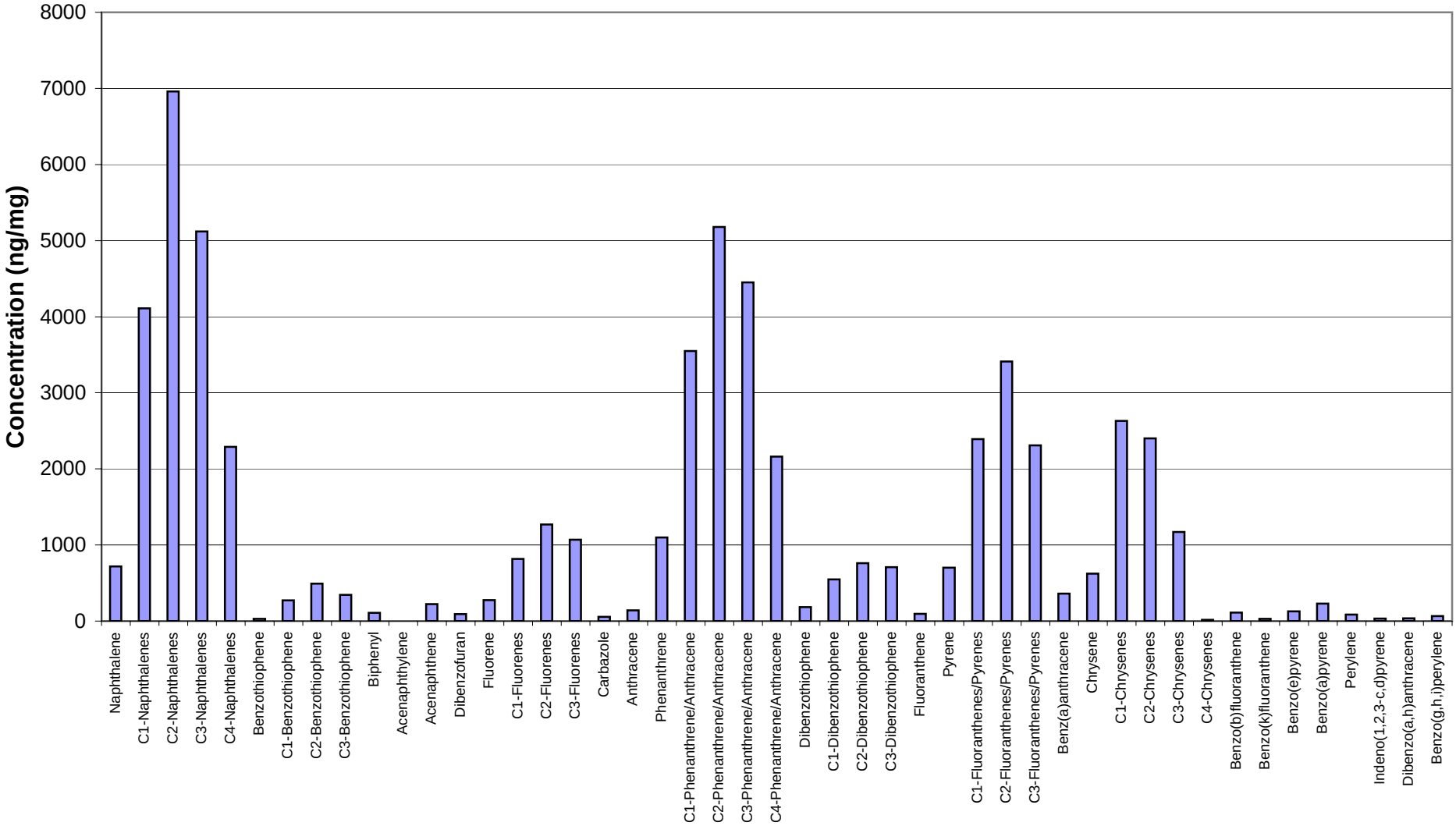


Figure 3-2. Source Oil Fingerprint – #2 Port Tank Sample



3.2.3 Tarballs/Weathered Oil

A total of 37 tarballs and other weathered oil samples were collected from various surface water and shoreline locations from April 29 through September 11, 2003 (Table 3-1). The majority of the samples were collected in Massachusetts and a few samples were collected in Rhode Island. NOAA describes a tarball as weathered oil that has formed pliable balls or patches that float on the water or become stranded on the shoreline. Tarballs can range in diameter from a few millimeters to a foot (NOAA, 1997). Weathered oil refers to oil (i.e., not pure oil) that was collected from the surface of rock, shell or other media. Tarball and weathered oil samples were collected to quantify weathering patterns of the oil and to determine if the source of the oil was the B-120. Tarball and weathered oil samples were collected in pre-cleaned four-ounce glass jars with Teflon-coated lids then placed on wet ice and shipped to B&B under proper chain of custody for analysis.

Fourteen tarball samples were collected and analyzed for PAH, VPH, EPH and biomarkers. Twenty-three weathered oil samples were collected and 17 of these samples were analyzed for PAH. The remaining weathered oil samples (six samples) are archived at B&B. A summary of the tarball and weathered oil samples is presented in Table 3-1. The fingerprint histograms for the tarball and weathered oil samples are provided in Appendix E.

Table 3-1. Summary of Tarball/Weathered Oil Samples

Sample ID	Date Collected	Sample Type	Location
TB-1	4/29/2003	Tarball	Three miles south of Cleveland Ledge (water sample SECL-2), Wareham, MA
TB-2	4/29/2003	Tarball	South of West Island (water sample SWWI-1), Fairhaven, MA
TB-3	4/30/2003	Tarball	North of West Island (water sample SWWI-2A), Fairhaven, MA
WR-WOIL-01	5/5/2003	Weathered Oil	Wareham River - Narrows Rd. Bridge, Wareham, MA
AP-WOIL-01	5/5/2003	Weathered Oil	Allens Point, Sippican Harbor, Marion, MA
AP-WOIL-02	5/5/2003	Weathered Oil	Allens Point, Sippican Harbor, Marion, MA
PP-WOIL-01	5/5/2003	Weathered Oil	Peases Point, E. Mattapoisett, MA
PP-WOIL-02	5/5/2003	Weathered Oil	Peases Point, E. Mattapoisett, MA
BI-WOIL-01	5/5/2003	Weathered Oil	Brandt Island, Mattapoisett, MA
BI-WOIL-02	5/5/2003	Weathered Oil	Brandt Island, Mattapoisett, MA
BI-WOIL-03	5/5/2003	Weathered Oil	Brandt Island, Mattapoisett, MA
PB-WOIL-01	5/5/2003	Weathered Oil	Popes Beach at Bayview, S. Dartmouth, MA
SB-WOIL-01	5/5/2003	Weathered Oil	Salters Beach, S. Dartmouth, MA
NTB-1	5/13/2003	Tarball	Naragansett Town Beach, RI
NTB-2	5/13/2003	Tarball	Naragansett Town Beach, RI
NTB-3	5/13/2003	Tarball	Naragansett Town Beach, RI
SP-1	5/13/2003	Tarball	Sachuest Point NWR, Second Beach, Newport, RI
TB-1	5/13/2003	Tarball	Third Beach, Newport, RI
TB-2	5/13/2003	Tarball	Third Beach, Newport, RI
T/B 120	5/13/2003	Tarball	Barneys Joy Point, Mattapoisett, MA
1A-PI[1]	5/17/2003	Weathered Oil	Planting Island, Marion, MA

Table 3-1. Summary of Tarball/Weathered Oil Samples (continued)

Sample ID	Date Collected	Sample Type	Location
2A-CP[1]	5/17/2003	Weathered Oil	Converse Point, Marion, MA
2A-PI[1]	5/17/2003	Weathered Oil	Planting Island, Marion, MA
2A-CP[1]	5/17/2003	Weathered Oil	Converse Point, Marion, MA
3A-SBBI	5/21/2003	Weathered Oil	Scotch Beach, Block Island, RI
4A-OHBI	5/21/2003	Weathered Oil	Old Harbor Point, Block Island, RI
524-1R	5/24/2003	Tarball	Ram Island, Mattapoisett, MA
MTZ Boulder[2]	6/6/2003	Weathered Oil	Barneys Joy Point, Mattapoisett, MA
UTZ Tarball[2]	6/6/2003	Tarball	Barneys Joy Point, Mattapoisett, MA
Floating[2]	6/6/2003	Tarball	Barneys Joy Point, Mattapoisett, MA
E2-9-ASPH-01*	6/10/2003	Weathered Oil	Quissett Harbor, Falmouth, MA
Holly Woods #1*	8/5/2003	Weathered Oil	Sippican Harbor, Mattapoisett, MA
BI-1	9/5/2003	Tarball	Brandt Island, Mattapoisett, MA
SO-1	9/5/2003	Weathered Oil	West side Mattapoisett Neck, Mattapoisett, MA
Crescent Beach-BI*	9/11/2003	Weathered Oil	Crescent Beach, Block Island, RI
Mansion Beach[1]	9/11/2003	Weathered Oil	Mansion Beach, Block Island, RI
North Point Cow Cove[1]	9/11/2003	Weathered Oil	Cow Cove, Block Island, RI

[1] Samples were not analyzed and are archived at B&B Laboratories.
[2] Samples were analyzed at Louisiana State University and fingerprints are not available.
**The source of the sampled material was determined not to be the B-120 based on the fingerprints*

3.3 AQUATIC RESOURCES

3.3.1 Water Column

A total of 51 water column samples were collected from April 29 through May 12, 2003. Samples were collected at nine stations in the spill area and at two reference stations. Sample locations established within the first 48 hours of the spill were offshore of heavily oiled shorelines and under and near slicks or tar mats in open water. GPS coordinates were recorded for each sample location and subsequent samples were collected at the same sampling locations for consistency.

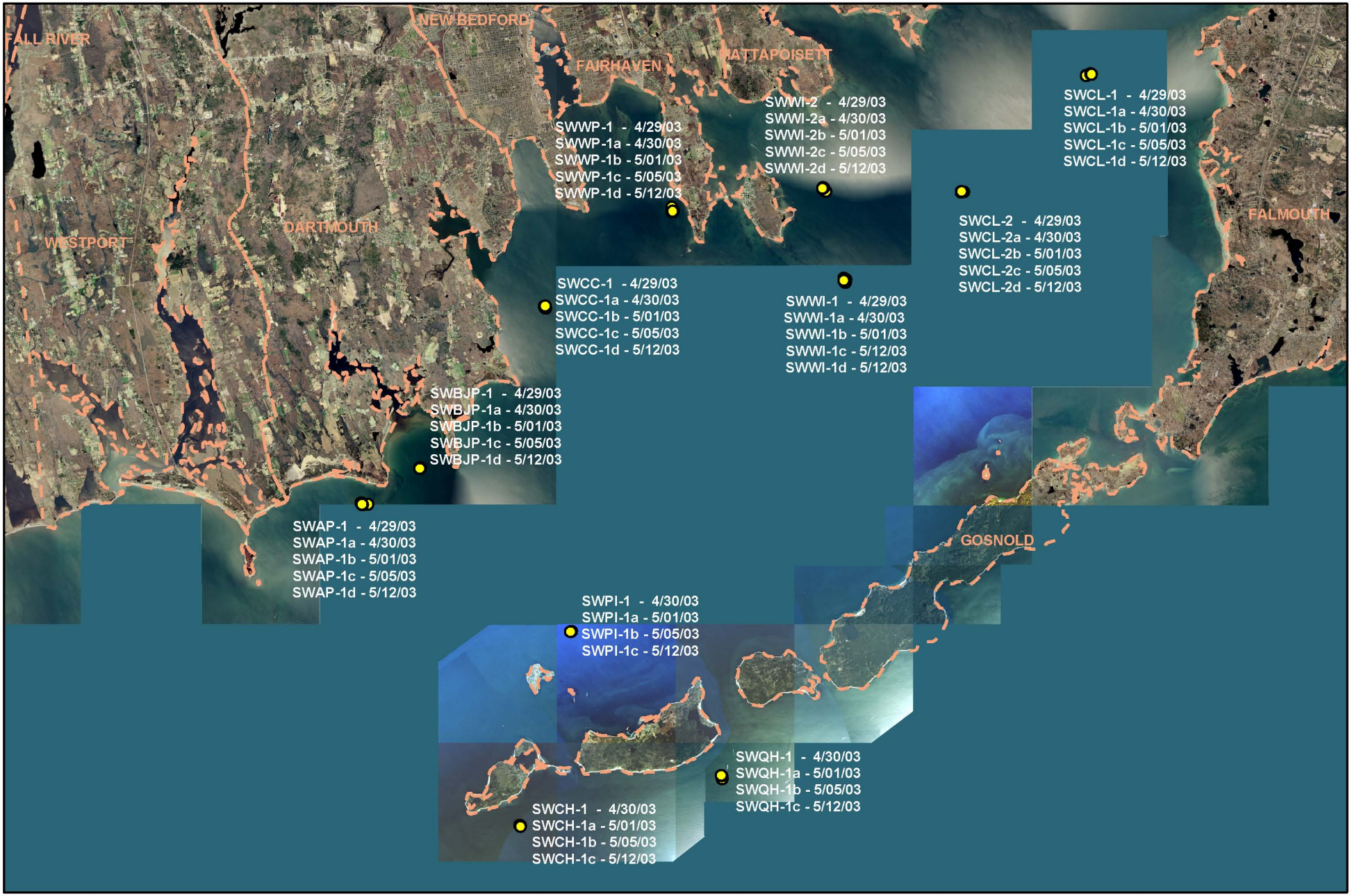
One-liter water column samples were collected by submerging a closed, clean sample container eight to 12 inches below the surface of the water, removing the lid under the water, and allowing the container to fill completely with water. The lid was replaced under water before removing the container. In addition, for Volatile Organic Analysis (VOA), 40 mL vials with HCL preservative were filled by decanting water from a sample container as described above. All water column samples were placed on ice and packed into a field cooler immediately after collection.

Water column samples were sent to Woods Hole Group (WHG) under proper chain of custody for analysis of PAH, VPH, and EPH. Results of PAH analyses of water column samples are summarized in Table 3-2. Sample locations are depicted on Figure 3-3.

Table 3-2. Results of the PAH Analyses for Water Column Sampling

Sample ID	Location	Total PAH (ppb)				
		4/29/03	4/30/03	5/1/03	5/5/03	5/12/03
SWAP-1	Near inlet of Allen's Pond	0.097	0.18	0.15	0.21	0.24
SWBJP-1	North end of Barneys Joy Point	2.7	0.086	0.16	0.17	0.015
SWCC-1	Near entrance of Clark's Cove	0.009	0.011	ND	0.023	ND
SWWP-1	Southwest of Wilbur's Point	0.11	0.014	0.46	0.11	0.028
SWWI-1	1.5 miles south of West Island	0.85	0.27	0.12	0.039	0.014
SWWI-2	North of West Island	0.057	0.64	0.29	0.079	0.063
SWCL-1	Cleveland Ledge Lighthouse	ND	0.45	0.08	0.048	ND
SWCL-2	Three miles south of Cleveland Ledge Lighthouse	0.71	0.16	0.13	ND	ND
SWPI-1	North of Penikese Island	NS	0.15	0.024	ND	ND
SWQH-1	Quicks Hole[1]	NS	0.024	ND	ND	0.13
SWCH-1	Cuttyhunk Island[1]	NS	0.072	ND	ND	ND
DUP-1	Duplicate of SWWI-2	NS	0.38	NS	NS	NS

[1] *Collected as reference sample*
ND = Non detect
NS = No sample collected



Legend

Water Sampling Location

0 5 10 Miles

N

Figure 3-3
Water Column
Sampling Locations
Bouchard B No. 120 Oil Spill
Buzzards Bay, MA

3.3.2 Fish/Shellfish

A total of 32 horseshoe crabs, 66 skates, 12 invertebrates (excluding horseshoe crabs) and seven fish were noted on SCAT field data sheets and Wildlife Reconnaissance Forms between April 29 and June 12, 2003. These numbers include live, dead, oiled, and un-oiled specimens observed along the shoreline during the surveys. Five of the skates and seven lobsters were collected and sent to B&B under proper chain of custody to freeze and hold for potential analysis. As of September 3, 2003, no analyses have been conducted and the cause of the observed mortality has not been determined. No mass mortality (e.g., fish kills or large numbers of benthic organisms washing up onshore) of any species was reported on any data sheets.

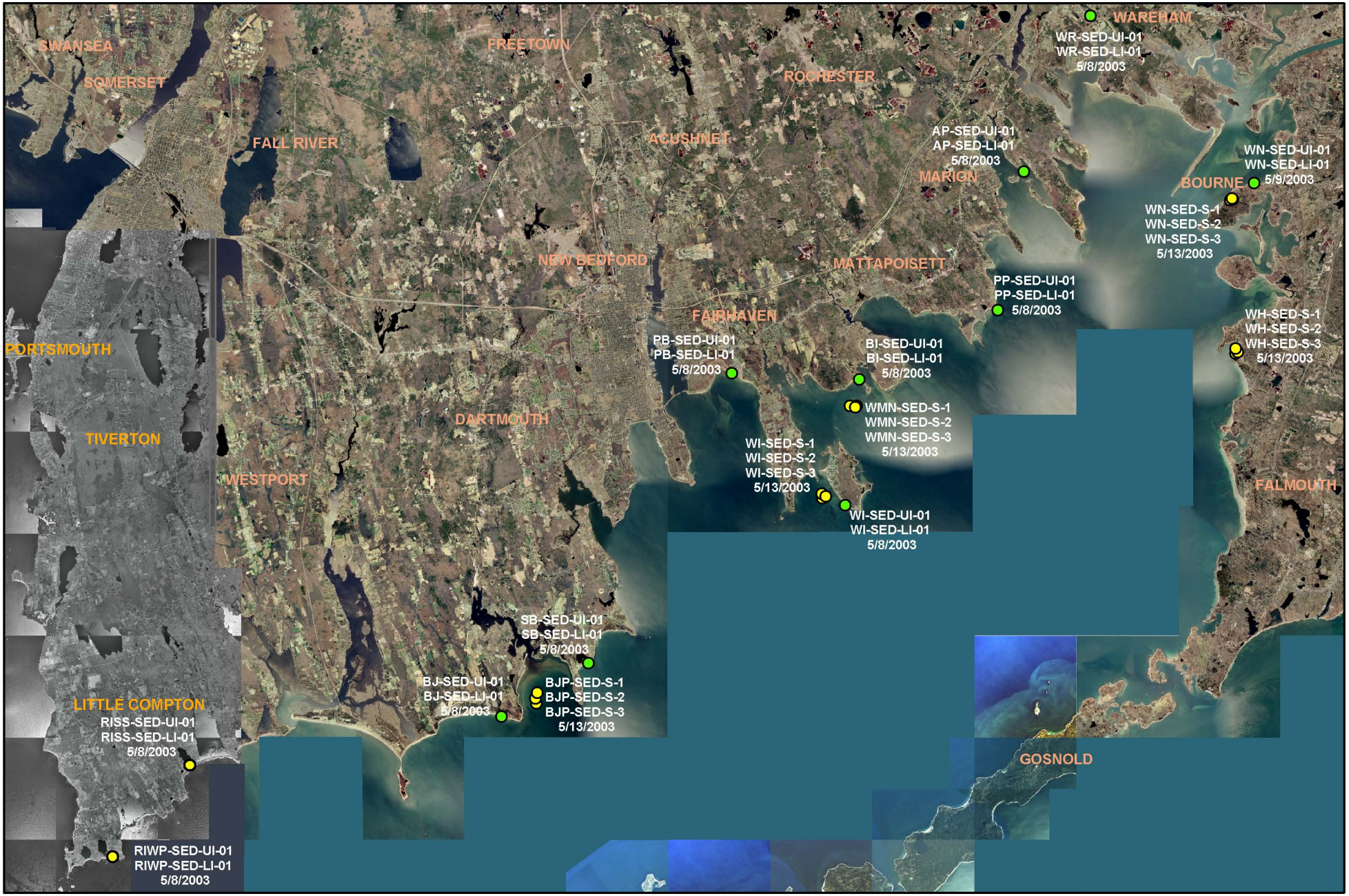
3.4 SHORELINE RESOURCES

Sediment samples were collected between May 7 and May 13, 2003 from subtidal and intertidal areas. Sediment samples were collected in an effort to characterize initial PAH concentrations.

3.4.1 Intertidal Sediment

Between May 7 and May 9, 2003, surficial sediment samples were collected from the intertidal zone at ten locations in the spill area and one reference location unaffected by the spill (Figure 3-4). Samples were collected at heavily oiled beaches and at locations where weathered oil samples were collected. Each location consisted of two stations, one in the upper intertidal zone and one in the lower intertidal zone. At each station, one three-point composite sample was collected. Individual aliquots were collected parallel to the shoreline at ten-meter intervals. Aliquots were collected by pushing a four-ounce glass jar directly into the sediment, thereby collecting approximately the top five centimeters of material. The sample jar was then capped with a Teflon-coated lid. GPS coordinates were recorded for each sample location. All sediment samples were placed on ice in field coolers and were sent to B&B under proper chain of custody.

The three aliquots from each station were composited at B&B and analyzed for PAH, SHC, TPH, and total organic carbon (TOC). Results of the intertidal sediment samples are summarized in Table 3-3.



Legend

- Intertidal Sediment Sampling Location
- Subtidal Sediment Sampling Location

0 4 8 Miles

N

Figure 3-4
Sediment Sampling Locations
Bouchard B No. 120 Oil Spill
Buzzards Bay, MA

Table 3-3. Results of the PAH Analyses for Intertidal Surficial Sediment Sampling

Sample ID	Date Collected	Location	Tidal Zone	Depth (cm)	Total PAH (ppb)
WR-SED-UI-01	05/07/2003	Wareham River - Narrows Road Bridge (SE Corner)	Upper-Intertidal	0 - 5	116
WR-SED-LI-01	05/07/2003	Wareham River - Narrows Road Bridge (SE Corner)	Lower-Intertidal	0 - 5	34.1
AP-SED-UI-01	05/07/2003	Allens Point – Sippican Harbor	Upper-Intertidal	0 - 5	980
AP-SED-LI-01	05/07/2003	Allens Point – Sippican Harbor	Lower-Intertidal	0 - 5	366
PP-SED-UI-01	05/07/2003	Peases Point – East Mattapoisett	Upper-Intertidal	0 - 5	189
PP-SED-LI-01	05/07/2003	Peases Point – East Mattapoisett	Lower-Intertidal	0 - 5	216
BI-SED-UI-01	05/07/2003	Brandt Island	Upper-Intertidal	0 - 5	2,657
BI-SED-LI-01	05/07/2003	Brandt Island	Lower-Intertidal	0 - 5	2,231
PB-SED-UI-01	05/08/2003	Pope's Beach – Sconticut Neck	Upper-Intertidal	0 - 5	5,016
PB-SED-LI-01	05/08/2003	Pope's Beach – Sconticut Neck	Lower-Intertidal	0 - 5	7,325
WI-SED-UI-01	05/08/2003	West Side of West Island	Upper-Intertidal	0 - 5	35,674
WI-SED-LI-01	05/08/2003	West Side of West Island	Lower-Intertidal	0 - 5	8,621
BJ-SED-UI-01	05/08/2003	Barneys Joy	Upper-Intertidal	0 - 5	65,571
BJ-SED-LI-01	05/08/2003	Barneys Joy	Lower-Intertidal	0 - 5	5.2
SB-SED-UI-01	05/08/2003	Salters Beach (Salters Point - Dartmouth)	Upper-Intertidal	0 - 5	178
SB-SED-LI-01	05/08/2003	Salters Beach (Salters Point - Dartmouth)	Lower-Intertidal	0 - 5	330
RISS-SED-UI-01	05/08/2003	South Shore Beach - Rhode Island	Upper-Intertidal	0 - 5	1,405
RISS-SED-LI-01	05/08/2003	South Shore Beach - Rhode Island	Lower-Intertidal	0 - 5	37.7
RIWP-SED-UI-01	05/08/2003	Warren's Point - Rhode Island	Upper-Intertidal	0 - 5	28.8
RIWP-SED-LI-01	05/08/2003	Warren's Point - Rhode Island	Lower-Intertidal	0 - 5	14.9
WN-SED-UI-01	05/09/2003	North Side of Wings Neck[1]	Upper-Intertidal	0 - 5	1.6
WN-SED-LI-01	05/09/2003	North Side of Wings Neck[1]	Lower-Intertidal	0 - 5	270

[1] *Collected as reference sample*

3.4.2 Subtidal Sediment

Surficial sediment samples were collected from the subtidal zone at four locations in the spill area and one reference location on May 13, 2003 (Figure 3-4). Each location consisted of three stations, located approximately 50 meters apart and running parallel to the shoreline. Stations were located between approximately 190 and 2,600 feet offshore. At each station, three aliquots were collected from the top five centimeters of the sediment surface. Aliquots were collected using a Petite Ponar from within an approximate one square-meter area. The three aliquots were homogenized in a disposable sample bowl using the USEPA-approved "core and quarter" technique. One composite sample from each station was collected by pushing a four-ounce glass jar directly into the homogenized material and removing the resultant sample. The sample jar was then capped with a Teflon-coated lid and placed on ice in a field cooler. GPS coordinates were collected for each sample location and sampling equipment was decontaminated in between each station. Decontamination of the Petite Ponar consisted of a wash with a phosphate-free detergent (e.g., Liquinox) and distilled water, followed by a distilled water rinse, an acetone rinse, and a final distilled water rinse. All sediment samples were placed on ice in field coolers and were sent to B&B under proper chain of custody.

The three sediment samples from each location were composited at B&B and analyzed for PAH, SHC, TPH, and TOC. Results of the subtidal surface sediment samples are summarized in Table 3-4.

Table 3-4. Results of the PAH Analyses for Subtidal Surface Sediment Sampling

Sample ID	Date Collected	Location	Total PAH (ppb)
WI-SED-S	05/13/2003	West Island - west side	75
WMN-SED-S	05/13/2003	West Mattapoisett Neck	83.5
WH-SED-S	05/13/2003	Wild Harbor	14.4
BJP-SED-S	05/13/2003	Barneys Joy Point	126.9
WN-SED-S	05/13/2003	North Side of Wings Neck[1]	346

[1] *Collected as reference sample*

3.5 WILDLIFE RESOURCES

On April 27 and 28, 2003 representatives from USFWS, MADFW, NOAA and the RP identified four potentially impacted wildlife groups in addition to aquatic species. They were Birds, Terrapins, Marine Mammals and Beetles. Efforts to assess potential impacts included SCAT searches, shoreline searches, overflights, and species-specific monitoring.

3.5.1 Avian Wildlife Resources

Coordinated wildlife collection and reconnaissance efforts began on April 30, 2003 and were conducted daily through May 16, 2003. Less frequent efforts occurred between May 17 and June 6, 2003. Search teams consisted of representatives from USFWS, MADFW, ENTRIX, and volunteers. Experienced USFWS birders accompanied many search teams and noted live, oiled (not capturable) and un-oiled birds.

Each day search teams were directed to areas where oiled birds were reported. Their primary purpose was to collect live and dead oiled and un-oiled birds. The remaining searchers were directed to other locations around Buzzards Bay. In addition to collecting live and dead birds, search teams helped identify those areas that should receive increased search effort during the next few days. A dedicated wildlife overflight was chartered on May 2, 2003. The purpose was to determine the avian species present and their relative distribution in and around Buzzards Bay. A report summarizing observations from the overflight is presented in Appendix F.

Both oiled and un-oiled birds were brought to the Bird Rehabilitation and Treatment Center. Information relating to these birds was entered into an electronic database by USFWS Law Enforcement Agents. In the weeks following the spill, 499 birds were collected. Of the 184 live oiled birds collected, 20 were rehabilitated and returned to the wild. These included three black scoters, one bufflehead, one Canada goose, four common eiders, eight common loons, a herring gull, a red-breasted merganser and a white-winged scoter. Table 3-5 summarizes the number and species of birds collected, as well as their special conservation status, if applicable.

Species such as the common loon were migrating northward through the Buzzards Bay area at the time of the spill. Reports of potentially oiled common loons in New Hampshire and Maine prompted an investigation to determine whether those loons were oiled in Buzzards Bay. In addition, data were compiled from initial surveys, overflights and pre-existing monitoring programs to identify species-specific field efforts that might be useful. These species-specific field efforts focused on piping plovers, common terns, roseate terns and American oystercatchers.

Table 3-5. Total Oiled and Un-oiled Birds Collected

Species	FLS[1]	MLS[2]	RLS[3]	Collected Dead*	Collected Live*	Total Collected	TD[4]	RRW[5]
American Oystercatcher			Concern	0	1	1	1	0
American Black Duck				2	0	2	2	0
Black Scoter				24	7	31	28	3
Bufflehead				6	1	7	6	1
Canada Goose				4	2	6	5	1
Common Eider				37	12	49	45	4
Common Loon		Special Concern		76	128	204	195	8
Common Tern		Special Concern		6	2	8	8	0
Cormorant				1	0	1	1	0
Double-crested Cormorant				13	2	15	15	0
Dunlin				12	0	12	12	0
Northern Gannet				4	1	5	5	0
Great Cormorant				3	1	4	4	0
Greater Scaup				1	0	1	1	0
Great Black-backed Gull				14	1	15	15	0
Gull				1	0	1	1	0
Herring Gull				14	4	18	18	1
Hooded Merganser			Concern	1	0	1	1	0
Horned Grebe				2		2	2	0
Long-tailed Duck				10	2	12	12	0
Mute Swan				3	0	3	3	0
Passerine				1	0	1	1	0
Piping Plover (chick)	Threatened	Threatened		1	1	2	2	0
Razorbill				4	0	4	4	0
Red-breasted Merganser				5	6	11	10	1
Red-necked Grebe				8	1	9	9	0
Red-throated Loon				28	9	37	37	0
Ring-billed Gull				4	0	4	4	0
Roseate Tern	Endangered	Endangered	Historical	3	0	3	3	0
Scoter				1	0	1	1	0
Sooty Shearwater				1	0	1	1	0
Surf Scoter				7	2	9	9	0
Unknown				8	0	8	8	0
White-winged Scoter				4	1	5	4	1
Willet			Concern	2	0	2	2	0
Yellowlegs				4	0	4	4	0
Totals:				**315**	**184**	**499**	**479**	**20**

[1]***FDL*** *- Federal Listing Status*
[2]***MLS*** *- MA Listing Status*
[3]***RLS*** *- RI Listing Status*
[4]***TD*** *- Total Dead*
[5]***RRW*** *- Rehabilitated and Released to the Wild*
***Includes both oiled and un-oiled birds*

3.5.1.1 Common Loon Monitoring

Reports of potentially oiled common loons in New Hampshire and Maine prompted an investigation to determine whether those loons may have been oiled in Buzzards Bay. When potentially oiled loons were reported, attempts were made to gather feather samples to determine if the substance staining the loon feathers was B-120 oil. These efforts resulted in the capture of one loon from Milton Pond and one loon from Pawtuckaway Pond, both in New Hampshire. These loons died during rehabilitation. Results of fingerprinting analysis performed on both feather samples showed the substance was consistent with B-120 oil.

3.5.1.2 Plover Monitoring

Due to the "threatened" status of the piping plover under the federal Endangered Species Act, the fact that plovers and portions of their habitat had been oiled, and the existence of historical piping plover demographic data, the Trustee and RP assessment team determined that a species-specific assessment was warranted. During the response phase of the spill, a pre-existing network of Massachusetts Audubon, USFWS, MADFW, The Lloyd Center, The Nature Conservancy-Rhode Island, and volunteers (collectively the "Plover Monitoring Network") continued to monitor plovers using existing protocols (i.e., protocols that had been in place for at least three years). Prior to the spill, the following parameters were estimated annually by the Plover Monitoring Network using plover monitoring data from all known plover nesting areas in Rhode Island and Massachusetts:

- Total number of adults;
- Number of nesting pairs;
- Percentage of eggs that hatch; and
- Fledglings per nesting pair.

Immediately following the spill, the degree of plover oiling was observed and recorded in addition to the parameters listed above. Trustee and RP representatives coordinated with the Plover Monitoring Network to assist in the monitoring of plover nests and to obtain data sheets from the current monitoring effort as well as historical data. Monitors associated with this effort collected one live un-oiled chick that later died at the wildlife rehabilitation center and one plover chick found dead in the field. No dead adult plovers were collected or reported.

3.5.1.3 Tern Monitoring

Ram Island, an area used by breeding colonies of both the common tern and the roseate tern (listed as an endangered species under the federal Endangered Species Act), was heavily oiled following the release. Bird and Penikese Islands, which also provide tern habitat, received very light and light oiling, respectively. Because of the protected status of the roseate tern, the fact that terns and portions of their habitat had been oiled, and the existence of historical tern demographic data, the Trustee and RP assessment team opted to extend the pre-existing tern monitoring program in a manner that could facilitate a species-specific assessment of oil spill impacts on terns.

The pre-existing monitoring program is coordinated by MADFW and typically collects data on tern health and reproduction. Following the spill, Tufts University was contracted to expand this program to include information that would facilitate the analysis of potential oil spill impacts on

terns. This included the collection of eggs and feathers for potential chemical analysis and the collection of blood from oiled and un-oiled common terns. In addition, data on the following parameters were collected on Ram, Bird and Penikese Islands and several reference sites:

- Number of nesting pairs of roseate and common terns;
- Percentage of eggs that hatch for roseate and common terns;
- Fledglings per nesting pair for roseate and common terns;
- Adult survival (based on roseate tern banding);
- Occurrence and distribution of oil on the plumage of roseate and common terns;
- Hatching success of eggs laid by common terns at oiled and un-oiled sites; and
- Hatching success and early chick growth of roseate terns at oiled and un-oiled sites.

3.5.1.4 American Oystercatcher Monitoring

Although not listed under the federal Endangered Species Act, the American oystercatcher is one of the six high priority species in the North Atlantic Region under the U.S. Shorebird Conservation Plan (Clark et al., 2000) due to low relative abundance, threats on breeding grounds, threats on non-breeding grounds, and rather restricted non-breeding distribution. The oystercatcher is also listed on the National Audubon Society's (NAS) National Watch List (NAS, 2002). Its status, coupled with observations of oiled oystercatchers and the existence of some historical American oystercatcher data, prompted the assessment team to collect species-specific American oystercatcher data.

Woodlot Alternatives, Inc. (Woodlot) was contracted by the Trustees in late-May 2003 to investigate previous sightings of oiled oystercatchers, to survey for oiled oystercatchers, and to collect information to assist in determining whether a species-specific effort to monitor the reproductive success of oiled birds would be feasible. A report summarizing Woodlot's efforts and observations of potentially oiled oystercatchers is presented in Appendix F. However, this report does not represent a comprehensive accounting of all oiled oystercatcher sightings made by live bird transect surveyors in early- and mid-May 2003.

3.5.2 Non-Avian Wildlife Resources

3.5.2.1 Terrapins

The northern diamondback terrapin turtle is listed as a threatened species under the Massachusetts Endangered Species Act and is known to be present in some Buzzards Bay estuaries, using sandy and marsh areas for nesting and feeding. Because of the terrapin's status, a survey to evaluate threats from the oil spill to terrapins and terrapin habitat was conducted in areas of known terrapin activity identified by the Massachusetts Audubon Society and MADFW.

On May 11, 2003, Don Lewis from the Massachusetts Audubon Society accompanied the Trustees and RP on a boat-reconnaissance of known and potential terrapin habitat that may have been oiled. They visited a number of sites including Sippican Harbor, Aucoot Cove and West Island. The

survey may have been conducted prior to the end of brumation (hibernation) in 2003. During the survey there were no observations of any terrapins and no evidence of terrapin occurrence or activity.

There was no oil observed in surveyed nesting habitat or nearby marsh habitat. However, in Aucoot Cove, approximately 20 feet of oiled wrack was observed adjacent to potential nesting habitat. At West Island, spill residue was observed adjacent to an area that had some of the elements required for terrapin nesting. There were no observations of any terrapins and no evidence of terrapin occurrence or activity in Allen's Pond, Little River and the inlet to Eel Pond. Oil was observed in one location adjacent to potential nesting and rearing habitat located at the inlet to Eel Pond. In this location "a few tarballs in the strand line (<20 feet in length) and a small area (<3 feet in diameter) of oiled cobble" were observed.

3.5.2.2 Marine Mammals

The Cape Cod Stranding Network, Inc. coordinated with USFWS and National Marine Fisheries Service Law Enforcement to document stranded marine mammals encountered during spill response and data collection efforts. Sixteen marine mammals (12 pinnipeds and four cetaceans) were identified along the shoreline of Buzzards Bay between April 27 and June 15, 2003. Table 3-6 provides a summary of identified stranded marine mammals. Potential external evidence of oiling was noted in four cases. Several mammal carcasses were sent to the National Marine Fisheries Service laboratory for necropsy to evaluate whether mortality was spill-related.

Table 3-6. Summary of Oiled and Un-oiled Stranded Marine Mammals

Species	Location	Date Reported	Condition Code Description[1]		Necropsied (Yes or No)	Evidence of Oiling[2]
Harp Seal	Gooseberry Island, Westport	4/30/2003	4	Severely decomposed	No	No
Harbor Seal	Little River Road, Dartmouth	5/3/2003	4	Severely decomposed	Yes	Yes
Harbor Seal	Converse Point, Marion	5/5/2003	4	Severely decomposed	Yes	Yes
Harbor Seal	Butler Point, Marion	5/7/2003	4	Severely decomposed	No	No
Gray Seal	W. Rodney French, New Bedford	5/7/2003	1	Alive[3]	Yes	Yes
Common Dolphin	Scotch Horse Cove Road, Cataumet	5/7/2003	1	Alive[3]	Yes	No
Long-Finned Pilot Whale	Gardener Street, Woods Hole	5/11/2003	1	Alive[3]	Yes	No
Harbor Seal	Cape Cod Canal, Bourne	5/12/2003	3	Moderately decomposed	No	No
Harp Seal	Harborview Lane, Wareham	5/14/2003	3	Moderately decomposed	No	No
Harp Seal	Mattapoisett Neck, Mattapoisett	5/14/2003	4	Severely decomposed	No	No
Unidentified Pinniped	Tarpaulin Cove, Naushon	5/15/2003	3	Moderately decomposed	No	No
Unidentified Pinniped	Willis Lane, Falmouth	5/19/2003	5	Skeletal or mummified remains	No	Not enough information available
Harbor Seal	Marston Court, Mattapoisett	5/20/2003	3	Moderately decomposed	No	No
Harbor Seal	Nonquit, Dartmouth	5/21/2003	4	Severely decomposed	Yes	Yes
Common Porpoise	Cape Codder Road, Falmouth	5/31/2003	3	Moderately decomposed	No	No
White-Beaked Dolphin	Bayshore Road, Falmouth	6/7/2003	4	Severely decomposed	No	Not enough information available

[1]*Standard condition codes developed by the Smithsonian Institution.*
[2]*Evidence of oiling obtained from CCSN field notes.*
[3]*These individuals were alive when collected by the CCSN, but later were euthanized.*

3.5.2.3 Beetles

The American burying beetle and Northeastern beach tiger beetle, listed as endangered and threatened species, respectively, under the federal Endangered Species Act, are both known to utilize habitat near the oiled shorelines of Buzzards Bay. The burying beetle is known to occur on Block and Penikese Island, while the tiger beetle is known to occur near Horseneck Beach.

Because no invasive cleanup activities were conducted in the areas of beetle habitat, because there were no reports of oiled beetles, and because avian resources took priority no beetle-specific field assessments were conducted.

3.6 LOST RECREATIONAL USE

Data were collected to begin determining the potential for loss of recreational shellfishing, shoreline use and boating due to the spill. Data describing the frequency of shellfishing activities were collected to help determine the number of lost shellfishing trips during the closure period. Data on the status of beds since January 2001 were obtained from MADMF and a time-series database was developed detailing the status of each bed, by week, over this period.

In addition, Shellfish Constables from Westport, Dartmouth, New Bedford, Fairhaven, Mattapoisett, Marion, Wareham, Bourne, and Falmouth were interviewed to obtain information on annual catch. The following information was obtained:

- Methodology for generating the annual catch data;
- Catch limits per trip;
- Identification of popular recreational shellfish beds;
- Shellfishing seasons per species; and
- Details of any non-spill related bed closures (e.g., historical and health-based closures).

Shoreline use (e.g., fishing, sunbathing, walking and nearshore boating) in the spill area was documented during five overflights conducted between May 18 and June 26, 2003. Informal interviews with marina owners were conducted to determine the potential impacts to recreational boating. Additional information necessary to quantify the injury for each of these three recreational use categories will be collected as needed.

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APPENDIX A

MADMF SHELLFISH BED RE-OPENING LETTERS

Commonwealth of Massachusetts
Division of Marine Fisheries
251 Causeway Street • Suite 400
Boston, Massachusetts 02114
(617) 626-1520
fax (617) 626-1509

Paul J. Diodati
Director

October 10, 2003

Boards of Selectmen of the following Towns: Westport, Dartmouth, Fairhaven, Mattapoisett, Marion, Wareham, Bourne, Falmouth and Gosnold and the Mayor of the City of New Bedford.

Ladies and Gentlemen:

In accordance with Chapter 130, Section 74A of the Massachusetts General Laws, the Division of Marine Fisheries has re-examined the areas listed below in the Towns of Westport, Dartmouth, Fairhaven, Mattapoisett and Falmouth and the City of New Bedford, closed on April 28 and/or April 30, 2003, due to the release of oil from Bouchard Barge #120.

As a result of this examination which included advice from the Massachusetts Department of Public Health, Bureau of Environmental Health Assessment and the Food Protection Program and consultation with the Massachusetts Department of Environmental Protection, the Division has determined that the ban on shellfish harvesting due to oil contamination may be rescinded in the areas listed below. **All bacterial closures in effect prior to the oil spill closures of April 28 and/or April 30, 2003 in any portions of the areas listed below shall remain in full force and effect.**

Therefore, the below-listed areas, **provided they are not closed due to bacterial contamination as noted above,** are open to the harvest of shellfish for direct human consumption, effective at sunrise, October 13, 2003 and further subject to local rules and regulations under the authority of Massachusetts General Laws, Chapter 130, Section 52.

STATUS; OIL BAN RESCINDED

The ban on shellfishing due to oil has been rescinded in the following state designated shellfish areas in their entirety.

BB:1 Westport South Coastal, Westport
BB:8 Slocums River, Dartmouth
BB:9 Little River, Dartmouth
BB:18 West Island North, Fairhaven
BB:19 West Island East Coastal, Fairhaven, Mattapoisett
BB:22 Little Bay, Fairhaven
BB:23 Brandt Island Cove, Mattapoisett
BB:52 Wild Harbor/Wild Harbor River, Falmouth

The ban on shellfishing due to oil has been rescinded in the following state designated shellfish areas; except in the portion or portions of each of those areas, as described below, which shall remain closed to the harvesting of shellfish.

BB:5 "That portion of BB:5 in the Town of Dartmouth north of a line from the "NO SHELLFISHING" sign at the end of Horseneck Road on the eastern end of East Horseneck Beach at the Westport/Dartmouth town line to the "NO SHELLFISHING" sign at Barney's Joy Point."

BB:7 "That portion of BB:7 on the west side of Smith Neck in the Town of Dartmouth, east of a line from the "NO SHELLFISHING" sign at the Cow Yard to the "NO SHELLFISHING" sign at Mishaum Point."

BB:10 "That portion of BB:10 in the Town of Dartmouth north of a line from the "NO SHELLFISHING" sign at Salters Point to the "NO SHELLFISHING" sign at Round Hill Point."

BB:15 "That portion of BB:15 in the Town of Fairhaven northeast of a line from the "NO SHELLFISHING" sign at the western end of Fort Phoenix Beach to the "NO SHELLFISHING" sign at the southernmost tip of Sconticut Neck at Wilbur Point."

BB: 21 "That portion of BB:21 in the Town of Mattapoisett northerly of a line from the "NO SHELLFISHING" sign at the southern tip of Brandt Island to the "NO SHELLFISHING " sign on the westernmost end of Howard Beach."

BB:20,21,25 "Those portions of BB:20, 21 and 25 in the area of Mattapoisett Neck known as Antassawamock in the Town of Mattapoisett 100 yards seaward of the Mean High-Water Mark between the "NO SHELLFISHING" signs located at the western end of Narragansett Road and the eastern end of Pleasant View Avenue."

BB:25 "That portion of BB:25 in the Town of Mattapoisett at the head of Mattapoisett Harbor north of a line from the "NO SHELLFISHING" sign located on Shining Tide Beach halfway between the southern end of Reservation Road and the mouth of Eel Pond to the "NO SHELLFISHING" sign at the western end of Ship Street."

All other areas in Buzzards Bay closed due to the oil spill on April 28 and/or April 30, 2003 not re-opened above or re-opened on May 21, 2003, shall remain closed until further notice.

The following areas remain closed:

- BB:11 Dartmouth East Coastal, **Dartmouth, New Bedford**
- BB:16 Fairhaven South Coastal, **Fairhaven, New Bedford**
- BB:24 Mattapoisett South Coastal, **Fairhaven, Mattapoisett**
- BB:26 Mattapoisett River, **Mattapoisett**
- BB:27 Eel Pond, **Mattapoisett**
- BB:28 North Buzzards Bay, **Marion, Mattapoisett, Bourne, Falmouth**
- BB:29 Point Connett, **Mattapoisett**
- BB:30 Hiller Cove, **Mattapoisett**
- BB:31 Aucoot Cove, **Mattapoisett, Marion**
- BB:32 Sippican Harbor, **Marion**
- BB:36 Wareham River, **Wareham**
- BB:50* Megansett Harbor, **Bourne, Falmouth**
- E:1* Naushon Island West Coastal, **Gosnold**
- E:4* Gosnold West Coastal, **Gosnold**

* These areas represent partial closures and are defined in the May 21, 2003 closure notice.

Add BB:17

Under the authority of Massachusetts General Laws, Chapter 130, Section 74A and 75, digging, harvesting or collecting and/or attempting to dig, harvest or collect shellfish and the possession of shellfish from closed areas is prohibited.

Under authority of 322 CMR 7.01 (7), all permits issued there-under are hereby conditioned to prohibit the taking, selling or possession of shellfish from closed areas.

Sincerely

Paul J. Diodati
Director

cc: R. Murray, W. McKeon, J. Hanlon, K. Dolan, P. Hanlon, DELE
D. McKiernan, M. Hickey, DMF
R. Packard, WPC, DEP
S. Condon, B. Krueger, P. Tierney, DPH
FDA
M. Landry, USCG
Shellfish Constables of above City and Towns

Commonwealth of Massachusetts
Division of Marine Fisheries
251 Causeway Street • Suite 400
Boston, Massachusetts 02114
(617) 626-1520
fax (617) 626-1509

Paul J. Diodati
Director

November 10, 2003

Board of Selectmen
Town Hall
Marion, MA 02738

Ladies and Gentlemen

In accordance with Chapter 130, Section 74A of the Massachusetts General Laws The Division of Marine Fisheries has re-examined the area listed below in the Town of Marion, closed on April 30, 2003 due to the release of oil from Bouchard Barge #120.

As a result of this examination which included advice from the Massachusetts Department of Public Health, Bureau of Environmental Health Assessment and the Food Protection Program and consultation with the Massachusetts Department of Environmental Protection, the Division has determined that the ban on shellfish harvesting due to oil contamination may be rescinded in the area listed below. **All bacterial closures in effect prior to the oil spill closure of April 30, 2003 in any portions of the area listed below shall remain in full force and effect.**

Therefore, the below-listed area, **provided it is not closed due to bacterial contamination as noted above,** is open to the harvest of shellfish for direct human consumption, effective at sunrise November 12, 2003 and further subject to local rules and regulations under the authority of Massachusetts General Laws, Chapter 130, Section 52.

STATUS; OIL BAN RESCINED

The ban on shellfishing due to oil has been rescinded in the portion of the following state designated shellfish area as described below.

BB:32 Sippican Harbor, Marion

"All of Sippican Harbor in the Town of Marion, except that area 100 yards seaward of the Mean High Water Mark, between the "NO SHELLFISHING" sign at the northern tip of Planting Island to the "NO SHELLFISHING" sign at the southernmost tip of Sippican Neck located at Butler Point."

Sincerely,

Paul J. Diodati
Director

Commonwealth of Massachusetts
Division of Marine Fisheries
251 Causeway Street • Suite 400
Boston, Massachusetts 02114
(617) 626-1520
fax (617) 626-1509

Paul J. Diodati
Director

November 10, 2003

Boards of Selectmen of the following Towns: Westport, Dartmouth, Fairhaven, Mattapoisett, Marion Wareham, Bourne, Falmouth and Gosnold and the Mayor of the City of New Bedford.

Ladies and Gentlemen:

In accordance with Chapter 130, Section 74A of the Massachusetts General Laws, The Division of Marine Fisheries has re-examined the areas listed below in the Towns of Dartmouth, Fairhaven, Mattapoisett, Marion Wareham, Bourne and Falmouth and the City of New Bedford, closed on April 28 and/or April 30, 2003 due to the release of oil from Bouchard Barge #120.

As a result of this examination which included advice from the Massachusetts Department of Public Health, Bureau of Environmental Health Assessment and the Food Protection Program and consultation with the Massachusetts Department of Environmental Protection, the Division has determined that the ban on shellfish harvesting due to oil contamination may be rescinded in the areas listed below. **All bacterial closures in effect prior to the oil spill closures of April 28 and April 30, 2003 in any portions of the areas listed below shall remain in full force and effect.**

Therefore, the below-listed areas, **provided they are not closed due to bacterial contamination as noted above,** are open to the harvest of shellfish for direct human consumption, effective at sunrise November 12, 2003 and further subject to local rules and regulations under the authority of Massachusetts General Laws, Chapter 130, Section 52.

STATUS; OIL BAN RESCINED

The ban on shellfishing due to oil has been rescinded in the following state designated shellfish areas in their entirety.

BB:11 Dartmouth East Coastal, **Dartmouth, New Bedford**
BB:16 Fairhaven South Coastal, **Fairhaven, New Bedford**
BB:24 Mattapoisett South Coastal, **Mattapoisett, Marion**
BB:26 Mattapoisett River, **Mattapoisett**
BB:27 Eel Pond, **Mattapoisett**
BB:28 North Buzzards Bay, **Marion, Falmouth, Bourne**

OVER

BB:29 Point Connett, **Mattapoisett**
BB:30 Hillar Cove, **Mattapoisett**
BB:31 Aucoot Cove, **Marion, Mattapoisett**

The ban on shellfishing has been rescinded in the portion or portions of the following state designated shellfish areas described below.

BB:25 That portion of BB:25 in the Town of **Mattapoisett** at the head of Mattapoisett Harbor north of a line from the "NO SHELLFISHING" sign located on Shining Tide Beach halfway between the southern end of Reservation Road and the mouth of Eel Pond to the "NO SHELLFISHING" sign at the western end of Ship Street.

BB:50 That portion of BB:50 in the Towns of **Bourne** and **Falmouth** east of a line drawn from the day marker at the westernmost point of Scraggy Neck in the Town of Bourne to the tip of Nyes Neck in the Town of Falmouth; and west of a line drawn from the mouth of Fiddlers Cove at Waterside Avenue in the Town of Falmouth to the southernmost tip of Scraggy Neck in the Town of Bourne.

STATUS; OIL BAN IN EFFECT

The ban on shellfishing due to oil remains in effect in the following state designated shellfish area in its entirety. This area remains closed to the harvesting of shellfish.

BB:17 West Island South, **Fairhaven**

The ban on shellfishing remains in effect in the portion or portions of the following state designated shellfish areas described below. All of these areas shall remain closed to the harvesting of shellfish.

BB:5 That portion of BB:5 in the Town of **Dartmouth** north of a line from the "NO SHELLFISHING" sign at the end of Horseneck Road on the eastern end of East Horseneck Beach at the Westport/Dartmouth town line to the "NO SHELLFISHING" sign at Barney's Joy Point.

BB:7 That portion of BB:7 on the west side of Smith Neck in the Town of **Dartmouth,** east of line for the "NO SHELLFISHING" sign at the Cow Yard to the NO SHELLFISHING" sign at Mishaum Point.

BB:10 That portion of BB:10 in the Town of **Dartmouth** north of a line from the "No Shellfishing" sign at Salters Point to the "NO SHELLFISHING sign at Round Hill Point.

BB:15 That portion of BB:15 in the Town of **Fairhaven** northeast of a line from the "NO SHELLFISHING" sign at the southernmost tip of Sconticut Neck at Wilbur Point.

BB:21 That portion of BB:21 in the Town of **Mattapoisett** northerly of a line from the "NO SHELLFISHING" sign at the southern tip of Brandt Island to the "NO SHELLFISHING" sign on the westernmost end of Howard Beach.

BB:20,21,25 Those portions of BB:20, 21, and ~~25 in~~ the area of Mattapoisett Neck known as Antassawamock in the Town of **Mattapoisett** 100 yards seaward of the Mean High-Water Mark between the "NO SHELLFISHING" signs located at the western end of Narragansett Road and the eastern end of Pleasant View Avenue.

BB:50 That portion of Scraggy Neck in the Town of **Bourne** 100 yards seaward of the Mean High Water mark between the "NO SHELLFISHING" sign located at the westernmost point of Scraggy Neck and the "NO SHELLFISHING" sign at the southeasternmost tip of Scraggy Neck.

E:1 That portion of the western shoreline of Naushon Island in the Town of **Gosnold** seaward 100 yards from the Mean High Water Mark.

E:4 That portion of the western shoreline of Pasque Island in the Town of **Gosnold** seaward for 100 yards from the Mean High Water Mark.

E:4 That portion of Penikese Island in the Town of **Gosnold** seaward 100 yards from the Mean High Water Mark.

Under the authority of Massachusetts General Laws, Chapter 130, Section 74A and 75, digging, harvesting or collecting and/or attempting to dig, harvest or collect shellfish and the possession of shellfish from closed areas is prohibited.

Under authority of 322 CMR 7.01 (7), all permits issued there-under are hereby conditioned to prohibit the taking, selling or possession of shellfish from closed areas.

Sincerely,

Paul J. Diodati
Director

Cc: R. Murray, J. Hanlon, K. Dolan, P. Hanlon, DELE
D. McKiernan, M. Hickey, DMF
R. Packard, WPC, DEP
S. Condon, E. Krueger, P. Tierney, DPH
FDA
M. Landry, USCG
Shellfish Constables of above City and Towns

Commonwealth of Massachusetts
Division of Marine Fisheries
251 Causeway Street • Suite 400
Boston, Massachusetts 02114
(617) 626-1520
fax (617) 626-1509

Paul J. Diodati
Director

November 10, 2003

Board of Selectmen
Town Hall
Wareham, MA 02571

Ladies and Gentlemen:

In accordance with Chapter 130, Section 74A of the Massachusetts General Laws, The Division of Marine Fisheries has re-examined the area listed below in the Town of Wareham, closed on April 30, 2003 due to the release of oil from Bouchard Barge #120.

As a result of this examination which included advice from the Massachusetts Department of Public Health, Bureau of Environmental Health Assessment and the Food Protection Program and consultation with the Massachusetts Department of Environmental Protection, the Division has determined that the ban on shellfish harvesting due to oil contamination may be rescinded in the area listed below. **All bacterial closures in effect prior to the oil spill closure of April 30, 2003 in any portions of the area listed below shall remain in full force and effect.**

Therefore, the below-listed area, **provided it is not closed due to bacterial contamination as noted above,** is open to the harvest of shellfish for direct human consumption, effective at sunrise November 12, 2003 and further subject to local rules and regulations under the authority of Massachusetts General Laws, Chapter 130, Section 52.

STATUS; OIL BAN RESCINED

The ban on shellfishing due to oil has been rescinded in the following state designated shellfish area in their entirety.

BB:36 Wareham River, **Wareham**

Sincerely,

Paul J. Diodati
Director

OVER

Cc: R. Murray, J. Hanlon, K. Dolan, P. Hanlon, DELE

JOHN

The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
251 Causeway Street, Suite 900
Boston, MA 02114-2119

Mitt Romney
GOVERNOR

Kerry Healey
LIEUTENANT GOVERNOR

Ellen Roy Herzfelder
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
or (617) 626-1180

FOR IMMEDIATE RELEASE:
May 21, 2003

CONTACT:
Felix Browne 617-626-1119

STATE ENVIRONMENTAL OFFICIALS ANNOUNCE PARTIAL RE-OPENING OF BUZZARDS BAY SHELLFISH BEDS

50% of beds representing up to $2m in annual catch to re-open

Officials from the Massachusetts Division of Marine Fisheries announced today that roughly half of the shellfish beds closed on April 28, 2003 due to the Bouchard Transportation oil spill will re-open as of sunrise tomorrow (5/22/03).

Upon verifying the results of extensive sample testing, the Division of Marine Fisheries has determined that certain areas of coastline in Bourne, Dartmouth, Fairhaven, Falmouth, Gosnold, Marion, Mattapoisett, New Bedford, Wareham and Westport should be re-opened to shell fishing. Local shellfish authorities should be contacted for information regarding specific fishing areas in these towns.

Areas set for re-opening tomorrow comprise approximately 90,000 acres, roughly half of the bay's 180,000-acre area. The April 28, 2003 closure of the bay affected an estimated 50 miles of shoreline and severely impacted commercial shell fishing and wildlife.

"I am pleased that we are able to re-open such a significant portion of Buzzard's Bay after this serious ecological insult. We will continue to monitor the environmental impacts of this spill and will remain mindful of the economic effects as well," said Environmental Affairs Secretary Ellen Roy Herzfelder.

Coordinated efforts between NOAA Fisheries, the United States Coast Guard, US Fish and Wildlife and the State of Massachusetts have sought to evaluate the oil impacts in cooperation with Bouchard and it representatives. Ninety miles of shoreline have been assessed of which an estimated 50 miles have been oiled to varying degrees. The areas due to re-open tomorrow were not oiled as a result of the April 27, 2003 spill and neither shellfish nor shellfish habitat in these areas was affected.

-more-

Constant surveillance of the shoreline of Buzzards Bay by highly trained Shoreline Cleanup Assessment Teams enabled daily map construction of the bay. An analysis of shellfish tissue taken from these mapped areas was undertaken in cooperation with the Massachusetts Department of Public Health and the Department of Environmental Protection. The analysis determined that shellfish from these areas were not affected by the spill.

"Efforts by local officials and volunteers have been instrumental in this opening and will be vital to the continuation of the clean up. Sampling of shellfish by the Division of Marine Fisheries from the remaining closed areas is ongoing and will determine the extent of public health and environmental impacts," said Department of Fisheries, Wildlife and Environmental Law Enforcement Commissioner David Peters.

Local shellfish authorities should be contacted for information regarding specific fishing areas.

###

JOHN

Commonwealth of Massachusetts

Division of Marine Fisheries

251 Causeway Street • Suite 400

Boston, Massachusetts 02114

(617) 626-1520

fax (617) 626-1509

Paul J. Diodati

Director

May 21, 2003

Boards of Selectmen of the following Towns: Westport, Dartmouth, Fairhaven, Mattapoisett, Marion, Wareham, Bourne, Falmouth and Gosnold and the Mayor of the City of New Bedford.

Ladies and Gentlemen:

In accordance with Chapter 130, Section 74A of the Massachusetts General Laws, the Division of Marine Fisheries has re-examined the areas listed below: in the Towns of Westport, Dartmouth, Fairhaven, Mattapoisett, Marion, Wareham, Bourne, Falmouth and Gosnold and the City of New Bedford, closed as a precautionary measure on April 28 and /or 30, 2003, due to an oil spill consisting of #6 oil.

As a result of this examination and consultation with the Massachusetts Department of Public Health and the Massachusetts Department of Environmental Protection, the Division has determined that neither shellfish nor shellfish habitat were affected by the spilled oil and has changed the status of these areas to "OPEN TO SHELLFISHING", effective at sunrise on May 22, 2003.

The below listed areas may now be opened to the harvest of shellfish for direct human consumption subject to local rules and regulations under authority of Massachusetts General Laws Chapter 130, section 52.

STATUS: OPEN TO SHELLFISHING

All closures in effect prior to April 28 and/or April 30, 2003 in any portions of the areas listed below in Buzzards Bay shall remain in full force and effect

BB3 WEST BRANCH WESTPORT RIVER, **WESTPORT**
BB4 EAST BRANCH WESTPORT RIVER, **WESTPORT**
BB12 APPONAGANSETT BAY, **DARTMOUTH**
BB13 CLARK COVE, **DARTMOUTH/NEW BEDFORD**
BB14 NEW BEDFORD EAST COAST, **FAIRHAVEN/NEW BEDFORD/DARTMOUTH**
BB33 STONY POINT DIKE, **MARION/WAREHAM**
BB34 WINGS COVE, **MARION**
BB35 WEWEANTIC RIVER, **MARION/WAREHAM**
BB37 LITTLE HARBOR/BOURNE COVE, **WAREHAM**
BB38 WINGS NECK-NORTH, **WAREHAM/BOURNE**
BB39 WIDOW COVE, **WAREHAM/BOURNE**
BB40 ONSET BAY, **WAREHAM/BOURNE**
BB41 SUNSET COVE, **WAREHAM**
BB42 EAST RIVER SYSTEM, **WAREHAM**

BB43 FISHERMAN COVE, WAREHAM/BOURNE
BB44 BUTTERMILK BAY, BOURNE/WAREHAM
BB46 PHINNEYS HARBOR, BOURNE
BB47 BACK RIVER/EEL POND, BOURNE
BB48 POCASSET RIVER, BOURNE
BB49 POCASSET AND RED BROOK HARBORS, BOURNE
* BB50 MEGANSETT HARBOR BOURNE/FALMOUTH (see below)
BB51 NORTH FALMOUTH OUTER HARBOR, FALMOUTH
BB53 HERRING BROOK, FALMOUTH
BB54 WEST FALMOUTH HARBOR, FALMOUTH
BB55 FALMOUTH WEST COAST, FALMOUTH
BB56 GREAT SIPPIWISSET MARSH, FALMOUTH
BB57 LITTLE SIPPIWISSET MARSH, FALMOUTH
BB58 QUISSETT HARBOR, FALMOUTH
** E1 NAUSHON ISLAND WEST COAST, GOSNOLD/FALMOUTH (see below)
E2 HADLEYS HARBOR, GOSNOLD
E3 NORTHWEST GUTTER, GOSNOLD
*** E4 GOSNOLD WEST COAST, GOSNOLD (see below)
E10 WESTEND POND, GOSNOLD

STATUS: CLOSED TO SHELLFISHING

* BB50 Megansett Harbor: That portion of Megansett Harbor east of a line drawn from the day marker at the westernmost point of Scraggy Neck in the Town of Bourne to the day marker at the tip of Wings Neck in the town of Falmouth; and, west of a line drawn from the Mouth of Fiddlers Cove at Waterside Avenue in the Town of Falmouth to the southernmost tip of Scraggy Neck in the Town of Bourne.

** E1 Naushon Island: That portion of the western shoreline of Naushon Island in the Town of Gosnold seaward 100 yards from the high water mark.

*** E4 Pasque Island: That portion of the western shoreline of Pasque Island in the Town of Gosnold seaward for 100 yards from the high water mark, and, that portion of Penikese Island in the Town of Gosnold seaward 100 yards from the high water mark.

All other areas in Buzzards Bay closed due to the oil spill on April 28 and/or 30, 2003, not listed above, shall remain closed until further notice.

Sincerely,

Paul J. Diodati,
Director

cc: R. Murray, W. McKeon, K. Dolan, P. Hanlon, DEP/E
D. McKiernan, M. Hickey, DMF
WPC, DEP
DPH
FDA
Shellfish Constables of above City and Towns

APPENDIX B

ANALYTICAL PARAMETERS AND METHODS

Table B-1. Analytical Parameters and Methods

Analytical Parameter	Method	Matrix	Laboratory
Volatile Petroleum Hydrocarbons (VPH)	MADEP-VPH-98-1: *Volatile Petroleum Hydrocarbons* (GC/PID,FID)	Product, Water	Woods Hole Group Laboratory
Extractable Petroleum Hydrocarbons (EPH)	MADEP-EPH-98-1: *Extractable Petroleum Hydrocarbons* (GC/FID)	Product, Water	Woods Hole Group Laboratory
Polycyclic Aromatic Hydrocarbons (PAH) and Heterocyclic Compounds (Biomarkers)	Modified SW-846: SOP O-008 *Analysis of Parent and Alkylated Polynuclear Aromatic Hydrocarbons and Selected Heterocyclic Compounds* (GC/MS-SIM)	Product	Woods Hole Group Laboratory
Polycyclic Aromatic Hydrocarbons (PAH)	Modified SW-846: SOP O-008 *Analysis of Parent and Alkylated Polynuclear Aromatic Hydrocarbons and Selected Heterocyclic Compounds* (GC/MS-SIM)	Water	Woods Hole Group Laboratory
Aliphatic Hydrocarbons	Modified SW-846: SOP 1016 *Aliphatic Hydrocarbon Determination by Gas Chromatography/Flame Ionization Detection* (GC/FID)	Product, Sediment	B&B Laboratories
Total Petroleum Hydrocarbons (TPH)	Modified SW-846: SOP 1013 *Determination of Total Petroleum Hydrocarbons in Extracts of Tissue, Water, Soil, and Sediment* (GC/FID)	Product, Sediment	B&B Laboratories
Polycyclic Aromatic Hydrocarbons (PAH)	Modified SW-846: SOP 1006 *Aromatic Hydrocarbon Determination by Selected Ion Monitoring Gas Chromatography/Mass Spectrometry* (GC/MS-SIM)	Product, Tissue, Sediment	B&B Laboratories
Total Organic Carbon (TOC)	Modified SW 846: SOP 1005 *Determination of Total Organic Carbon and Inorganic Carbon in Soils and Sediments* (IR)	Sediment	B&B Laboratories

APPENDIX C

QA/QC SUMMARY

APPENDIX C. DATA QUALITY AND VALIDATION

The analytical laboratories provided a full data report for all deliverables, which included a case narrative, data summary sheets, blank results, duplicate results, matrix spike (MS) and matrix spike duplicate (MSD) recoveries, surrogate recoveries, standard reference material (SRM) recoveries, laboratory control sample (LCS) recoveries, surrogate recoveries, and data flags. Also, data reports contained all raw data. The raw data included all sample and QC chromatograms, initial and continuing calibration checks, extraction and run logs, and all other instrument outputs.

WHG qualifies as an approved analytical laboratory providing high quality usable data as indicated by several certifications and approvals conferred by the MADEP, New Jersey Department of Environmental Protection, Rhode Island Department of Health, Connecticut Department of Health, and U.S. Army Corps of Engineers. Similarly, B&B has performed analyses for several federal agencies including the EPA, U.S. Fish & Wildlife Service, and National Oceanic and Atmospheric Administration (NOAA). In addition, B&B undergoes an intercalibration exercise each year with the National Institute for Standards and Technology (NIST) and annual laboratory audits are performed by NOAA.

ENTRIX has established an internal QA program to assure that all project analytical data are tracked and are of reliable and comparable data quality. A review is performed of each data package resulting from the collection and analysis of samples from the B-120 spill. The validation is comparable to a EPA Contract Laboratory Program (CLP) Level 3, with verification of not only the reported results but also a review of chromatographic output, instrument calibration, and QC standards using criteria equivalent to those of the EPA CLP program and consistent with a EPA and NOAA approved QA project plan (ENTRIX 2001).

A review of data completeness, laboratory precision, data quality, and error checks is performed as outlined by the CLP format and includes:

- *Data package completeness*: This step confirms that the laboratory has provided the deliverables required by the method and/or project plan. During data validation, receipt and completeness of deliverables is checked and documented against the project requirements.
- *Laboratory performance*: Laboratory performance can be evaluated from quality control summaries provided by the laboratory. Elements of laboratory performance common to most methods are:
    - Holding Times (did the laboratory analyze the samples within the required time frame?);
    - Calibration (were instruments calibrated at the correct levels and frequencies?);
    - Blanks (did the blanks contain target compounds that indicate samples may be contaminated from laboratory procedures?);

- Bias (do laboratory spiking test show high or low recoveries that may bias associated sample results?);
- Precision (are results reproducible when duplicated?); and
- Other Quality Control Results (did method-specific items meet the QC goal?).

After validation is completed, qualifiers are assigned to the data points that are affected by quality control outliers. Qualifiers indicate to the data user that compound concentrations may be affected by laboratory or field contamination (in the case of blank contamination), unusable because of quality control deficiencies, and/or estimated due to possible bias or reduced confidence in the results.

Quality control criteria used to assess the data follows the quality assurance project plan (QAPP) of the Swanson Creek Marsh Oil Spill Incident, which was approved by the EPA and NOAA. The QAPP was developed to present the analytical methods and QA/QC requirements for the investigations related to the Swanson Creek Marsh Oil Spill Incident that occurred on April 7, 2000 in the Swanson Creek marsh of the Patuxent River near the Potomac Electrical Power Company (Pepco) Chalk Point Generating Station in Maryland (ENTRIX 2001). The QAPP was prepared in accordance with the guidance manuals *EPA Requirements for Quality Assurance Project Plans for Environmental Data* (EPA 1998) and *Guidance for the Data Quality Objectives Process* (EPA 1994). The Pepco QAPP addresses all sample matrices and analyses that are currently being conducted for the B-120 spill. B&B and ENTRIX apply the strict standards outlined in the Pepco QAPP to all data analyses and validations conducted for the spill.

APPENDIX D

IMMEDIATE RESPONSE ACTION: TREATMENT AND COMPLETION GUIDELINES

ORIGINAL FILE

Immediate Response Action:
Treatment and Completion Guidelines
Bouchard Tank Barge 120 Oil Spill, Buzzards Bay
May 23, 2003

Preamble:
The development of shoreline treatment and completion criteria is a consensual process between the state and federal governments and the responsible party and in consultation with the natural resource trustees. Generally it is designed to identify decision points whereby the operational aspects of the cleanup may be changed as a function of cleanup progresses based on qualified inspection. These decision points take into account the phased aspect of shoreline cleanup that include the removal of potentially mobile oil, active shoreline treatment using approved methods and eventually more passive measures or natural attenuation. These three phases represent increasing intervals of time. Mobile oil or gross oil removal is relatively rapid. Active shoreline treatment will be a matter of weeks, in this case, utilizing cleanup crews and approved methods. Passive treatment or natural attenuation can last years and will be the subject of future discussions.

At each decision point for a particular section of shoreline a team of specialists is deployed to survey and assess the progress. If the area meets the criteria, then the section of shoreline is moved to the next phase. If it does not and oil can continue to be practically removed without increased injury to the resource, treatment continues.

The cleanup of State and federally listed species habitat is recognized as a priority, and specific conditions are referenced herein. The team of specialists that make cleanup decisions should include representatives of FWS and MDFW. All cleanup decisions in piping plover or roseate tern habitat must be approved by FWS and MDFW personnel. Cleanup decisions in areas occupied by other State listed species (list attached) should be made in consultation with the MDFW.

Cleanup operations should be reinitiated if conditions change such that areas are confirmed to have been re-oiled and completion criteria are no longer met. Any areas of re-oiling identified will be jointly investigated with a SCAT team, including FWS and/or MDFW personnel. If it is determined that that the completion criteria are no longer met and trust resources or their habitats have been adversely affected, additional cleanup will be initiated until the area meets the completion criteria.

As the oil weathers due to natural processes, the shoreline conditions may change. If conditions change sufficiently to readdress the criteria outlined in this document, the Unified Command and their technical advisors will reopen discussions and consider the redraft of this document.

Section One

Traditional, non-intrusive collection and cleaning methods are approved for consideration pending a plan from the Responsible Party (RP) and their spill management team. The recovery plan should describe the method proposed and either the sediment/habitat type on which the method is

to be used and/or the geographic area on which the method is proposed. Such methods include, but are not limited to[1]:

1. Deluge flushing into collection
2. Low pressure, ambient water flushing into collection
3. Low pressure, warm water flushing into collection (temperatures not to exceed 70° C)
4. Snare staked in the intertidal zone
5. Manual removal

Note: All flushing should be conducted in such a way as to not contaminate areas of the lower intertidal zone. Flushing into a falling tide, from high-tide to mid-tide is recommended, but not necessarily required.

A. Heavily Utilized, Public Recreational Sand Beaches*

Completion Recommendations

1. No visible surface or subsurface oil (not detectable by sight, smell, feel), to the maximum extent possible, as rapidly as possible.

B. Less Utilized, Semi-Public and Private Sand Beaches*

Completion Recommendations

1. No visible surface, subsurface oil to trace[2], to the maximum extent possible.

Methods Available

1. Manual removal with minimal clean sediment removal
2. Manual or mechanical (with Unified Command (UC) approval) removal of oiled wrack
3. Removal of buried oil
    a. Sites will be surveyed by the digging of 1 foot deep pits at or near the last high tide (LHT) line and the inspection of that pit for tarballs or other oil contamination.
    b. The inspection pits will be dug at an interval of 50 yards with a minimum of four pits.
    c. If oil is found, the extent of the oil burial will be delineated by the use of successive pits and marked.
    d. Test pits will be closed immediately after inspection.
    e. Buried oil will be removed with minimal clean sediment removal.

Restrictions

1. Wrack that is NOT oiled should NOT be removed from the beach.

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[1] Methods described are not designed for roseate tern, piping plover habitat or salt marsh. Separate plans are recommended for these areas.

* Per USFWS and MDFW, If piping plovers (a state and federally listed threatened species) are determined to be utilizing these beaches, refer to the 'Piping Plover Habitat" section of this document below.

[2] "Trace (discontinuous film or spots of oil, an odor, or tackiness)" Shoreline Assessment Manual, HAZMAT Report No. 2000-1, August 2000

C. Mixed Sand & Gravel, Gravel (pebble to boulder) and Rip Rap Groins (jetties)

Completion Recommendations

1. No sheen
2. Surface: Oil does not come off on the finger when touched
3. Subsurface: Trace[3]

Methods Available

1. Manual removal of oil with minimal clean sediment removal
2. Manual or mechanical (with UC approval) removal of oiled wrack
3. Manual removal of visible oil to coat[4] and thicker.
    a. Mechanical (with UC approval)
    b. High Pressure/Hot Water (with UC approval)
4. Removal of buried oil
    a. Sites will be surveyed by the digging of 1 foot deep pits at or near the last high tide (LHT) line and the inspection of that pit for tarballs or other oil contamination
    b. The inspection pits will be dug at an interval of 50 yards with a minimum of four pits.
    c. If oil is found, the extent of the oil burial will be delineated by the use of successive pits and marked.
    d. Test pits will be closed immediately after inspection.
    e. Buried oil will be removed with minimal clean sediment removal

Restrictions

1. Wrack that is NOT oiled should NOT be removed from the beach

D. Rip Rap Seawalls, Bulkheads, Piers, Docks and Pilings

Completion Recommendations

1. No sheen
2. Oil does not come off on the finger when touched

Methods Available

1. Manual removal of all visible oil, coat and thicker.
    f. Mechanical (with UC approval)
    g. High Pressure/Hot Water (with UC approval)
2. Manual removal of oiled wrack.

Restrictions

1. Wrack that is NOT oiled should NOT be removed.
2. Chemicals (AKA: shoreline cleaners) may not be used without UC approval.
3. Efforts must be taken to minimize recontamination of unoiled intertidal areas.
4. Capture of released oil.

E. Rocky Shorelines

Completion Recommendations

1. No sheen
2. Oil does not come off on the finger touched

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[3] ibid.

[4] "Coat: (visible oil <0.1 cm [and >0.01 cm] which can be scratched off with fingernail" Shoreline Assessment Manual," NOAA HAZMAT Report No. 2000-1. August 2000.

Methods Available

1. Manual removal of all visible oil, coat and thicker.
    a. Manual
    b. High Pressure/Hot Water (with UC approval)
2. Manual removal of oiled wrack

Restrictions

1. Wrack that is NOT oiled should NOT be removed.
2. Chemicals (AKA: shoreline cleaners) may not be used without UC approval
3. Efforts must be taken to minimize recontamination of unoiled intertidal areas.
4. Capture of released oil

F. Salt Marshes

Completion Recommendations

1. No sheen

Methods Available

1. Remove patches of pooled oil or mousse only under the direct supervision of on-site Environmental Unit personnel and with consultation with the Unified Command.
2. Manual removal of oiled wrack.

Restrictions

1. All removal activity and any activity within a salt marsh (oiled or not) will be under the direct, on-site supervision of Environmental Personnel.
2. Efforts must be taken to minimized disturbance of oiled and unoiled sediments and vegetation
3. As practical and possible floating oil and sheens should be recovered
4. No sediment will be removed without Unified Command approval.
5. No attached vegetation will be removed without Unified Command approval.
6. No vegetation will be cut without Unified Command approval.

Section Two

Treatment Procedures for Roseate Tern Habitat

(In particular: Ram Island, Bird Island, Penikese Island)

Objective: To eliminate oil contact risk to endangered roseate terns using the above islands and other suitable habitats, to the maximum extent possible, as rapidly as possible.

Completion Recommendations

1. No sheen.
2. Residual surface oil on rocky surfaces exposed at low tide does not come off on the finger when touched.
3. Intertidal vegetation and associated sediments are free of mobile oil
4. Intertidal vegetation and associated sediments do not provide a ready source of oil contamination to birds. Measurement methods to include hand wiping with sorbent pad, and other surrogates.

Expanded list of Approved Cleanup Techniques
(select most effective/most rapid/least intrusive method)

Oiled vegetation:

• Raking (with garden rakes) to remove oiled vegetation and oil on sand surface (taking care to minimize removal of grass roots)

• Cutting to remove attached oiled vegetation (taking care to minimize removal of roots)

• Application of peat or cellulose-type sorbent material to pooled oil and oiled vegetation mats to facilitate oil removal and to serve as contact barrier to birds. As practical, peat (or other organic distributed sorbent materials) placed within the intertidal zone should be removed prior to the next high tide to avoid potential re-distribution of oil.

Oiled Rocks

• Manual cleaning with sorbent materials, including peat or cellulose sorbents, to remove oil and to form a contact barrier to birds. (Suggest considering use of wire brushes or other scouring tools in conjunction with particulate sorbents to enhance oil removal). Oiled natural sorbent material should be collected to the extent practical.

• Flushing with ambient seawater to help mobilize oil for recovery with sorbents

• After gross oil removal, treatment of rocks with torch burners to accelerate oil weathering and reduce stickiness

• After gross removal, application of high-pressure and/or hot-water washing to remove remaining sticky oil. Mobilized oil to be collected with sorbent (snare etc.)

General good practices:
Minimize worker traffic over and through oiled areas (grass mats) to avoid spreading oil into unoiled areas. Use boards as walking surface (and/or sorbent runners), as necessary.

Section Three

Piping Plover Habitat

Piping Plover Beach Cleanup Procedures[5]

Cleanup procedures for beaches used by piping plovers, a federally listed threatened species, are not prescriptive. Each case will be dealt with on a case-by-case basis based on the specifics of the shoreline oiling, plover location, nesting status, and tolerance for disturbance. Generally, lower levels of activity in the vicinity of nesting plovers is preferable. Balancing rapid cleanup operations with need for limited disturbance of birds is a situation best handled by a single shorebird monitor with knowledge of the site and site cleanup supervisor.

Procedures for cleanup coordination on Plover beaches

1. Shorebird monitors may contact cleanup division supervisors for their associated monitoring areas each morning at approximately 6:30 am (see attached sheet for contacts and areas).
2. Monitors will check in with cleanup division supervisors at division tents when reporting to an area.
3. Cleanup division supervisors and shorebird monitors should discuss planned operations on the site and determine specific areas where operations may affect plovers, and possible actions to reduce this.
4. Minor adjustments to operations based on this observer input to cleanup division supervisor should be made based on this field contact.
5. Any input from observers that would require major adjustments to field operations should be raised to the Wildlife Branch Director {Tom O'Shea, Mass Div. Of Fisheries and Wildlife, 617-875-5376 or Susan Lingenfelser} for resolution with Unified Command.

Immediate Response Action Decision Points[6]

Given the sensitive nature of the piping plover, (a state and federally listed threatened species) treatment and assessment criteria may differ from beaches of similar sediment type, but different use (e.g.: recreational, bathing). The following are Immediate Response Action decision points for piping plover beaches:

1. All surface oil will be removed under the surveillance of shorebird monitors identified by the Wildlife Unit and in this document.
2. Division supervisors will consult with shorebird monitors in the manner described above.
3. Shoreline Cleanup Assessment Teams (SCAT) will survey piping plover beaches (contiguous intertidal zone only) for subsurface oil, prioritizing their surveys in the following manner, using attached USFWS/MDFW charts:

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[5] Procedures developed with cooperation and consultation of Tom O'Shea Mass Div. Fisheries and Wildlife and Wildlife Recovery Group Leader, Scott Melvin, Mass Div. Fisheries and Wildlife Susan Lingenfelser/USFWS, Scott Lundgren/USCG, Don Jensen/R.P.

[6] These decision points were developed with the cooperation of Tom O'Shea (MDFW), Susan Lingenfelser (USFWS), Susi von Oettingen (USFWS), Varela Veronica (USFWS) –May 08, 2003

a. Beaches known to have the highest concentration of piping plovers (USFWS)
b. Beaches having fewer piping plovers, but known to have plovers (USFWS)
c. Recognized (by USFWS or MDFW) piping plover habitat within the oil spill impact region, regardless of known occupation by birds at this time.

4. Identification of buried oil
   a. Sites will be surveyed by the digging of 1 foot deep pits at or near the last high tide line and the pit will be inspected for tarballs or other oil contamination
   b. The inspection pits will be dug at an interval of 50 yards with a minimum of four pits per beach section.
   c. If oil is found, the extent of the oil burial will be delineated by the use of successive pits, marked and recorded.
   d. Test pits will will be closed immediately after inspection.
5. Removal of buried oil (requires monitoring procedures as outlined above)
   a. Buried oil in concentrations of "Oil Residue"[7] or greater will be removed manually with the consultation of the shorebird monitor. Every attempt should be made by the R.P. to provide advance notice to monitors in order to arrange for a site visit and monitoring activities. In as much as practical, un-oiled sediments will not be removed from the site. All holes will be filled in.
   b. If, in the opinion of the shorebird monitor, the existing piping plovers appear to be stressed or disturbed by this cleanup activity, the division supervisor will cease the operation, fill any open holes, record the location and proceed to other scheduled activities. At this time, the buried oil will be deemed unrecoverable while the piping plovers are present.
   c. Sections of beach deemed to have "unrecoverable" buried oil will continue to meet the highest standard (no visible oil) for surface oiling (or re-oiling), but will not be excavated, mechanically or manually, throughout the piping plovers residence period. Following the out migration of the piping plover in the autumn of 2003, the beaches will be re-surveyed for buried oil in the manner described above. If buried oil is found to exist, a plan will be developed by the Unified Command, based on the degree of oiling and the physical state of the buried oil to address the issue. If "unrecoverable" buried oil rests on Horseneck Beach, cleanup activities must be closely coordinated with FWS and MDFW personnel, in order to ensure the protection of the federally endangered northeastern beech tiger beetle and other State listed invertebrate species.

[7] "Oil Residue: sediments are visibly oiled with black/brown coat or cover on the clasts, but little or no accumulation of oil within the pore spaces." NOAA HAZMAT Report No. 2000-1. August 2000.

Division	*Geographic Location*	*Division Supervisor & phone number*	*Shorebird Monitor*
WEST DIVISIONS	Rhode Island to Stony Dike	Bill Neubrand, Supervisor of West Divisions 781-706-2716 410-935-9453	
W3E	Rhode Island to Stony Dike	Walter Janicek 781-706-2758	Marie Winston RI TNC 401-333-7110
W3D	South Shore Point to Horseneck Point (Bar Rock)	Gary Johnson 781-706-2786	Marie Winton, RI TNC, 401-333-7110
W3C	Horseneck Beach to Demerest Lloyd State Park, EXCLUDING Barney's Joy and Little Beach.	Ken Irving 571-283-2580	Gina Purtell, MA Audubon, 508-636-2437 and Jamie Bogart Lloyd Center, 508-990-0505 x23
W3C	Barney's Joy and Little Beach	Ken Irving 571-283-2580	Gina Purtell, MA Audubon, 508-636-2437
W3B	Slocum's River to Mishaum Point	Walter Janicek 781-706-2758	[no plovers reported]
W3A	Mishaum Point to Round Hill	Walter Janicek 781-706-2758	Jamie Bogart, Lloyd Center, 508-990-0505 x23
W2B	Round Hill to New Bedford	Lionel Johnson 985-637-2097	Jamie Bogart, Lloyd Center, 508-990-0505 x23
W2A	Fairhaven (Sconticut Neck / West Island)	Lionel Johnson, 985-637-2097	Jamie Bogart, Lloyd Center, 508-990-0505 x23
W1F	Pine Island Pond	John Sweency	[no plovers reported]
W1E	Mattapoisett Harbor to Point Connett	Randy Henry 781-706-2709 409-626-2508	Matt Bailey, MA Audubon, 508-362-7475
W1B	Sippican Neck to Stony Point Dike	Jack Coyle 571-283-2574	Matt Bailey, MA Audubon, 508-362-7475
E1	Stony Point Dike to Herring Brook/Falmouth	Greg Yaroch 508-428-6962 781-706-2707	Matt Bailey, MA Audubon, 508-362-7475
E2	Herring Brook/Falmouth to Woods Hole	Greg Yaroch 508-428-6962 781-706-2707	Matt Bailey, MA Audubon, 508-362-7475
E3	Elizabethan Islands	Greg Yaroch 508-428-6962 781-706-2707	Trustees of Reservations, Martha's Vineyard

Beaches with Piping Plovers in Buzzards Bay

Bourne

Bassetts Island, Bourne
Mashnee Island/Rocky Pt Dike, Bourne, MA

Dartmouth

Little Beach/Barney's Joy, Buzzards Bay, Dartmouth, MA
Round Hill Pt, Dartmouth, MA
Bayview, Dartmouth, MA
Salters Pond, Dartmouth, MA
Demarest-Llyod Memorial State Park, Dartmouth, MA

Elizabeth Islands

Tarpulin Cove, Naushon Island, E Islands, Gosnold, MA
Jobs Neck, Naushon Island, E Islands, Gosnold, MA
Pasque Island, Elizabeth Islands, Gosnold, MA
Nashawena Island, East, Elizabeth Islands, MA
Copicut Neck, Cuttyhunk Island, Elizabeth Islands, MA
Canapitsit Channel, Nashawena Island, Elizabeth Islands, MA
Quicks Hole, Nashawena Island, Elizabeth Islands, MA
Robinsons Hole, Pasque Island, Elizabeth Islands, Gosnold, MA
Cuttyhunk, Cuttyhunk Island, Elizebeth Islands, Gosnold, MA

Fairhaven

Winsegansett Heights (Sconticut Neck – west marsh area), Fairhaven, MA
West Island, Nasketucket Bay, Fairhaven, MA

Falmouth

Washburn Island, Menauhant, Falmouth, MA
Strawberry Point, Mattapoisett, MA

Wareham

Onset Bay (Long Beach Pt. Little Harbor Beach), Great Neck, Wareham, MA
Stony Point Dike, Great Neck, Wareham, MA

Westport

Richmond Pond – beaches
Cockeast Pond – beaches
Horseneck Beach

Rhode Island

South Shore Point Beach

_____ Initial
Mary Landry
Captain, US Coast Guard
Federal On-Scene Coordinator (FOSC)

_____ Initial
Robert Donovan
Massachusetts Department of Environmental Protection
State On-Scene Coordinator (SOSC)

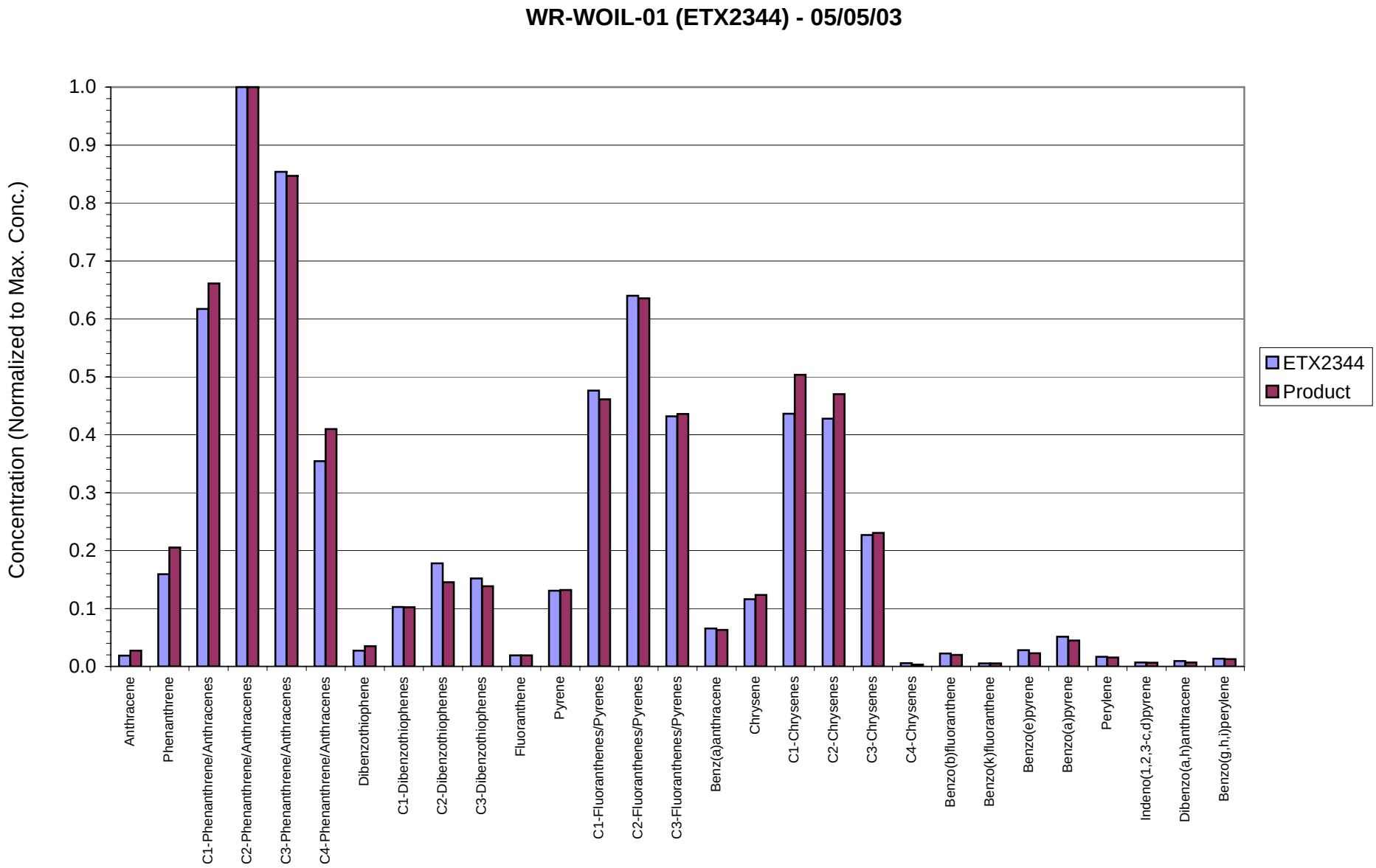
_____ Initial
Dave Barry
Bouchard Transportation Co., Inc.
Responsible Party (RP)

_____ Initial
Tom O'Shea
Division of Fisheries & Wildlife
State of Massachusetts

_____ Initial
Drew Major, Stan Skutek or Susan Lingenfelser
US Fish & Wildlife Service
designated Federal Response Coordinator

APPENDIX E

PAH FINGERPRINTS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C3-Dibenzothiophenes
Fluoranthene
Pyrene
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C3-Fluoranthenes/Pyrenes
Benz(a)anthracene
Chrysene
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C2-Chrysenes
C3-Chrysenes
C4-Chrysenes
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Benzo(k)fluoranthene
Benzo(e)pyrene
Benzo(a)pyrene
Perylene
Indeno(1,2,3-c,d)pyrene
Dibenzo(a,h)anthracene
Benzo(g,h,i)perylene

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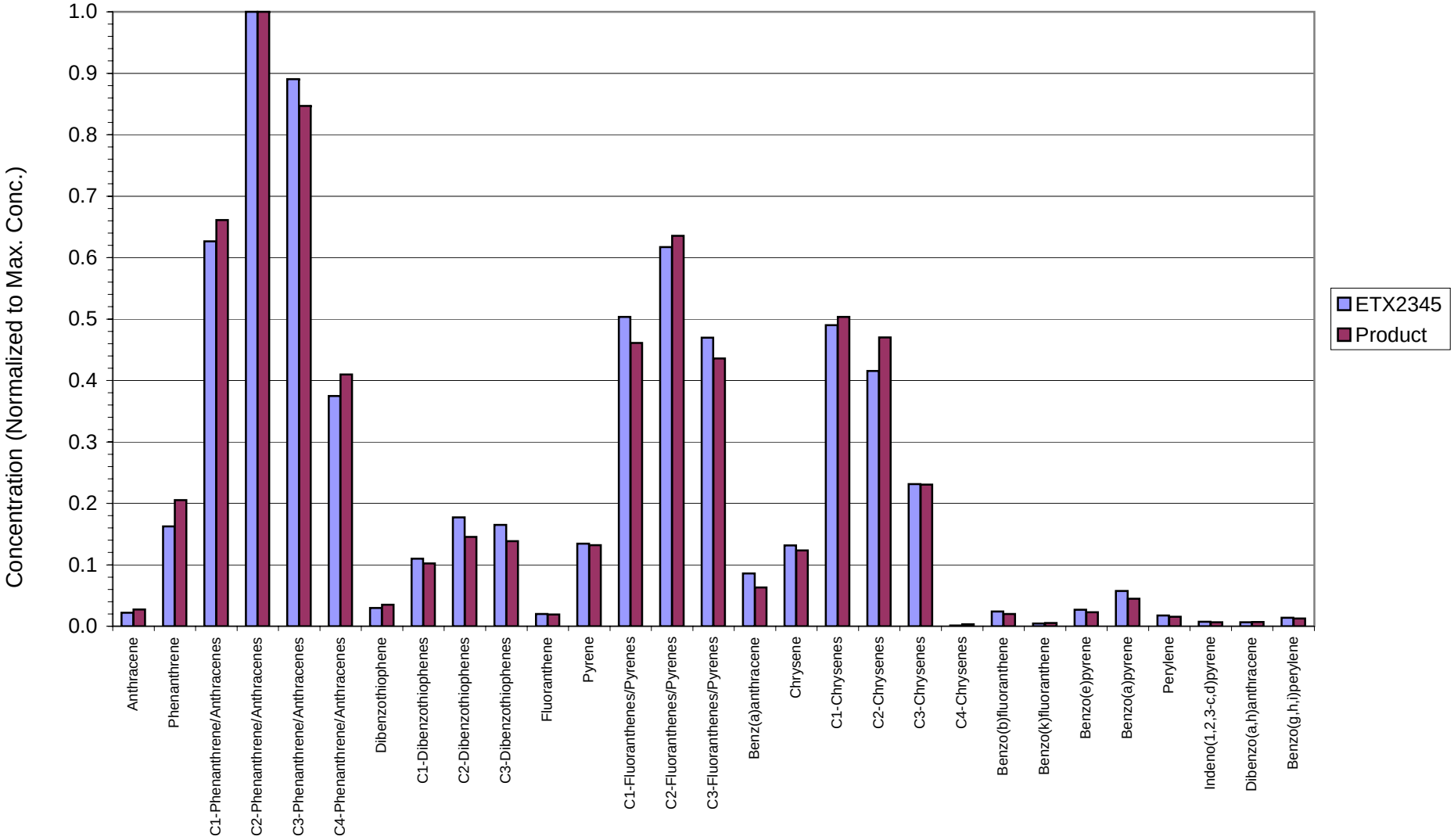

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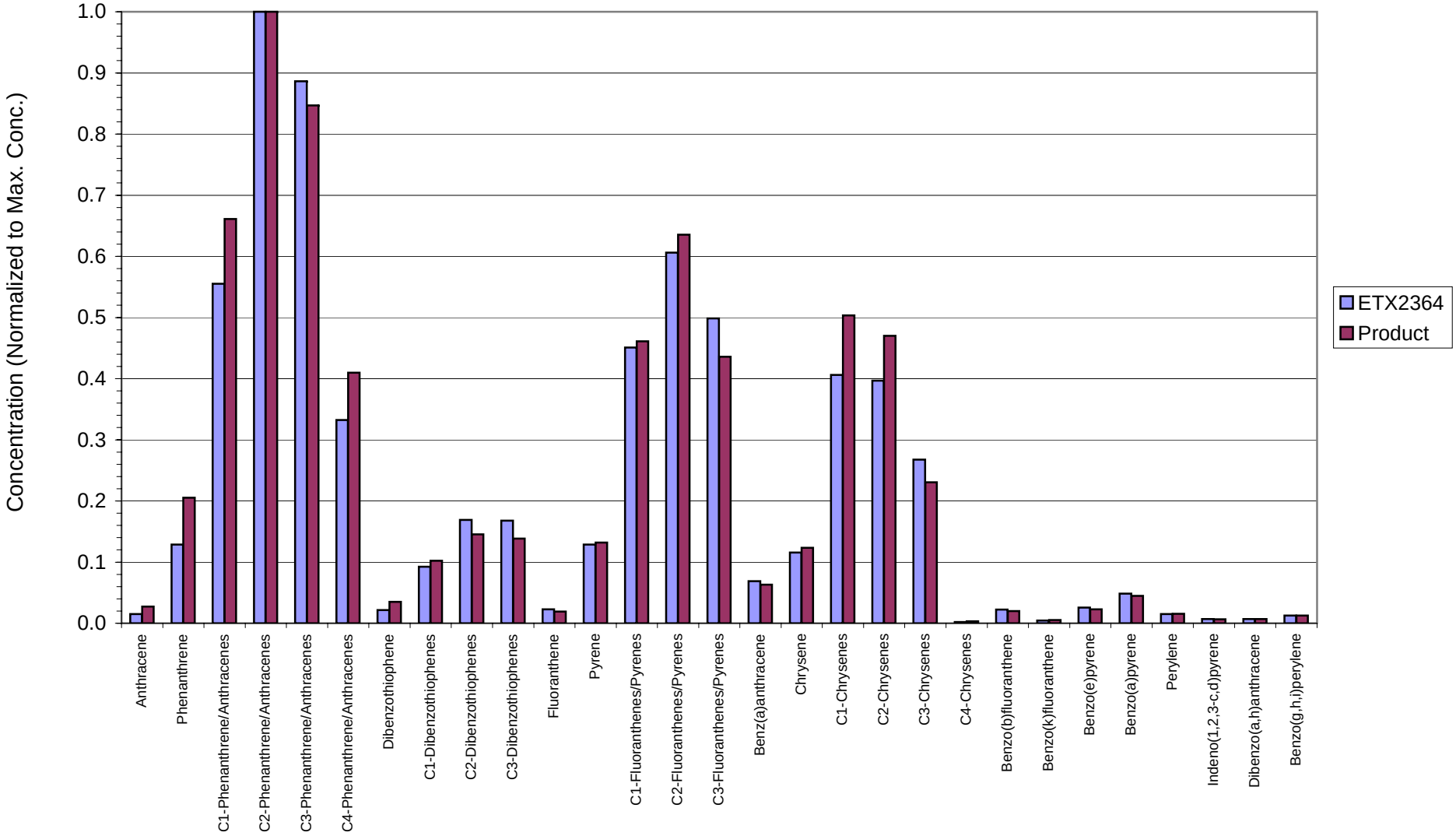

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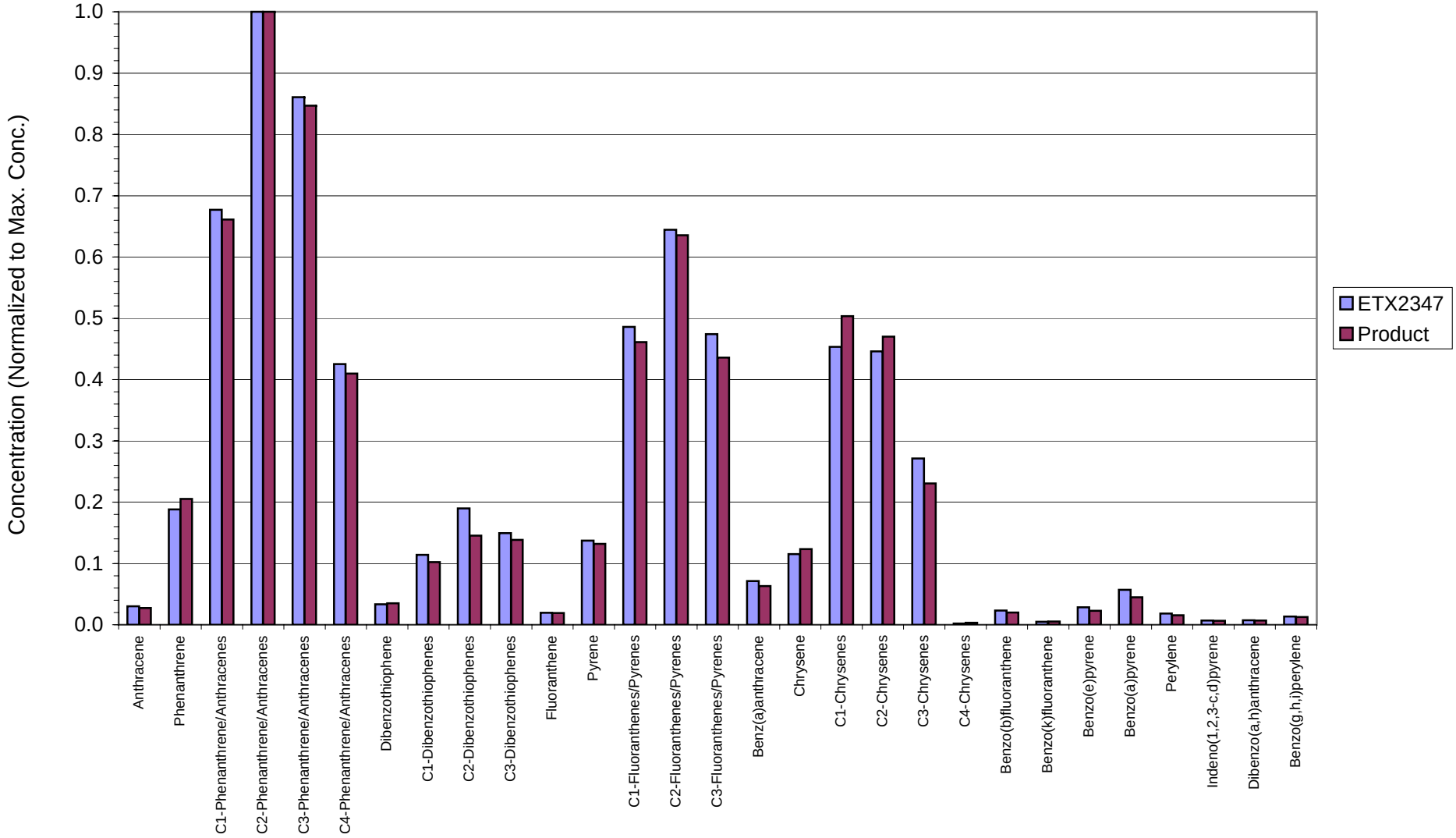

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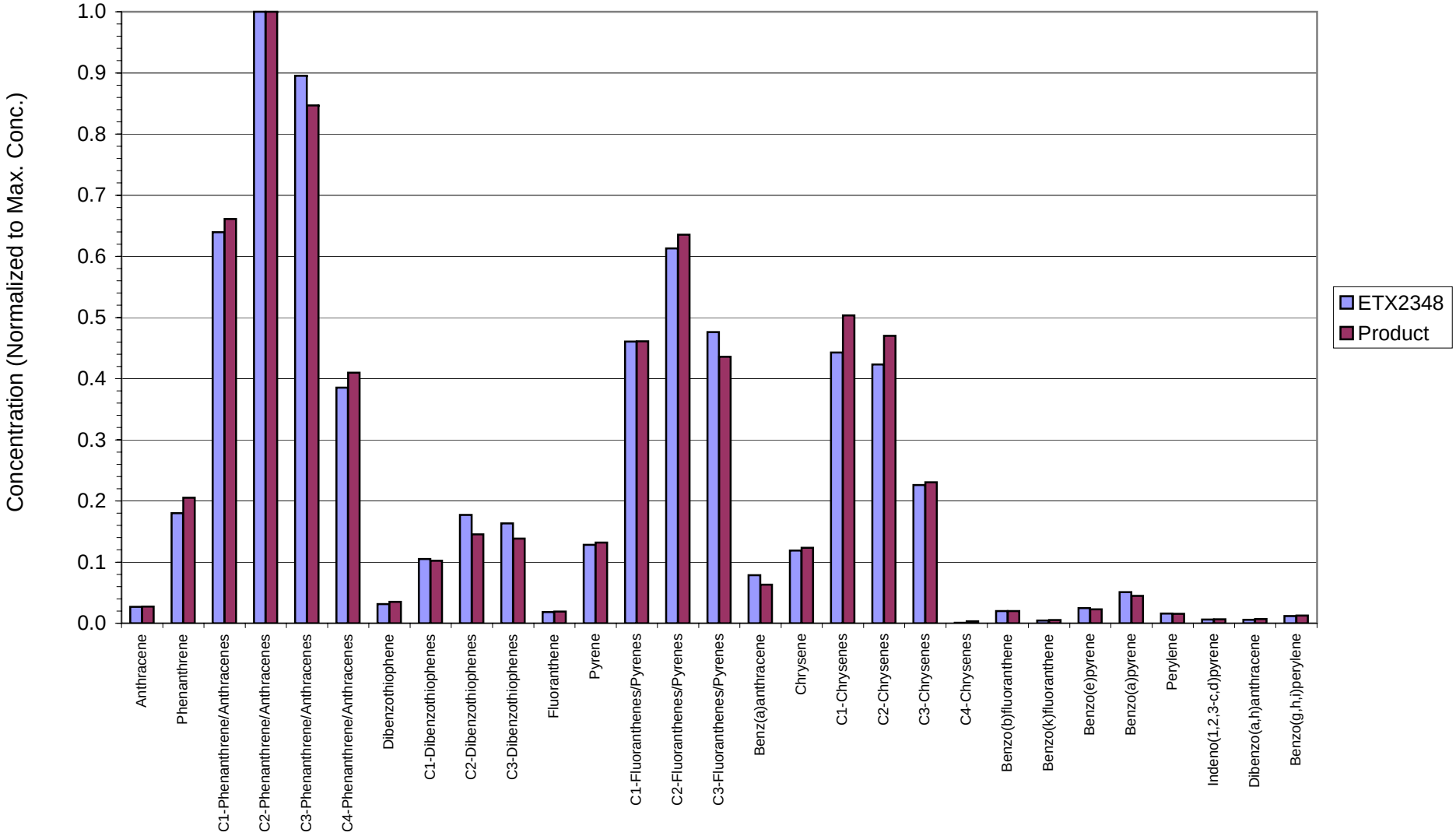

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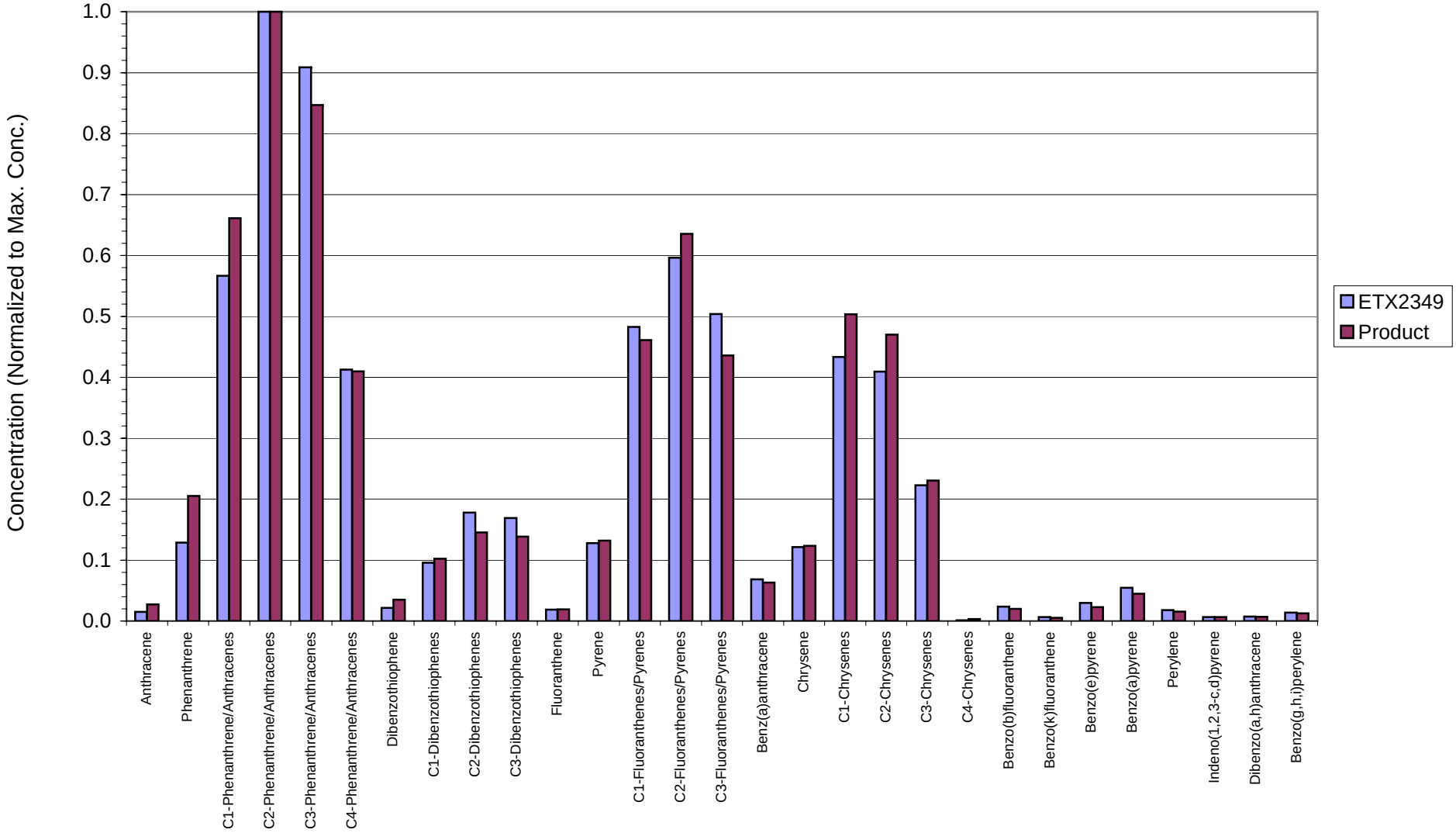

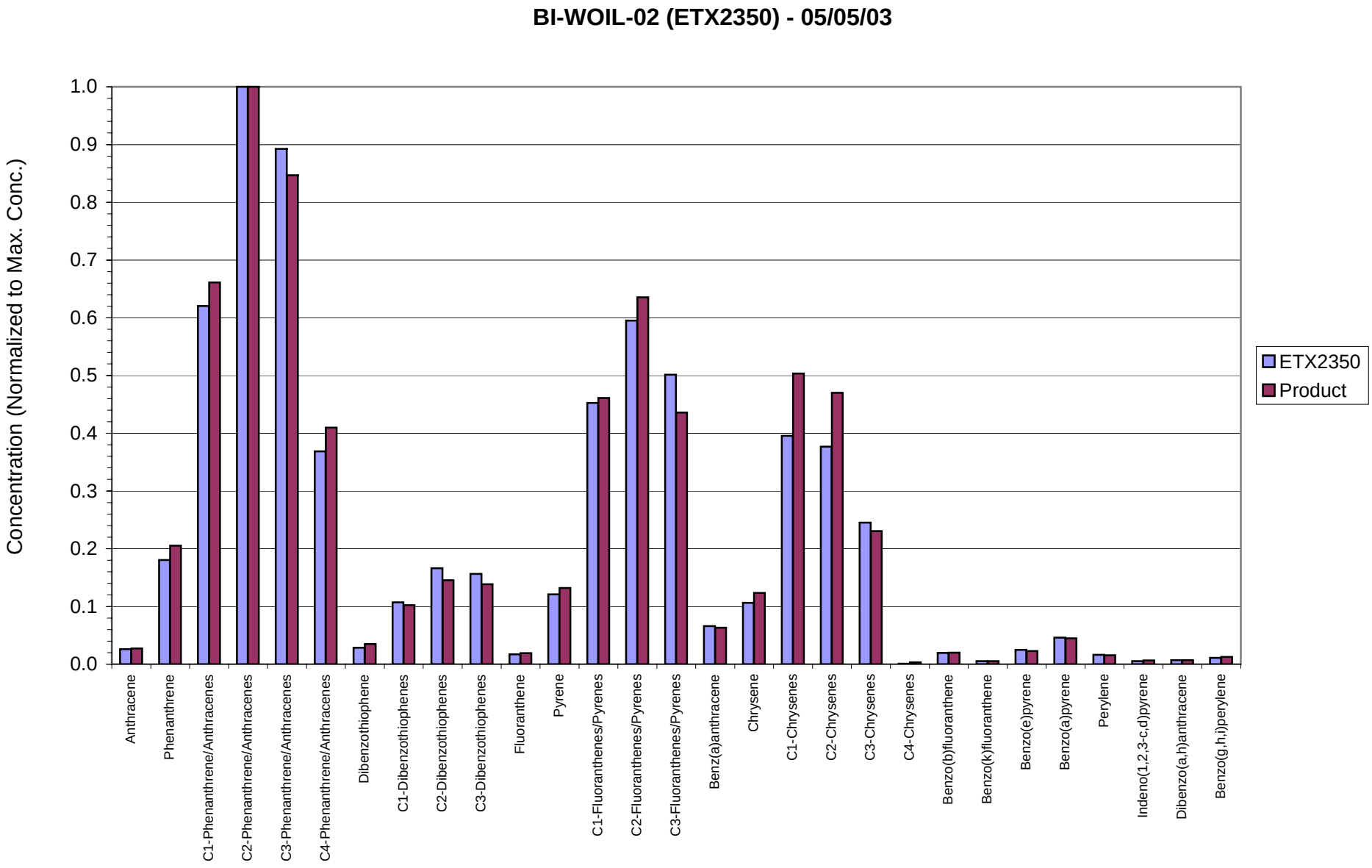
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Benzo(b)fluoranthene
Benzo(k)fluoranthene
Benzo(e)pyrene
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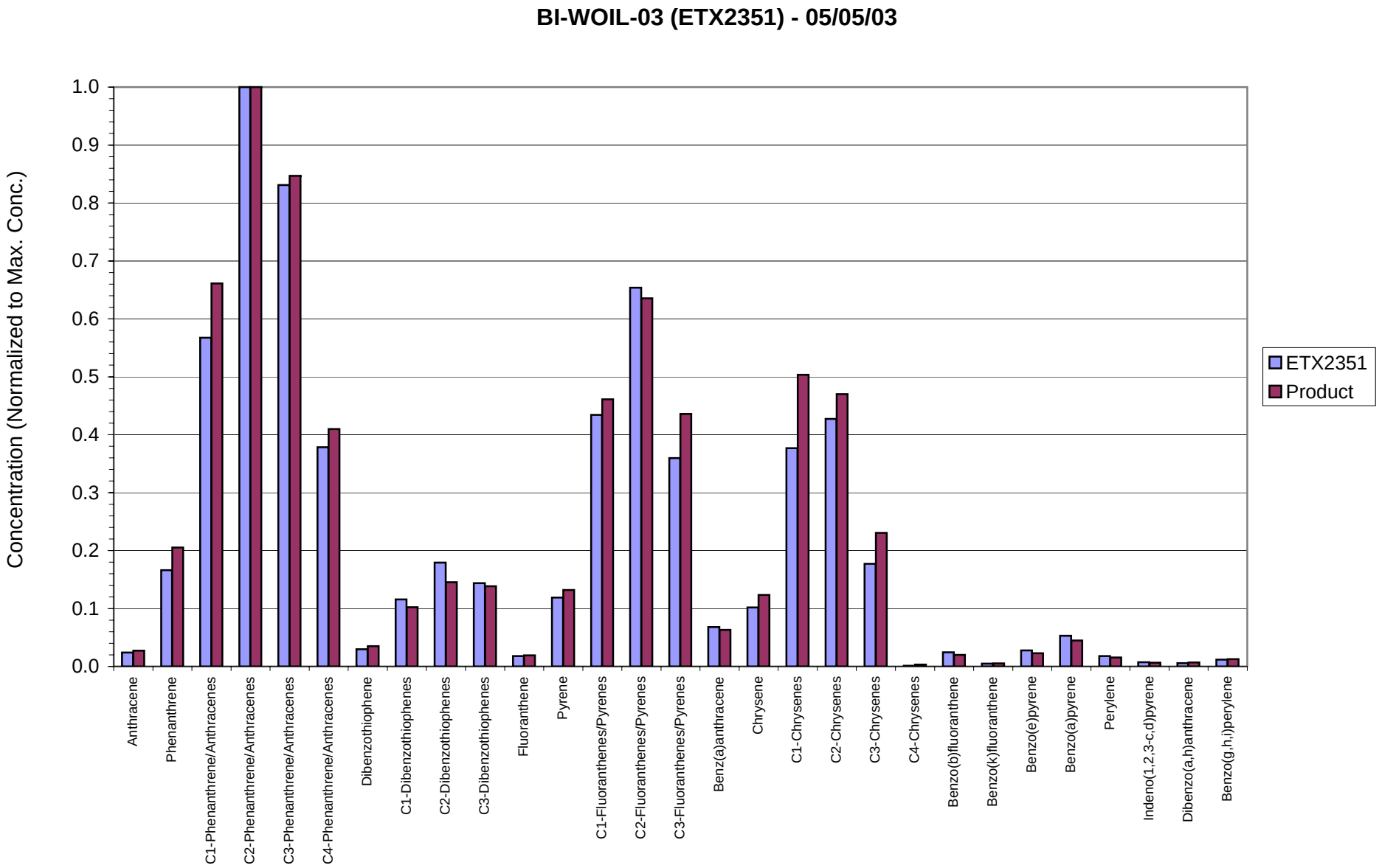
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Benzo(k)fluoranthene
Benzo(e)pyrene
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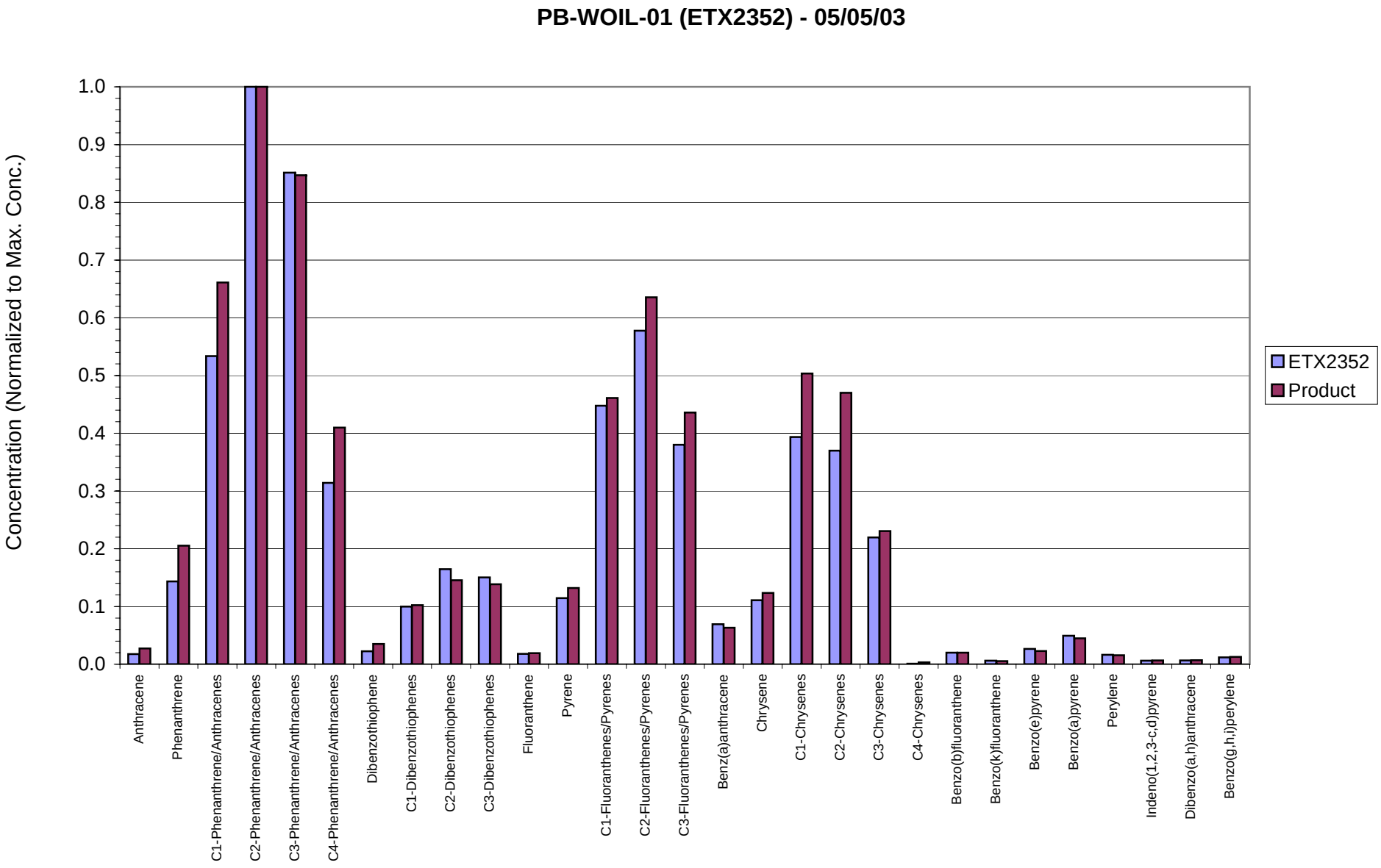
Benzo(g,h,i)perylene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C3-Dibenzothiophenes
Fluoranthene
Pyrene
C1-Fluoranthenes/Pyrenes
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C3-Fluoranthenes/Pyrenes
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C2-Chrysenes
C3-Chrysenes
C4-Chrysenes
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Benzo(e)pyrene
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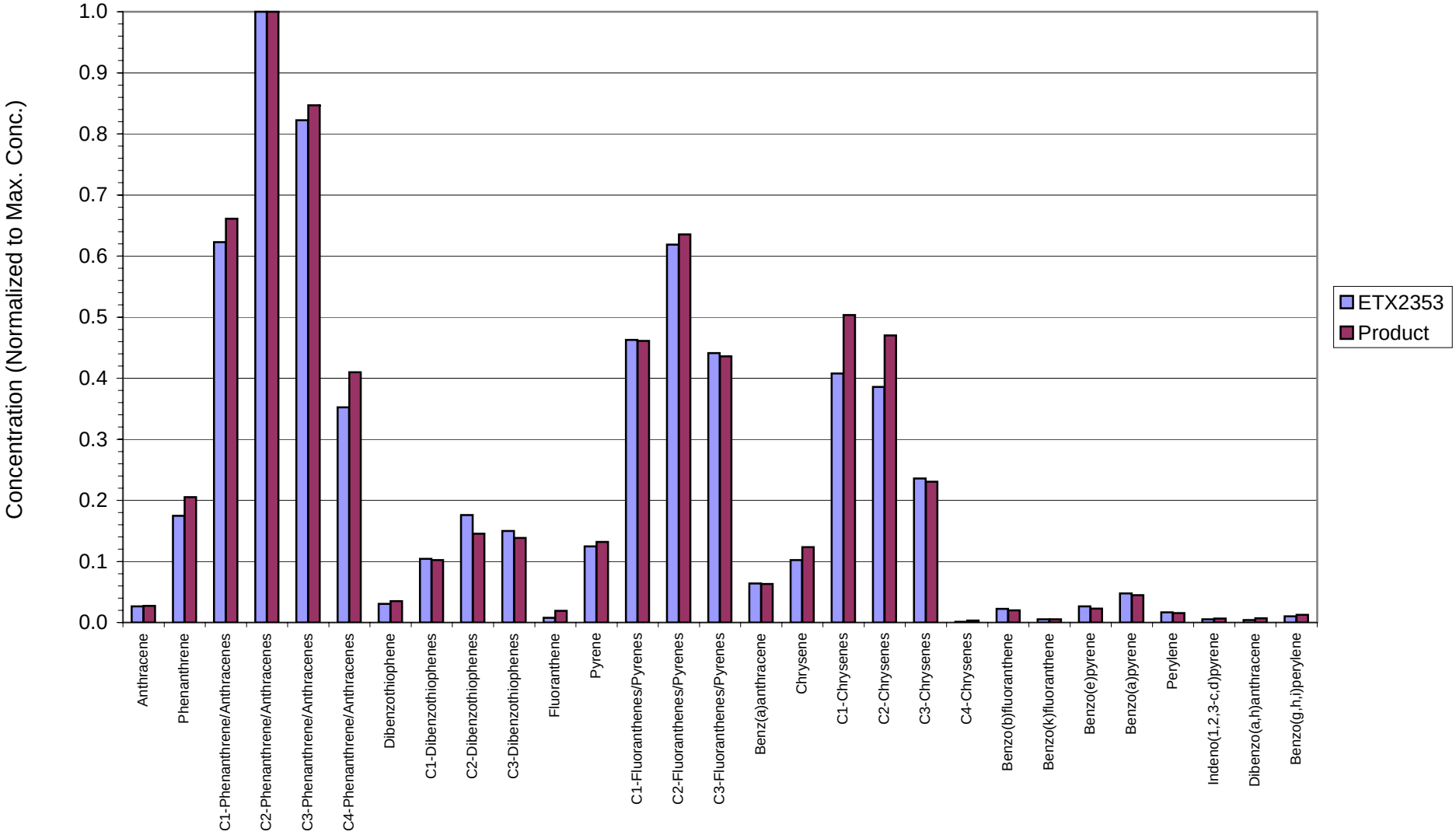

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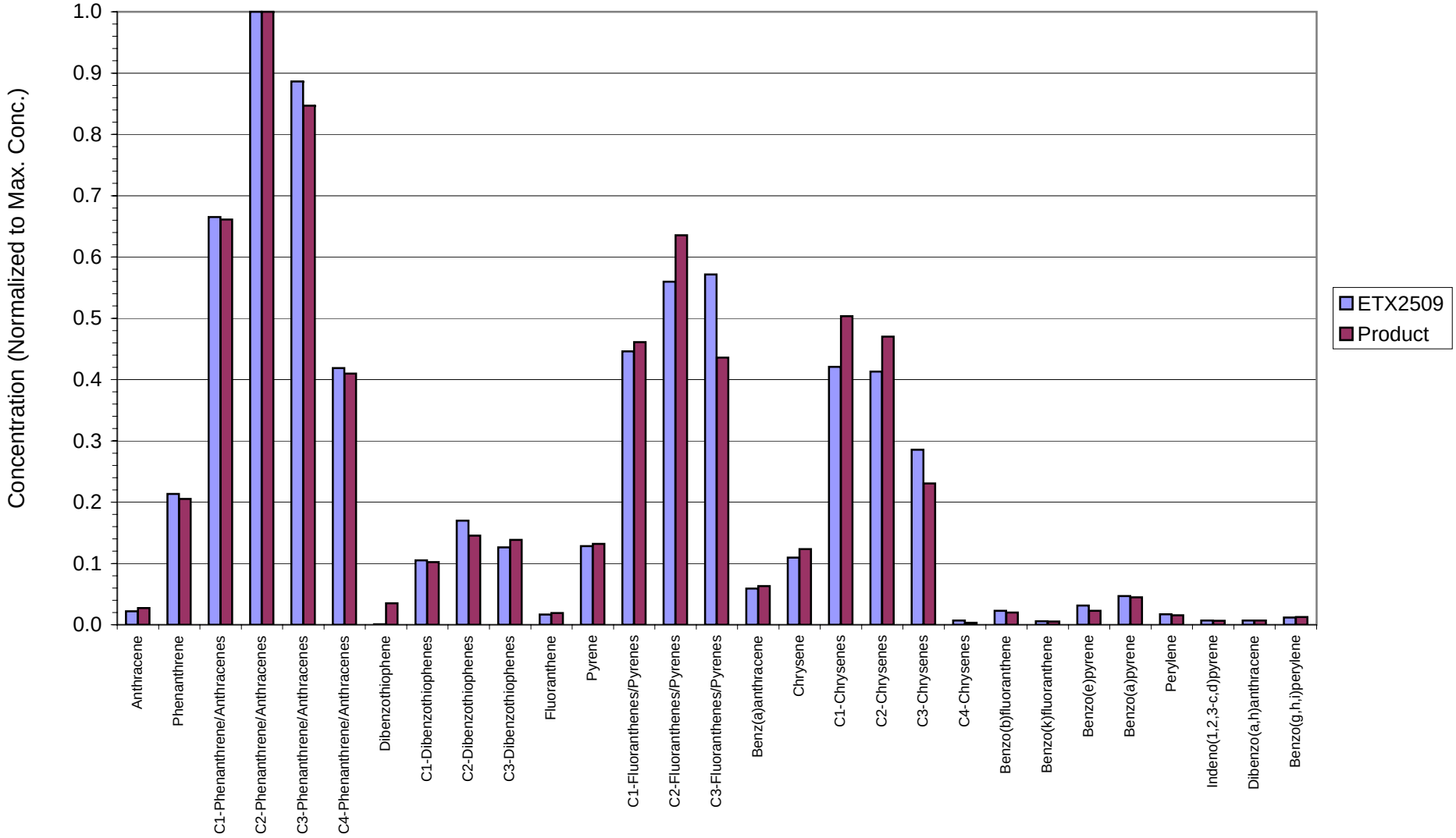

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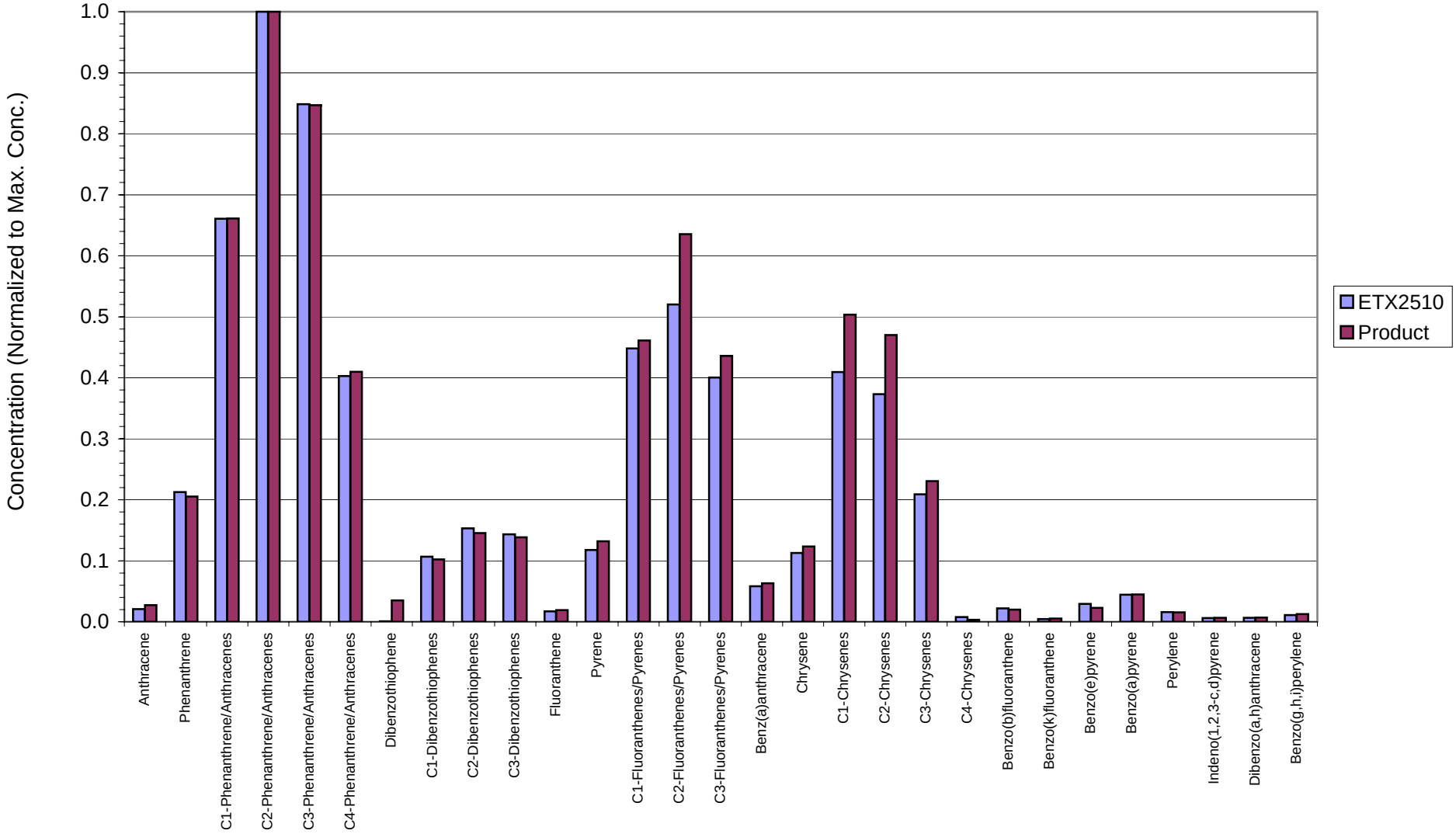

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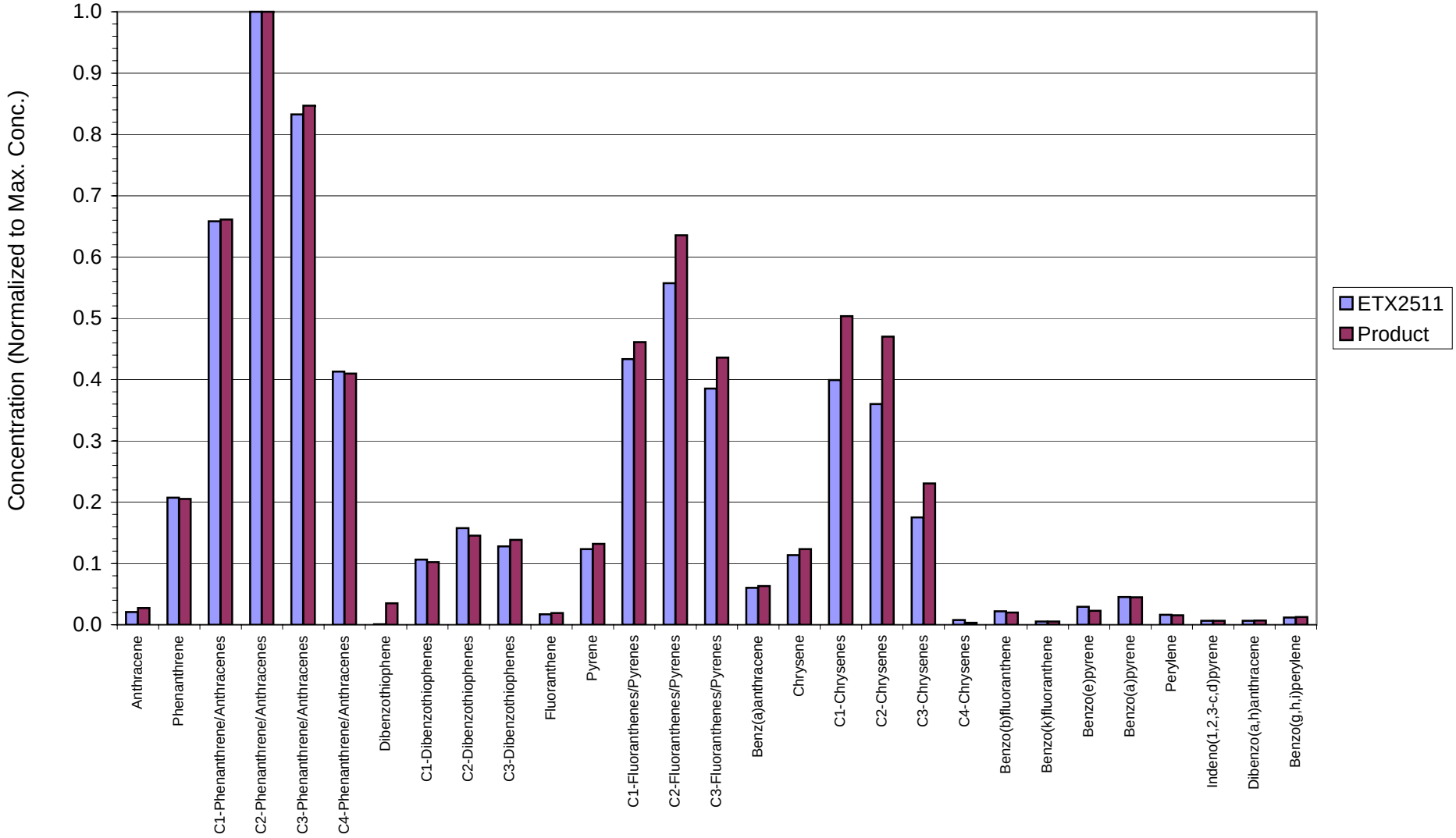

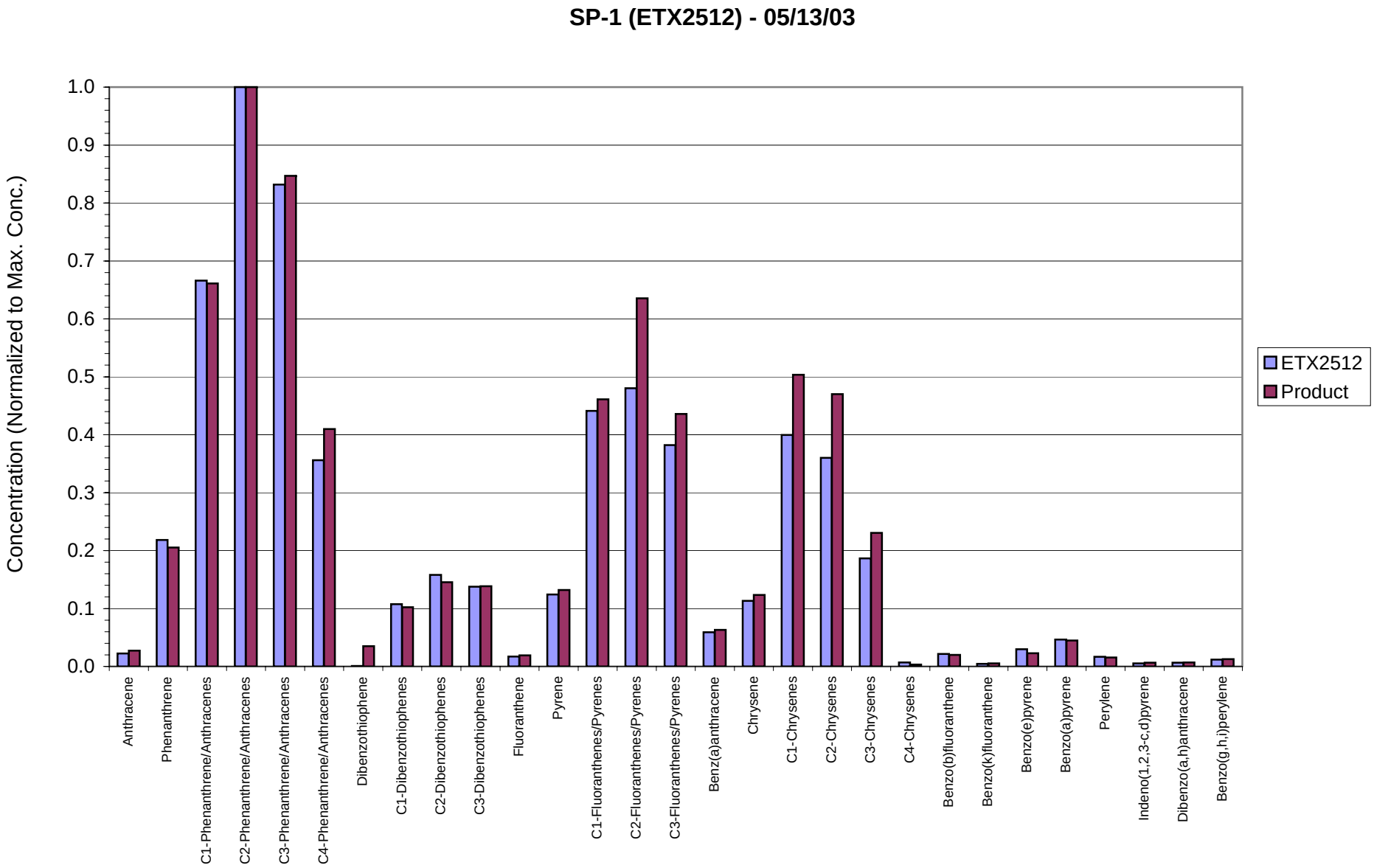
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C3-Phenanthrene/Anthracenes
C4-Phenanthrene/Anthracenes
Dibenzothiophene
C1-Dibenzothiophenes
C2-Dibenzothiophenes
C3-Dibenzothiophenes
Fluoranthene
Pyrene
C1-Fluoranthenes/Pyrenes
C2-Fluoranthenes/Pyrenes
C3-Fluoranthenes/Pyrenes
Benz(a)anthracene
Chrysene
C1-Chrysenes
C2-Chrysenes
C3-Chrysenes
C4-Chrysenes
Benzo(b)fluoranthene
Benzo(k)fluoranthene
Benzo(e)pyrene
Benzo(a)pyrene
Perylene
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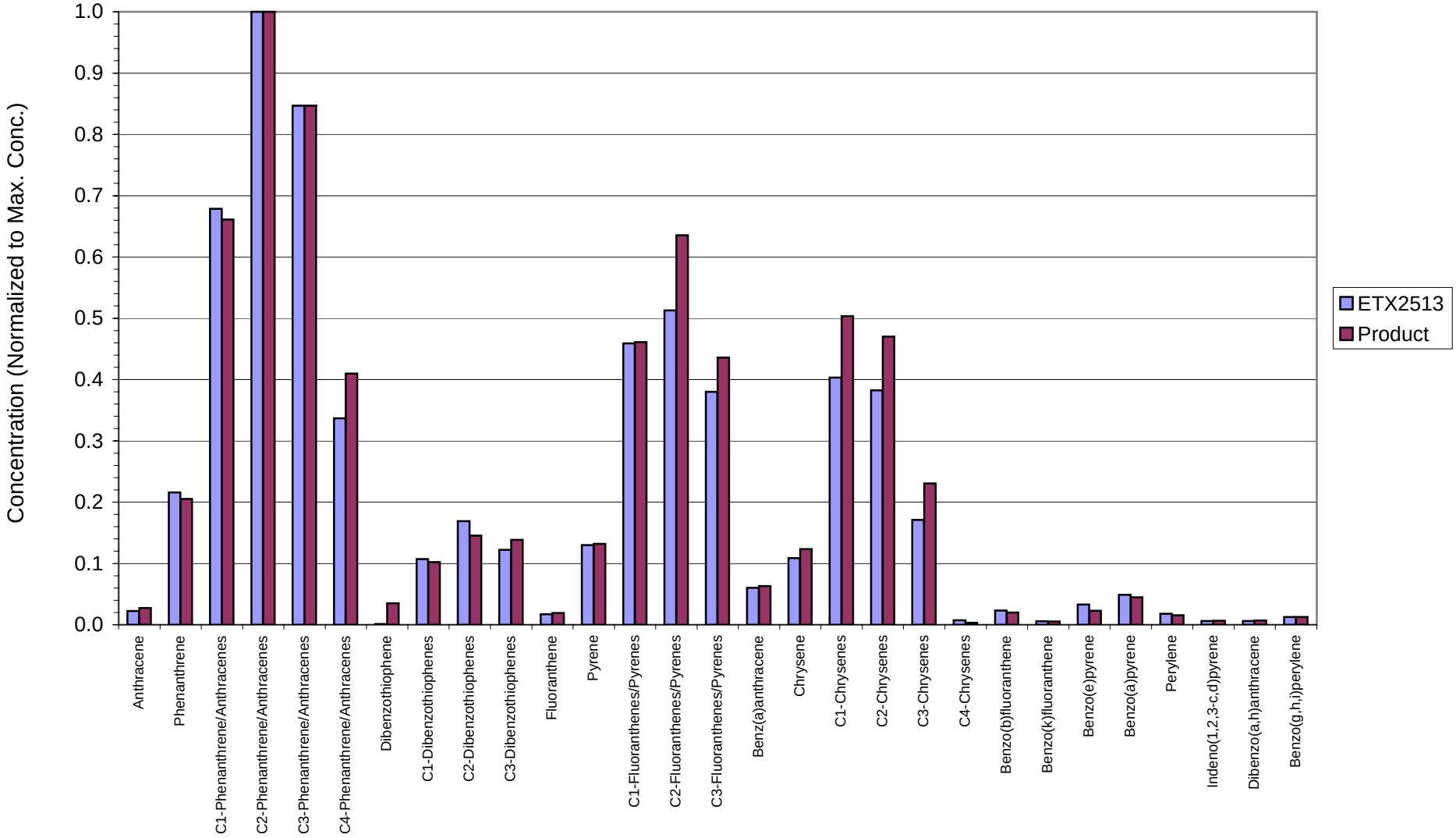

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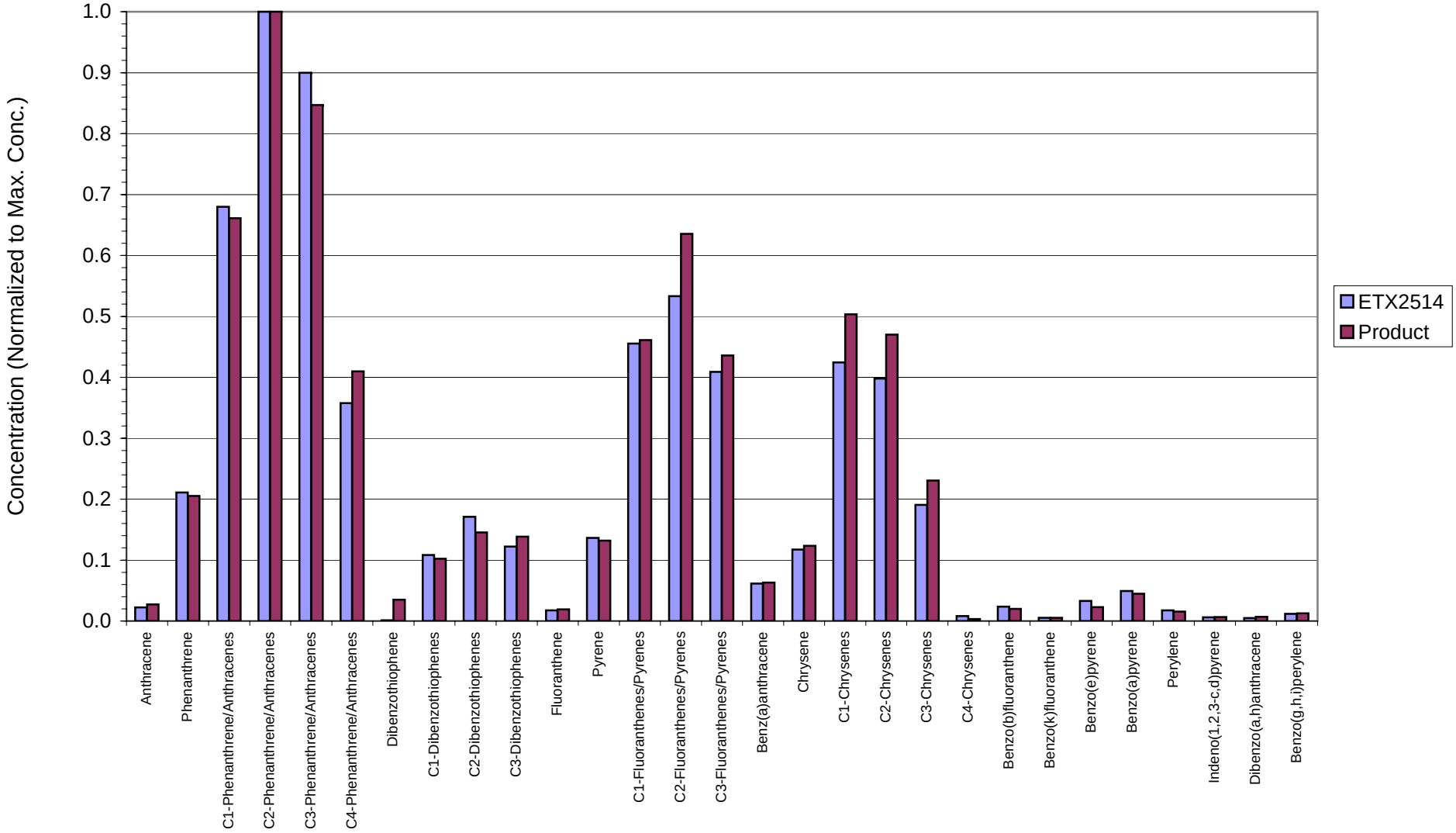

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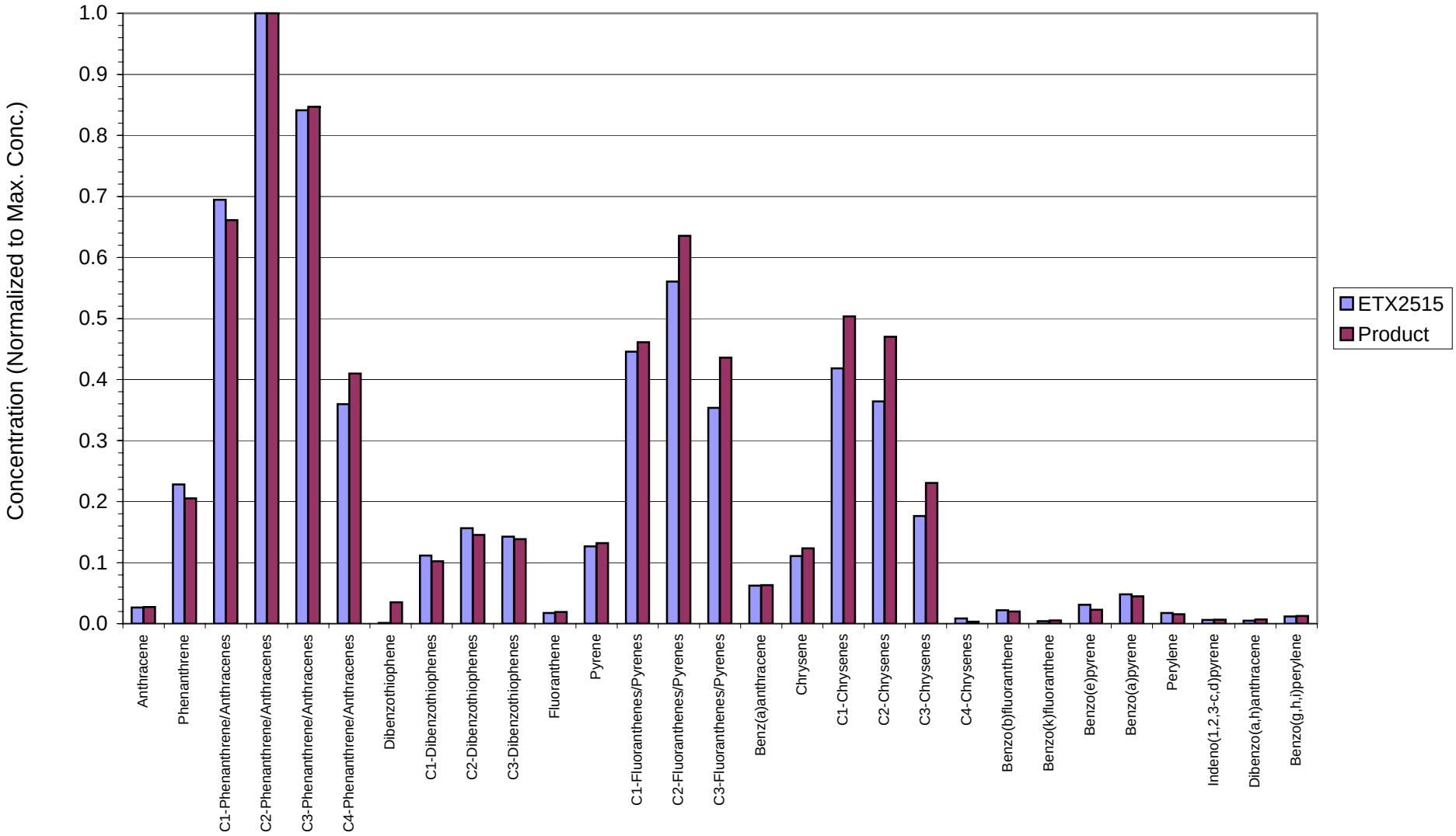

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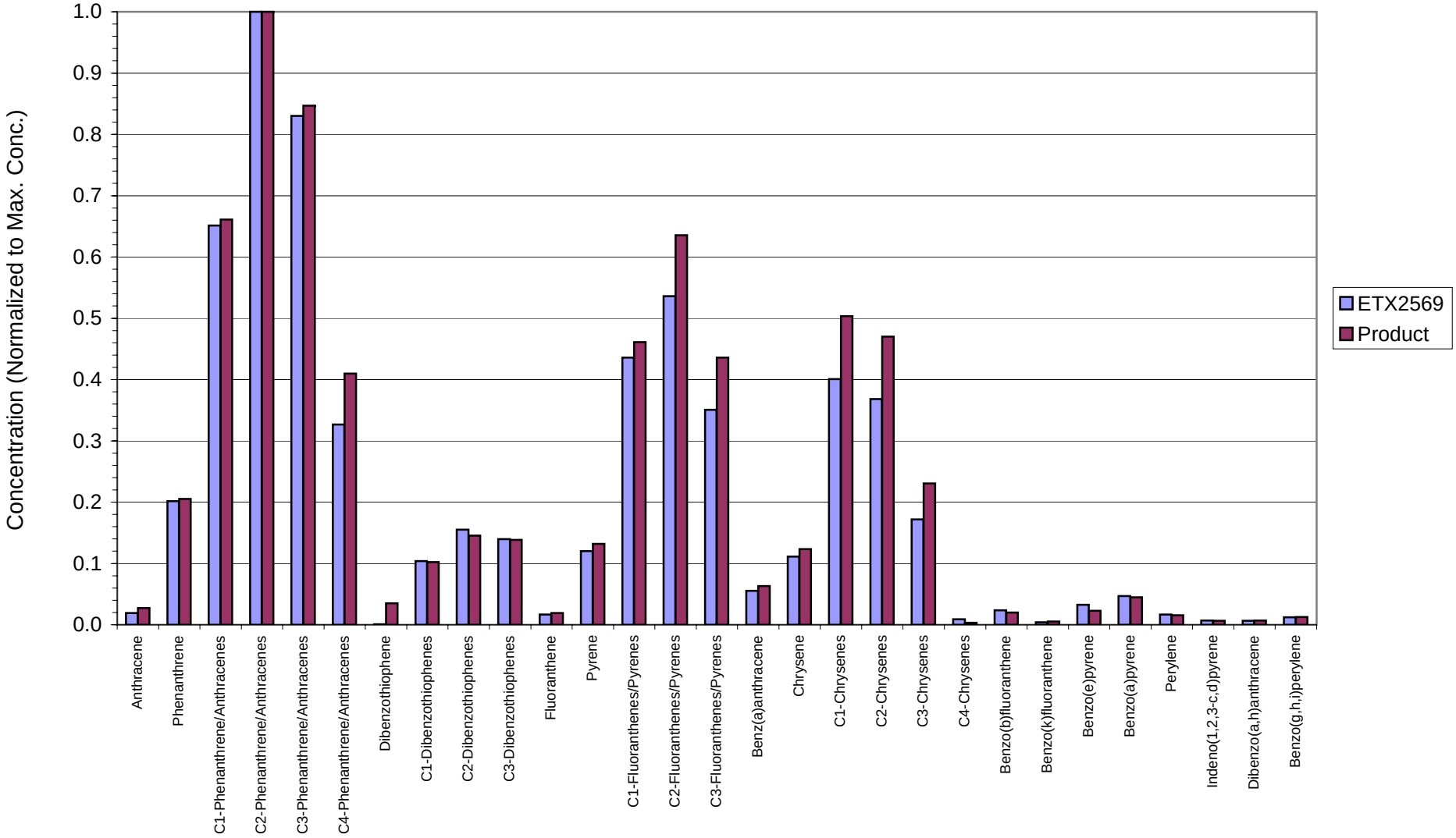

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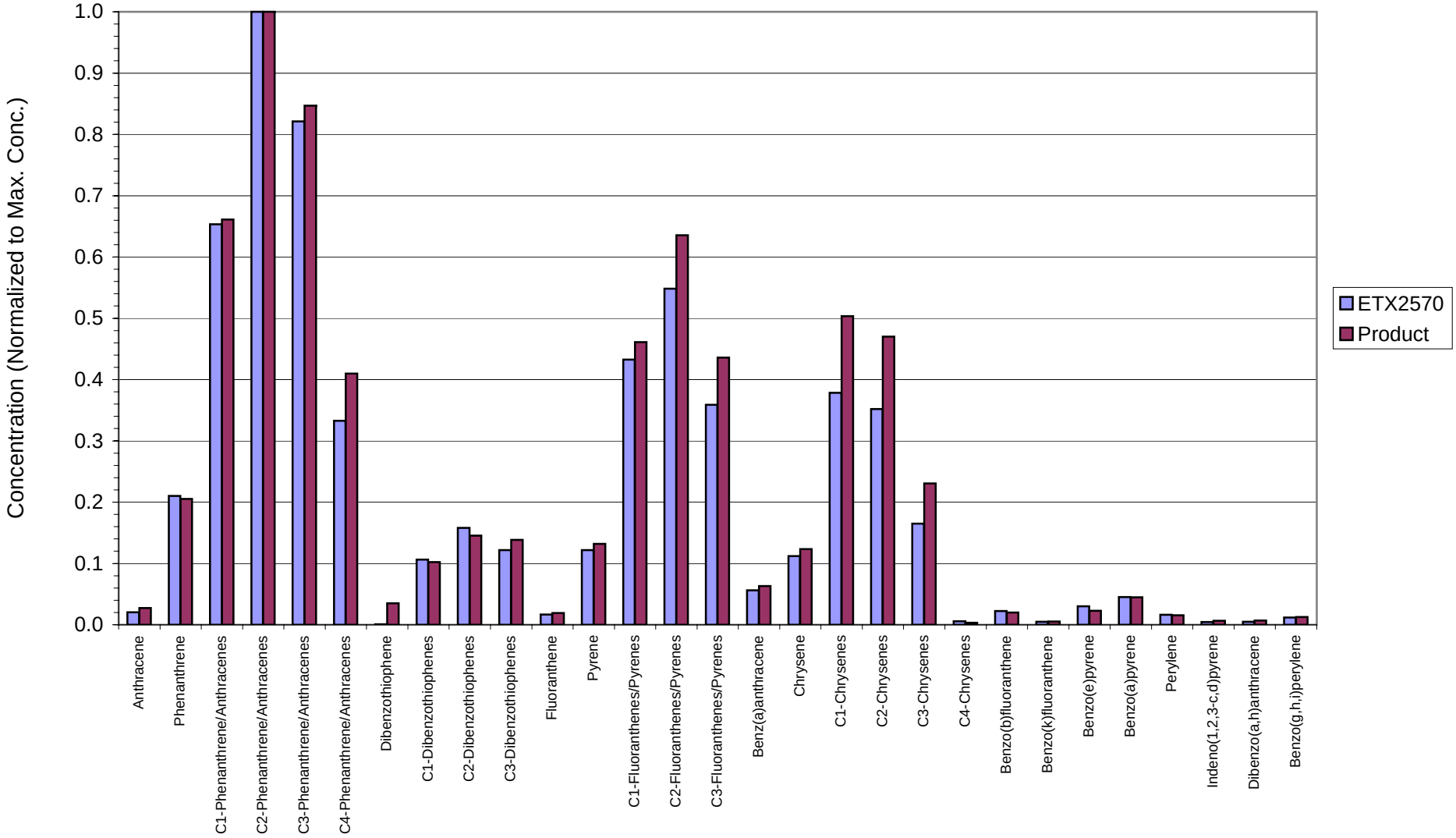

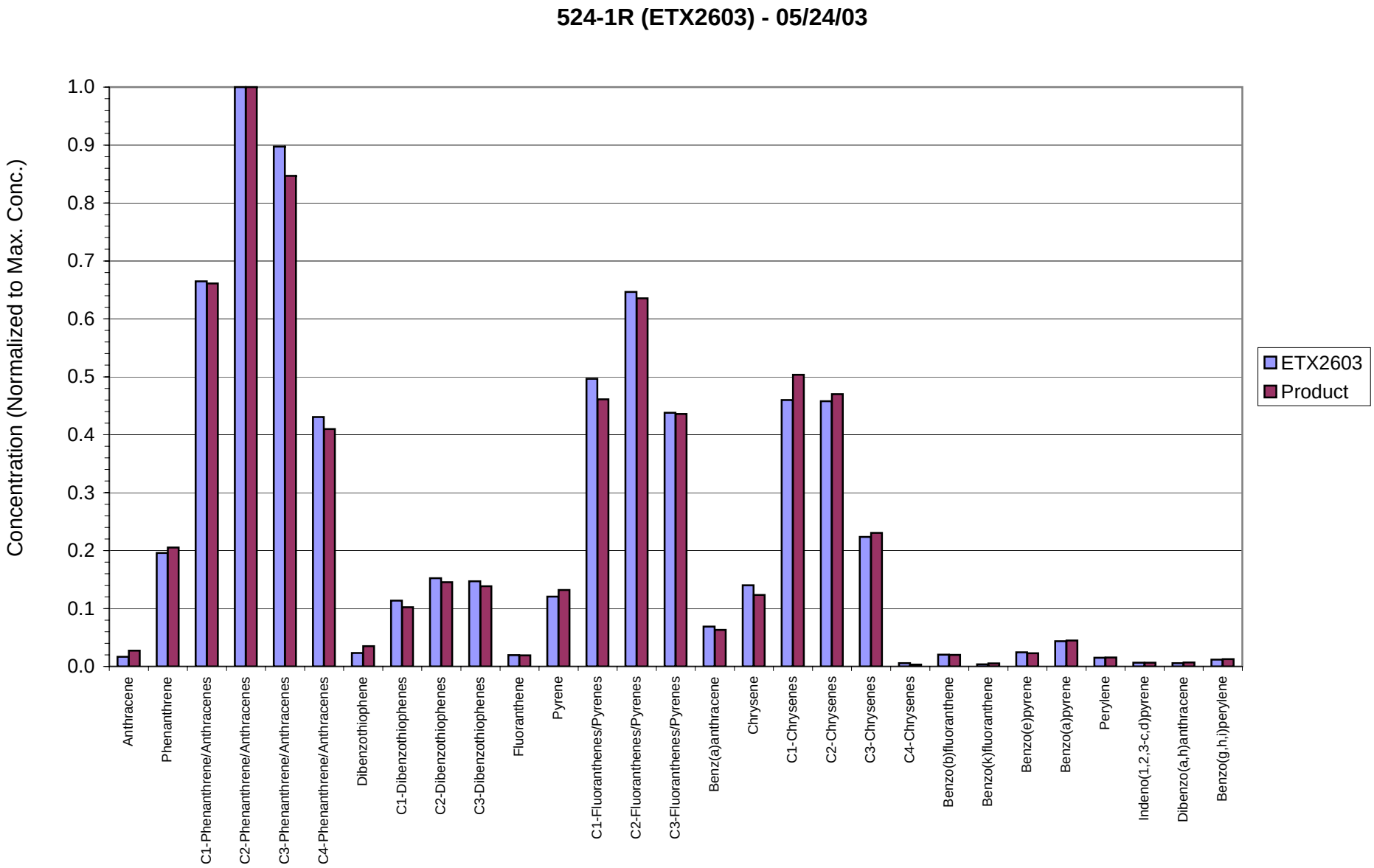
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0.3
0.2
0.1
0.0
ETX2603
Product
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Phenanthrene
C1-Phenanthrene/Anthracenes
C2-Phenanthrene/Anthracenes
C3-Phenanthrene/Anthracenes
C4-Phenanthrene/Anthracenes
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C2-Dibenzothiophenes
C3-Dibenzothiophenes
Fluoranthene
Pyrene
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C2-Chrysenes
C3-Chrysenes
C4-Chrysenes
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Benzo(k)fluoranthene
Benzo(e)pyrene
Benzo(a)pyrene
Perylene
Indeno(1,2,3-c,d)pyrene
Dibenzo(a,h)anthracene
Benzo(g,h,i)perylene

APPENDIX F

WILDLIFE OVERFLIGHT REPORT AND AMERICAN OYSTERCATCHER SURVEY REPORT

AMERICAN OYSTERCATCHERS IN THE BUZZARDS BAY AREA

Survey Summary Report

May – June 2003

PREPARED FOR

INDUSTRIAL ECONOMICS, INC.
2067 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02140

PREPARED BY

WOODLOT ALTERNATIVES, INC.
30 PARK DRIVE
TOPSHAM, ME 04086

SUBMITTED JUNE 23, 2004

TABLE OF CONTENTS

APPENDICES

Cover Photo by Woodlot Alternatives, Inc. 2003.

1.0 INTRODUCTION

The purpose of this project was to document the occurrence of oiled American oystercatchers (*Haematopus palliatus*) in the affected area of the Bouchard 120 oil spill, which occurred April 27, 2003, in Buzzards Bay, Massachusetts. This work was conducted in conjunction with general bird surveys in the affected area.

2.0 NATURAL HISTORY

American oystercatchers are migratory shorebirds that arrive on their nesting grounds in Massachusetts around the last week of March through the first week of April. This arrival schedule, in addition to their tendency to exhibit strong nest site fidelity, means that most oystercatcher pairs would have been on nesting territories before the oil spill occurred. American oystercatchers typically lay a three-egg clutch (see Photo 1). Laying begins in mid- to late-April, and clutches in Massachusetts are generally complete by the first week of May, though wet or cold weather may delay egg laying. Re-nesting is common and usually takes place within two weeks of nest loss or destruction. Nest overwash by storm or moon tides is a common occurrence and often results in re-nesting. Oystercatchers are also susceptible to human disturbance and typically select isolated areas of low human traffic. Repeated or constant human presence may cause oystercatchers to abandon their nests.

Oystercatchers forage in shallow water almost exclusively on shellfish and marine invertebrates. In Massachusetts, blue mussels, ribbed mussels, soft-shell clams, sand worms, razor clams, and hard clams are primary prey items (Nol and Humphrey, 1994). Oystercatchers winter in large flocks from New Jersey southward on the Atlantic coast in similar habitat as that used during the breeding season (Nol and Humphrey, 1994).

Photo 1. American oystercatcher nest at Ram Island with typical three-egg clutch. Photo by Woodlot Alternatives, Inc. 2003.

3.0 STUDY AREA

The study area included coastal tidal and intertidal areas of Rhode Island and Massachusetts, from Sakonnet Point in Little Compton, Rhode Island, east to Woods Hole in Falmouth, Massachusetts. The entire study area was divided into sub-areas, each of which was assigned to a separate researcher. The primary survey area for oystercatchers was from Fort Phoenix in Fairhaven, Massachusetts, east to Stony Point Dike in Wareham, Massachusetts.

4.0 METHODS

Woodlot Alternatives, Inc. (Woodlot) conducted surveys over two segments of time. The first survey was conducted May 1 – 9, 2003. During the first survey segment, field researchers recorded observations of American oystercatchers during general bird surveys in the impacted areas. The date, location, and extent of oiling were recorded for these observations.

The second survey was over a three-week period, beginning May 27, 2003, and ending June 11, 2003. During weeks 1 and 2 of the second survey period, field researchers conducted surveys of pre-determined transects located throughout the study area. Transects were determined based on known or observed feeding and nesting habitats along shoreline and marsh areas. Many of these areas were initially identified through the use of existing aerial true color photographs, maps, and shoreline reconnaissance. Researches recorded species and numbers of all birds observed, as well as numbers of birds oiled and degree of oiling, on a standardized form. When oystercatchers were observed, researchers also conducted nest searches and recorded behaviors that may have indicated nesting, brooding, or other affinity to the particular location where they were observed. During week 3, researchers surveyed areas within and outside of transect areas for the presence of oystercatchers and, when birds were observed, conducted nest searches and recorded behaviors that may have indicated nesting, brooding, or other affinity to the particular location where they were observed.

5.0 RESULTS AND DISCUSSION

5.1 Observations

Twenty-four locations were surveyed for American Oystercatchers from May 2 to June 10, 2003 (Table 1). Twenty-six of 37 birds observed were oiled.

Table 1. Sites Surveyed for Oiled American Oystercatchers (OC)

Location	Site	Date	# OC Observed	# OC Oiled*	# nests	# eggs	# chicks
Bird Island	1	9-May	1	1 (L)			
	2	9-May	1	1 (L)			
Brant Cove, Mattapoisett	1	2-May	1	1 (L)	1?		
	2	2-May	1	0			
Brant Island	1	28-May	0	0			
	2	6-June	2	2 (L)			
Fort Phoenix	1	27-May	0	0			
	2	4-Jun	0	0			
	3	4-Jun	0	0			
Great Hill	1	4-Jun	0	0			
Harbor Beach	1	3-Jun	0	0			
Hollywoods	1	3-Jun	2	2 (L)			
John Reed Road, Westport, RI	1	8-May	2	0			
Little Bay	1	3-Jun	0	0			
Mattapoissett Neck Road	1	3-Jun	0	0			

Location	Site	Date	# OC Observed	# OC Oiled*	# nests	# eggs	# chicks
Piney Point	1	4-Jun	0	0			
	2	5-Jun	0	0			
Planting Island	1	4-Jun	0	0			
Point Connett	1	3-Jun	0	0			
Pope Beach	1	27-May	0	0			
Ram Island	1	7-May	1	1 (M)	1	3	UK
	2	7-May	1	1 (M/H)			
	3	7-May	4	4 (M)			
Reservation Country Club	1	3-Jun	1	1 (L)			
	2	3-Jun	2	2 (L)			
Round Cove	1	28-May	2	0	1	1	UK
Round Island, W of West Island	1	5-Jun	2	2 (L)	1	UK	UK
Sconticut Neck, S/SW-end	1	27-May	1	1 (L)			
	2	28-May	2	2 (L)			
	3	5-Jun	1	1 (L)			
	4	5-Jun	0	0			
Silver Shell Beach, South End	1	27-May	2	2 (L)	1	1	UK

Location	Site	Date	# OC Observed	# OC Oiled*	# nests	# eggs	# chicks
South Shore WMA, Shaw's Cove	1	5-Jun	2	0			
Stony Point Dike, Wareham**	1	10-Jun	2	2 (L)	1	2	UK
	2	10-Jun	1	1 (L)			
	3	10-Jun	1	1 (L)	1	UK	1
	4	10-Jun	2	0	1	UK	UK
Swift Beach	1	4-Jun	0	0			
West Island, Rocky Point	1	28-May	2	0			
	2	5-Jun	0	0			
		Totals	**39**	**28**	**8**		**1**
				22 (L)			
				5 (M)			
				1 (M/H)			

Notes
*L = light oiling; M = moderate oiling; H = heavy oiling
** = multiple observations made at this site (1-May and 10-June)
UK = unknown

5.2 Nest Sites

American oystercatcher nesting locations that were observed or reported by others are summarized in Table 1. One nesting location was at the south end of Silver Shell Beach on Sconticut Neck in Fairhaven. Nesting habitat was an isolated sandy berm surrounding a large tidal marsh. Another nest was in the Round Cove area on the northwest tip of West Island in Fairhaven. Nesting habitat was a small, elevated sandy area surrounded by high marsh. An additional pair of oystercatchers was suspected of nesting on Round Island, just west of West Island, but the area was inaccessible to the field researchers. There is also some indication of a possible nest site at Brant Cove in Mattapoisett. An abandoned three-egg nest located on Ram Island was observed, and four abandoned oystercatcher nests were reported from the same island. Three oystercatcher pairs were found at Stony Point Dike in Wareham. One pair had a two-egg nest. Another pair was brooding at least one chick, estimated to be approximately one week old. The third pair reportedly had a nest, but it was no longer present on the date of the site visit.

5.3 Oiling

Of 39 oystercatchers observed during the early survey period, 28 were oiled (Table 1); 22 with light oiling[1], 5 with moderate oiling; and 1 with moderate to heavy oiling. The pattern of oiling was similar among most oiled birds and generally consisted of oil on the ventral feather tracts around the base of the bird's legs (see Photo 2). In some cases, legs were also oiled.

Photo 2. American oystercatcher at Ram Island, with light oiling that was typically observed throughout the study areas. Photo by Woodlot Alternatives, Inc. 2003.

Interestingly, all birds observed on Stony Point Dike during the May 7th survey period were reported as being oiled. None of the three pairs subsequently observed on June 10th were oiled.

[1] For all observations, Woodlot based the degree of oiling on oiled bird diagrams that were standardized for this spill (Appendix 2).

5.4 Oystercatcher Productivity

An accurate assessment of oystercatcher productivity requires data that were not collected as part of this study. However, many of the locations within the affected area are regularly surveyed by other researchers from the Massachusetts Department of Fisheries and Wildlife, Massachusetts Department of Environmental Management, U.S. Army Corps of Engineers, Massachusetts Audubon Society, The Nature Conservancy, and the Trustees of Reservations. These organizations may have more detailed information on numbers of nesting pairs, clutch size, and hatching success sufficient for an analysis of oystercatcher productivity.

Monomoy National Wildlife Refuge (Monomoy NWR) in Chatham, Massachusetts, may provide a control example for productivity in an undisturbed area that might be considered representative of what may have occurred in the study area in the absence of a spill and subsequent clean-up efforts.

6.0 CONCLUSION

A total of 39 American oystercatchers were observed over the course of the two survey periods, 28 of which were oiled. The pattern of oiling was similar among oiled birds, and for the majority (i.e., 22 of the 28), the degree of oiling was light. The timing, type, and extent of survey effort were insufficient to draw conclusions regarding American oystercatcher productivity in the study area.

Appendix 1

Observations of American Oystercatchers
May 1 – 9 and May 27 – June 11, 2003

Appendix 1. Observations of American Oystercatchers (AMOYs) 5/1/03 – 5/9/03 and 5/27/03 - 6/11/03

OBSERVED BY	DATE	TIME	TRANSECT	LOCATION	LAT. (N) / LONG. (W)	NOTE
SKP	5/1/03			Stony Point Dike, Wareham		Two AMOYs observed on east shoreline off Buoy 11. Both with light degree of oiling.
SKP	5/1/03			Stony Point Dike, Wareham.		One AMOY observed on west midpoint shoreline of dike with light oiling
SKP	5/1/03			Stony Point Dike, Wareham		One AMOY observed on west shoreline with light oiling, ¼ point from base of osprey nest.
SKP	5/2/03			Brant Cove, Mattapoisett		One AMOY observed on sandy shoreline, north shore of Brant Cove, with light oiling at nest site.
SKP	5/2/03			Brant Cove, Mattapoisett		One AMOY observed, no oiling observed.
KSK	5/7/03			Ram Island		One AMOY observed with moderate oiling.
KSK	5/7/03			Ram Island		One AMOY observed with moderate/heavy oil on breast, sides, and under-wing scapulars.
KSK	5/7/03			Ram Island		Four AMOYs observed with moderate oiling on under-tail coverts, belly, and base of legs.

OBSERVED BY	DATE	TIME	TRANSECT	LOCATION	LAT. (N) / LONG. (W)	NOTE
KSK	5/8/03			John Reed Rd., E Br. Westport, RI		Two AMOYs observed, no oiling observed.
KSK	5/9/03			Bird Island		One AMOY observed with light oil on lower breast, legs, and feet.
KSK	5/9/03			Bird Island		One AMOY observed with light oil on feet and one leg.
RCH	5/27/03	1600	W2A-4	South end Silver Shell Beach	Lat. 41 35.864 Long. 070 51.804	Two AMOYs observed. First observed in vicinity of tidal creek. Both with light oiling on flank feathers at base of legs. Subsequently, located nest with one egg in low, sparsely vegetated sand spit adjacent to tidal flats. Single egg at this date suggests possible re-nest.
RCH	5/27/03	1700	W2A-5	Southwest end Sconticut Neck	Lat. 41 35.329 Long. 070 51.484	One AMOY observed roosting on edge of freshwater pond with light oiling on flank feathers.
RCH	5/28/03	1000	W2A-5/6	South end Sconticut Neck	Lat. 41 35.748 Long. 070 50.711	Two AMOYs observed on small island at south end of Sconticut Neck (Wilbur Point). Both with light oiling on flank feathers at base of legs.
RCH	5/28/03	1100	W2A-7-A	Rocky Point West Island	Lat. 41 35.060 Long. 070 49.728	One AMOY observed, no oiling.
RCH	5/28/03	1200	W2A-7-A	Rocky Point West Island	Lat. 41 35.533 Long. 070 49.128	Two AMOYs subsequently observed.

OBSERVED BY	DATE	TIME	TRANSECT	LOCATION	LAT. (N) / LONG. (W)	NOTE
RCH	5/28/03	1240		Round Cove/West Island	Lat. 41 36.283 Long. 070 50.217	Two AMOYs observed along with nest with one egg. Single egg at this date suggests possible re-nest. Also heard pair of AMOYs west of this location (see 6/5/03 entry for Round Island).
RCH	6/3/03	1000	W1E-12A	Reservation CC	Lat. 41 39.426 Long. 070 48.978	One AMOY observed on beachfront with light oiling on flank feathers.
RCH	6/3/03	1030	W1E-12A	Reservation CC	Lat. 41 39.322 Long. 070 49.324	Two AMOYs observed in tidal marsh area. Both with light oiling on flank feathers.
RCH	6/3/03	1250	W1D-1	Hollywoods	Lat. 41 39.167 Long. 070 45.403	Two AMOYs observed at north end of transect. Both with light oil on flank feathers and heavier oil on legs. No evidence of nesting, lack of good nesting habitat.
RCH	6/5/03	0900		Round Island, west of West Island	Lat. 41 36.167 Long. 070 51.110	Two AMOYs observed on small island. Both with light oil on flank feathers. Unable to reach island but bird's defensive behavior suggests nest or brood nearby.
RCH	6/5/03	1400		Shaw's Cove/South Shore WMA	Lat. 41 37.663 Long. 070 50.869	Two AMOYs observed. One out on small island in cove. The other out in marsh. Returned on 6/10, observed no sign of birds.
RCH	6/5/03	09050	W2A-5	Southwest end Sconticut Neck	Lat. 41 36.551 Long. 070 51.572	One AMOY observed with light oiling on flanks.

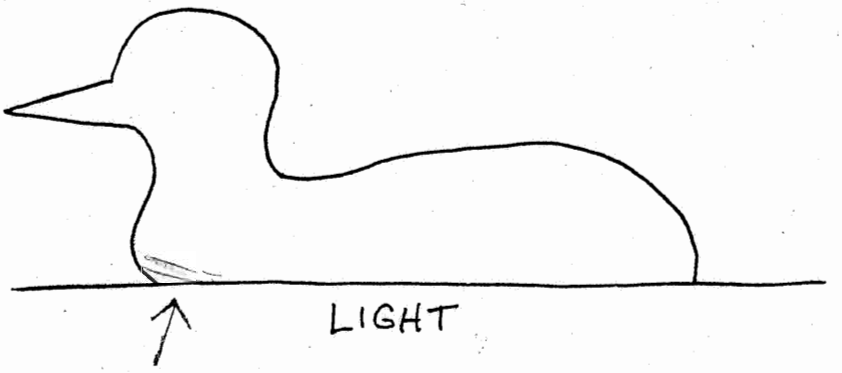
OBSERVED BY	DATE	TIME	TRANSECT	LOCATION	LAT. (N) / LONG. (W)	NOTE
RCH	6/10/03	0900	W1A-11	Stony Point Dike, Wareham	Lat. 41 42.245 Long. 070 39.716	AMOY observed foraging on rocks in intertidal zone. Silver FWS band on lower left leg.
RCH	6/10/03		W1A-11	Stony Point Dike, Wareham	Lat. 41 41.848 Long. 070 40.109	Two AMOYs observed (neither of which was banded). Nest with two eggs in narrow sandy patch between rip-rap wall and cobble beach.
RCH	6/10/03		W1A-11	Stony Point Dike, Wareham	Lat. 41 41.639 Long. 070 40.348	Two AMOYs observed (one banded and believed to be the same one observed earlier). Confirmed one chick approximately one-week old.
RCH	6/10/03		W1A-11	Stony Point Dike, Wareham	Lat. 41 42.761 Long. 070 39.287	Two AMOYs approximately 100 meters south of these coordinates did not appear to be nesting or brooding. Later met with Nat Donkin of Massachusetts Audubon Society Coastal Waterbird Program who has been monitoring this area. He reported three nesting pairs on this dike. One nest had hatched. A two-egg nest at Lat. 41 42.052/ Long. 070 39.905 was no longer present. The third nest was the two-egg nest cited above.
RCH	6/10/03	1615		Brant Island Cove	Lat. 41 37.776 Long. 070 51.140	Two AMOYs observed out in tidal marsh peninsula in middle of cove. Both with light oil on flanks and roosting on marsh edge and show no nesting or brooding behavior. Active clean-up in adjacent areas.

Note: Observations made by Woodlot Alternatives, Inc. researcher: SKP = Steven K. Pelletier; KSK = Kurt S. Karwacky; RCH = Robert C. Humphrey

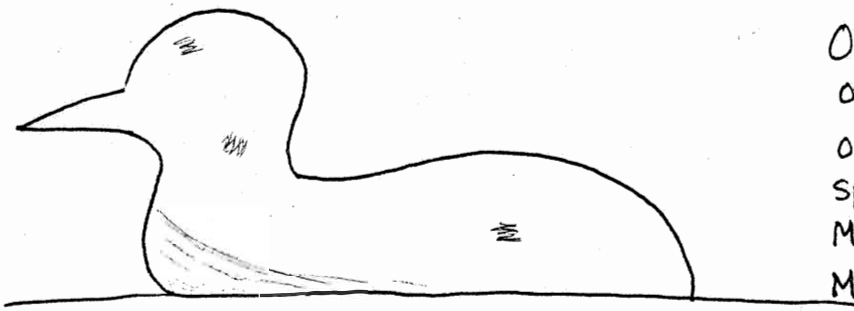
Appendix 2

Oiled Bird Diagrams

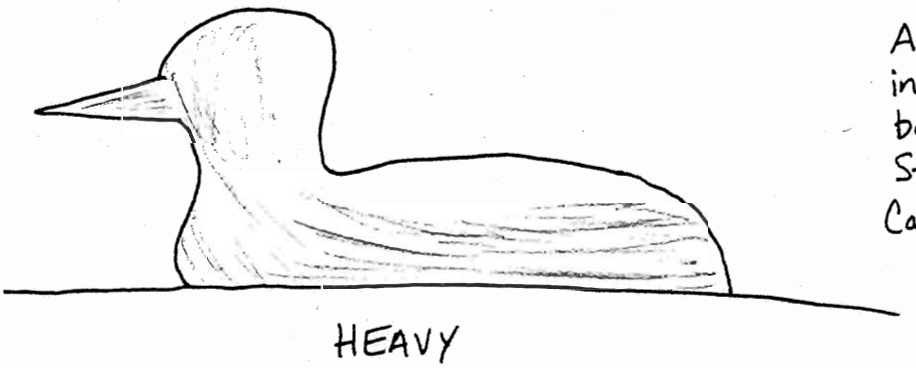
DEGREE OF OILING – WATERFOWL/MARINE BIRDS



light staining at waterline or on belly. Wings clean. Can easily fly.



Oiling at waterline and over entire belly – plus, oiled wings or several spots of oil on back/head. May preen excessively. May be able to fly – but not easily.



Almost entirely covered in oil – back of head and back may be clean. May Struggle to swim. Cannot fly.

Appendix 3
Suggested Literature

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Appendix 4

Data Sheets

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill				2. Observation Team: B. Humphrey	
3. Date: 6/4/03	4. Time Start: 16:00			5. Time End: 16:20	
6. Segment Name: Fort Phoenix				7. Segment Number: W2A-2 070	
8. Survey Length (ft):	9. Survey Width (ft): 100			10. Latitude (N): 4137450	11. Longitude (W): 54013
12. Survey Mode: (Foot) Vehicle Boat/Ship Airplane Helicopter				13. Tide Table Data at Start of Survey (ft)	
14. Weather: 58 light SE wind raining (Describe briefly)	15. Optics: (Type, magnification)			16. Visibility: (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (>1.6 km)

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Herring Gull	78					
Ring-billed Gull	2					
Ruddy Turnstone	3					
Mallard	1					
European Starling	1					
Rock Dove	2					
Great Black-backed Gull	2					
Willet	1					
House Sparrow	3					

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS
(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill		2. Observation Team B. Humphrey	
3. Date: 5/27/03	4. Time Start: 11:30	5. Time End: 12:30	
6. Segment Name: W2A-2		7. Segment Number: W2A-2	
8. Survey Length (ft):	9. Survey Width (ft): 300	10. Latitude (N): 41° 37.463	11. Longitude (W): 070° 53.9[illegible]
12. Survey Mode: (Foot) Vehicle Boat/Ship Airplane Helicopter		13. Tide Table Data at Start of Survey (ft)	
14. Weather: (Describe briefly) Overcast w/NE 10 low 50's	15. Optics: (Type, magnification) [illegible] binos [illegible] scope	16. Visibility: (circle one) <0.1 mi (<160) 0.5 mi (800m) 1.0 mi (1.6 km) (>1.0 mi (>1.6 km))	

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any. N/A

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Herring Gull	49	–	–	–	41 37.463 070 53.958 T	–
Ring-billed Gull	5	–	–	–	–	–
House Sparrow	4	–	–	–	–	–
Great black-backed Gull	1	–	–	–	T	–
Spotted Sandpiper	2	1	light	–	41.37.757 070 53.424	light oiling at base of legs
Double-crested Cormorant	1	–	–	–	T	–
Willet	1	–	–	–	T about midpoint	–
Common Tern	3	–	–	–	T	–
Ruddy Turnstone	4	–	–	–	T	–
Common Grackle	4	–	–	–	T	–
Snowy Egret	1	–	–	–	T	–
European Starling	4	–	–	–	T	–
Red-winged Blackbird	2	–	–	–	T	–
Mallard	4	–	–	–	T	–
Savannah Sparrow	2	–	–	–	T	–
					T= along Transect's entire length	

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill				2. Observation Team: B Humphrey	
3. Date: 5/27/03	4. Time Start: 12:40			5. Time End: 14:30	
6. Segment Name: Pope Beach				7. Segment Number: W2A3	
8. Survey Length (ft):	9. Survey Width (ft): 300 m			10. Latitude (N): 41 37.856	11. Longitude (W): 70 52.97
12. Survey Mode: (Foot) Vehicle Boat/Ship Airplane Helicopter				13. Tide Table Data at Start of Survey (ft)	
14. Weather: Overcast (Describe briefly) 58° Wind N 10	15. Optics: 10x42 Binocs (Type, magnification) 20x Scope			16. Visibility: (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / (>1.6 km)

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.
clean-up in progress

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Red-winged Blackbird	1	–	–	–	T	
Willet	1	–	–	–	T	N/A
Common Tern	4	–	–	–	T	
Common Grackle	4	–	–	–	T	
Herring Gull	10	–	–	–	T	
House Sparrow	3	–	–	–	T	
Double-crested	2	–	–	–	T	
						time was off by 1 hour on GPS so lat-long may need to be rechecked
					T = various locations	along Entire transect

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill			2. Observation Team: D. Humphrey		
3. Date: 5/27/03	4. Time Start: 14:40		5. Time End: 16:50		
6. Segment Name: Silver Shell Beach			7. Segment Number: W2A-4 continued		
8. Survey Length (ft):	9. Survey Width (ft): 300m		10. Latitude (N): 41 36.472	11. Longitude (W): 070 51 89	
12. Survey Mode: Foot / Vehicle / Boat/Ship / Airplane / Helicopter			13. Tide Table Data at Start of Survey (ft)		
14. Weather (Describe briefly): Overcast 60° light wind	15. Optics (Type, magnification): 10x42 binos 20x scope		16. Visibility (circle one):	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (>1.6 km)	

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Common Tern	1	–	–	–	see above T	From midpoint north to North end of Transect
Mallard	1	–	–	–	T	
Common Grackle	1	–	–	–	T	
Herring Gull	2	–	–	–	T	
Double-crested Cormorant	5	–	–	–	T	
Canada Goose	2	–	–	–	41 35 864 070 51 804	From south end of Transect to tidal creeks
Willet	3	–	–	–	"	Start @ 16:10 end @ 16:45
Ruddy Turnstone	34	–	–	–	"	now roosting on rocks and shoreline
mallard	2	–	–	–	–	
American Black Duck	2	–	–	–	–	
Least Tern	3	–	–	–	–	
Dunlin	70	–	–	–	–	
American Oystercatcher	2	2	light	no	same pair	nest with 1 egg

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill				2. Observation Team: B. Humphrey	
3. Date: 5/27/03	4. Time Start: 14:45			5. Time End: 15:15	
6. Segment Name: Silver Shell Beach				7. Segment Number: W2A4	
8. Survey Length (ft):	9. Survey Width (ft): 300m			10. Latitude (N): 41. 36. 472	11. Longitude (W): 070 51 87
12. Survey Mode: Foot Vehicle Boat/Ship Airplane Helicopter				13. Tide Table Data at Start of Survey (ft)	
14. Weather: Overcast (Describe briefly) 20° light NW wind	15. Optics: 10x40 binos (Type, magnification) 20X scope			16. Visibility: (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (>1.6 km)

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any. clean up in progress. This section from midpoint of transect south to tidal creek

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
House Sparrow	1	-	-	-	T	start point: 41 36.472 070 51 871
Willet	2	-	-	-	T	
Least Sandpiper	4	-	-	-	T	
Least Tern	1	-	-	-	T	
Ruddy Turnstone	7	4	light	no		
Semipalmated Plover	14	-	-	-	41 36 085 070 51 834	tidal creek and flats area
Black-bellied Plover	2	-	-	-	"	
Ruddy Turnstone	7	5	light	-	"	on legs
Dunlin	11	-	-	-	"	
Least Sandpiper	2	-	-	-	"	
Killdeer	1	-	-	-	"	
Mallard	2	-	-	-	"	
American Oystercatcher	2	2	light	no	"	light oil on flanks
Willet	2	-	-	-	"	

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill			2. Observation Team B. Humphrey	
3. Date: 5/27/03	4. Time Start: 16:50		5. Time End: 18:55	
6. Segment Name:			7. Segment Number: W2A5	
8. Survey Length (ft):	9. Survey Width (ft): 300 m		10. Latitude (N): 41 35 539	11. Longitude (W): 070 51.55
12. Survey Mode: (Foot) Vehicle Boat/Ship Airplane Helicopter			13. Tide Table Data at Start of Survey (ft)	
14. Weather: mid to low 60's (Describe briefly) high clouds light N wind	15. Optics: 10x40 binos (Type, magnification) 20x scope		16. Visibility: (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / (>1.0 mi (>1.6 km))

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Ruddy Turnstone	12	–	–	–		
Least Sandpiper	2	–	–	–		
Semipalmated Sandpiper	6	–	–	–		
Willet	1	–	–	–		
Common Tern	1	–	–	–		

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill				2. Observation Team: B Humphrey	
3. Date: 5/27/03	4. Time Start: 16:50			5. Time End: 18:55	
6. Segment Name:				7. Segment Number: WZA5 continued	
8. Survey Length (ft):	9. Survey Width (ft): 300m			10. Latitude (N): 41 35 329	11. Longitude (W): 070 31 48
12. Survey Mode: Foot Vehicle Boat/Ship Airplane Helicopter				13. Tide Table Data at Start of Survey (ft)	
14. Weather: (Describe briefly)	15. Optics: (Type, magnification)			16. Visibility: (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (>1.6 km)

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

residual reports oil on rocks with at the location

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Ruddy Turnstone	8	-	-	-		
Least Sandpiper	3	-	-	-		
Semipalmated Plover	3	-	-	-		
Herring Gull	4	-	-	-		On adjacent freshwater Pond
American Oystercatcher	1	1	light	no		light oiling on flanks at base of legs
Double-crested Cormorant	3	-	-	-		
Mallard	4	1	light/poss moderate	no		oiling on sides
Mallard X Black Duck	1	-	-	-		
Least Sandpiper	3	-	-	-		
American Black Duck	1	-	-	-		
Mute Swan	2	-	-	-		
						Dead Black-backed Gull & Possum found here

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study - Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill				2. Observation Team: B. Humphreys	
3. Date: 6/5/03	4. Time Start: 9:50			5. Time End: 10:40	
6. Segment Name:				7. Segment Number: WR 19 5 070	
8. Survey Length (ft):	9. Survey Width (ft): 100			10. Latitude (N): 41 35 551	11. Longitude (W): 71 572
12. Survey Mode: Foot / Vehicle / Boat/Ship / Airplane / Helicopter				13. Tide Table Data at Start of Survey (ft)	
14. Weather: mid 60's (Describe briefly) overcast light SE wind	15. Optics: 10x40 binos (Type, magnification) 20x Scope			16. Visibility: (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (>1.6 km)

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Am. Oystercatcher	1	1	light	no	41 35 551 070 5' 572	light oiling on flanks
Herring Gull	11	1	light		41 35 434 070 51 539	HFGU w/oil on eyes
Eur. Starling	1					and rump - appears lethargic
Ruddy Turnstone	5					and hesitant to fly
Rock Dove	1					Sitting on cement pad behind
Least Tern	2					house.
Common Tern	2					Later captured by
Great Black-backed Gull	2					Tri-State
Semipalmated Sandpiper	2					
Canada Goose	2	1	light			

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS
(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill			**2. Observation Team** B. Humphrey		
3. Date: 6/5/03	**4. Time Start:** 10:45		**5. Time End:** 11:00		
6. Segment Name:			**7. Segment Number:** W2A6		
8. Survey Length (ft):	**9. Survey Width (ft):** 100		**10. Latitude (N):** see previous sheet	**11. Longitude (W):**	
12. Survey Mode: ~~Foot~~ (circled) Vehicle Boat/Ship Airplane Helicopter			**13. Tide Table Data at Start of Survey (ft)**		
14. Weather: (Describe briefly) 62 wind SE 10 fog + overcast	**15. Optics: (Type, magnification)**		**16. Visibility: (circle one)**	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (>1.6 km)	L.4 (circled)

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.
Active clean up North of transect

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Rock Dove	1	/	/	/	/	/
Double-crested Cormorant	2					

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS
(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill		**2. Observation Team** B. Humphrey	
3. Date: 5/28/03	**4. Time Start:** 9:30	**5. Time End:** 10:30	
6. Segment Name: W2A-6		**7. Segment Number:** W2A-6	
8. Survey Length (ft):	**9. Survey Width (ft):** 200 m	**10. Latitude (N):** 41 39 936	**11. Longitude (W):** 070 51 263
12. Survey Mode: (Foot) Vehicle Boat/Ship Airplane Helicopter		**13. Tide Table Data at Start of Survey (ft)**	
14. Weather: (Describe briefly) high overcast 57° light SW wind	**15. Optics: (Type, magnification)** 10x40 binos 20x scope	**16. Visibility: (circle one)** <0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / (>1.0 mi (>1.6 km))	

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.
Still some remnant snare booms on rocks and still some oil on rocks

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Common Tern	8	–	–	–	–	–
Ruddy Turnstone	4	–	–	–	–	
Common Grackle	2	–	–	–	–	
House Sparrow	2	–	–	–	–	
Herring Gull	12	–	–	–	–	
European Starling	1	–	–	–	–	
Spotted Sandpiper	1	–	–	–	–	
Great black backed Gull	2	–	–	–	–	
Double Crested Cormorant	1	–	–	–	–	
Herring Gull	2	1	light		41 35 457 / 70 51 071	clean up in progress
American Oystercatcher	2				Small Isl. off point	heavier oil on rocks
Herring Gull	66					nesting
Common Eider	30					
Double-crested Cormorant	412					nesting
Great Egret	2					poss. nesting
Great black backed Gull	7					

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill		2. Observation Team B Humphrey	
3. Date: 5/28/03	4. Time Start: 10:40	5. Time End: 11:00	
6. Segment Name: W2A-7		7. Segment Number: W2A7 070	
8. Survey Length (ft):	9. Survey Width (ft): [illegible]	10. Latitude (N): 4135 745	11. Longitude (W): 70.754
12. Survey Mode: (Foot) Vehicle Boat/Ship Airplane Helicopter		13. Tide Table Data at Start of Survey (ft)	
14. Weather: (Describe briefly) high overcast 57° light SW wind	15. Optics: (Type, magnification) [illegible] binos [illegible] scope	16. Visibility: (circle one) <0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / (>1.0 mi (≥1.6 km))	

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

Clean up in progress

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Herring Gull	7	–	–	–	–	
Northern Mockingbird	1	–	–	–		
House Sparrow	3	–	–	–	–	
Common Tern	3	–	–	–	–	
				end at	4135 060 07049728	

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill		2. Observation Team: B Humphrey	
3. Date: 5/25/03	4. Time Start: 11:00	5. Time End: 12:30	
6. Segment Name: WZA-7A		7. Segment Number: WZA-7A	
8. Survey Length (ft):	9. Survey Width (ft): 200m	10. Latitude (N): 41 35 06.0	11. Longitude (W): 070 49 25
12. Survey Mode: Foot Vehicle Boat/Ship Airplane Helicopter		13. Tide Table Data at Start of Survey (ft)	
14. Weather (Describe briefly): 60 high overcast wind SW 5-10	15. Optics (Type, magnification): 10 x 21 x binocs 20 x Scope	16. Visibility (circle one): <0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (>1.6 km)	

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any. extended beginning of 7A7-A to end of 7A7

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Common Tern	4					
Ruddy Turnstone	2					
Herring Gull	4					
American Oystercatcher	1					
Double-crested Cormorant	4					
Common Tern	4				41 34 581 070 49 446	
D.C. Cormorant	2					
Herring Gull	8					
Dunlin	7					
Ruddy Turnstone	9					
Willet	1					
Black Scoter	21					
W.W. Scoter	1					
GBB Gull	1					
Ruddy Turnstone	2				41 35 365 070 49062	
DC Cormorant	2					
Common Tern	6					
Herring Gull	2					
Willet	2					

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill		2. Observation Team: R Humphrey	
3. Date: 5/25/03	4. Time Start: 11:00	5. Time End: 12:30	
6. Segment Name:		7. Segment Number: W2A-7A continued	
8. Survey Length (ft):	9. Survey Width (ft): 200m	10. Latitude (N):	11. Longitude (W):
12. Survey Mode: Foot Vehicle Boat/Ship Airplane Helicopter		13. Tide Table Data at Start of Survey (ft)	
14. Weather: (Describe briefly)	15. Optics: (Type, magnification)	16. Visibility: (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (>1.6 km)

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Herring Gull	8				41 35 533 070 49 215	
Ruddy Turnstone	8					
American Oystercatcher	2					
Snowy Egret	2				41 35 471 070 49 215	Tidal Marsh and Flats
Black-bellied Plover	1					
Ruddy Turnstone	41					
Common Tern	2					
Least Sandpiper	9					
Semipalmated Plover	1					
Willet	1					
Red-winged Blackbird	1					
Am. Black Duck	2					

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill				2. Observation Team: B. Humphrey	
3. Date: 6/5/03		4. Time Start: 12:05		5. Time End: 13:02	
6. Segment Name: West Island				7. Segment Number: W2A-7A 070	
8. Survey Length (ft):		9. Survey Width (ft): 1052		10. Latitude (N): 41 34 579	11. Longitude (W): 494 16
12. Survey Mode: (Foot) Vehicle Boat/Ship Airplane Helicopter				13. Tide Table Data at Start of Survey (ft)	
14. Weather: (Describe briefly) 65 wind SE 5 2 1/4 mile vis. fog		15. Optics: (Type, magnification)		16. Visibility: (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (>1.6 km) — 2 1/4 mi

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.
active cleanup but crew was on a break

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
No. Mockingbird	1					
Ruddy Turnstone	29					
Semi palmated Plover	1					
Common Grackle	1					
White-winged Scoter	4					
Surf Scoter	6					
Black Scoter	11					
Double-crested Cormorant	11					
Common Tern	6					
Herring Gull	2	2	light			
Great Black-backed Gull	2					
Red-breasted Merganser	3	1	light			sitting on beach preening oil spots
Willet Eggs					41 34 5 080 070 49 322	Willet egg - empty - on beach
						in wrack line - pick hole in
						shell
						Another pectoral egg was found
						near the creek mouth

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS
(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill			**2. Observation Team** E. Humphrey	
3. Date: 6/3/07	**4. Time Start:** 14:15		**5. Time End:** 15:30	
6. Segment Name: Conanicut Point			**7. Segment Number:** WI 07 070	
8. Survey Length (ft):	**9. Survey Width (ft):**		**10. Latitude (N):** 41 40 815	**11. Longitude (W):** 45 246
12. Survey Mode: Foot Vehicle Boat/Ship Airplane Helicopter			**13. Tide Table Data at Start of Survey (ft)**	
14. Weather: (Describe briefly) SW 15-20 high thin overcast	**15. Optics:** (Type, magnification) 10x 42 Zeiss		**16. Visibility:** (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (>1.6 km)

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Herring Gull	4	1	1			
Common Tern	2					
Ruddy Turnstone	2	1	light			
Common Grackle	7	1	1			
Spotted Sandpiper	5					
				end	41 41 011 070 45 132	approx

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill			2. Observation Team: B. Humphrey	
3. Date: 6/3/03	4. Time Start: 14:47		5. Time End: 15:30	
6. Segment Name:			7. Segment Number: W163 070	
8. Survey Length (ft):	9. Survey Width (ft): 100m		10. Latitude (N): 41 40 324	11. Longitude (W): 44 712
12. Survey Mode: Foot Vehicle Boat/Ship Airplane Helicopter			13. Tide Table Data at Start of Survey (ft)	
14. Weather: 03 SW 15-20 (Describe briefly) overcast	15. Optics: (Type, magnification) 10x scope		16. Visibility: (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (>1.6 km)

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Herring Gull	6					
Common Tern	6					
Double-crested Cormorant	10					
Common Grackle	5					
Great Black-backed Gull	1					
Canada Goose	4					
European Starling	3					
Common Crow	1					carrying gosling in bill
House Sparrow	3					
Mourning Dove	5					
Osprey	1					
Ring-billed Gull	1			end	41 41 011 070 45 192	approx

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS
(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill		**2. Observation Team** [illegible]	
3. Date: 6/3/03	**4. Time Start:** 12:50	**5. Time End:** 13:30	
6. Segment Name: [illegible]		**7. Segment Number:** [illegible]	
8. Survey Length (ft):	**9. Survey Width (ft):** [illegible]	**10. Latitude (N):** 41 39 167	**11. Longitude (W):** 070 45 403
12. Survey Mode: Foot (circled) Vehicle Boat/Ship Airplane Helicopter		**13. Tide Table Data at Start of Survey (ft)**	
14. Weather: (Describe briefly) 71 [illegible] hazy thin overcast	**15. Optics: (Type, magnification)** [illegible]	**16. Visibility: (circle one)** <0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (>1.6 km) (circled)	
17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.			

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Willet	2				?	
Common Eider	1					
House Sparrow	3					
Spotted Sandpiper	2					
Am. Oystercatcher	2	2	light		North end of transect	heavy on legs of one
Common Tern	1	1	1			
					41 39 795 070 45 636	end

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS
(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill			**2. Observation Team** B. Humphrey	
3. Date: 6/3/03	**4. Time Start:** 13:40		**5. Time End:** 13:55	
6. Segment Name: Harbor Beach			**7. Segment Number:** NWD-2 070	
8. Survey Length (ft):	**9. Survey Width (ft):**		**10. Latitude (N):** 41 40 102	**11. Longitude (W):** 45 483
12. Survey Mode: Foot Vehicle Boat/Ship Airplane Helicopter			**13. Tide Table Data at Start of Survey (ft)**	
14. Weather: (Describe briefly) 72° high thin overcast wind S/SW 10	**15. Optics:** (Type, magnification)		**16. Visibility:** (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (>1.6 km)

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Common Tern	4					
Osprey	2					
G. Black backed Gull	1				41 40 251 070 45 658	end

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill				2. Observation Team: B. Humphrey	
3. Date: 6/4/03	4. Time Start: 10:10			5. Time End: 10:30	
6. Segment Name: Pinery Point				7. Segment Number: WLB-7 070	
8. Survey Length (ft):	9. Survey Width (ft): 100			10. Latitude (N): 41 11 682	11. Longitude (W): 43 158
12. Survey Mode: Foot Vehicle Boat/Ship Airplane Helicopter				13. Tide Table Data at Start of Survey (ft)	
14. Weather: (Describe briefly) 59 overcast light S wind	15. Optics: (Type, magnification) 10x40 binos 20x scope			16. Visibility: (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (>1.6 km)

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Common Tern	2				T	
Common Loon	3					
Great black backed Gull	1					
Willet	1					
				End	41 41 33 Z 070 43 129	

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill				**2. Observation Team** B Humphrey	
3. Date: 5/28/10	**4. Time Start:** 12:40			**5. Time End:** 13:00	
6. Segment Name: Area of Opportunity 15 Northeast Pond Cove				**7. Segment Number:** A00 15 070	
8. Survey Length (ft):	**9. Survey Width (ft):** 100m			**10. Latitude (N):** 41 36 156	**11. Longitude (W):** 50 101
12. Survey Mode: (Foot) Vehicle Boat/Ship Airplane Helicopter				**13. Tide Table Data at Start of Survey (ft)**	
14. Weather: 64 high thin overcast **(Describe briefly)** wind SW 10	**15. Optics:** 10x binoculars **(Type, magnification)** 30x scope			**16. Visibility:** (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / (>1.0 mi (>1.6 km))

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Red-winged Blackbird	6					
Herring Gull	9					
SEmipalmated Plover	2					
Common Grackle	2					
Least Sandpiper	7					
Red-breasted Merganser	1					
Spotted Sandpiper	3					
American Oystercatcher	1				4136 283 070 50 217	nest w/ one egg
Ruddy Turnstone	2					
Mallard	1					

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill				2. Observation Team: B. Humphreys	
3. Date: 6/4/03	4. Time Start: 11:00			5. Time End: 11:45	
6. Segment Name: Great Island				7. Segment Number: WIB 9	
8. Survey Length (ft):	9. Survey Width (ft):			10. Latitude (N): 41 12 96	11. Longitude (W): 43 392
12. Survey Mode: (Foot) Vehicle Boat/Ship Airplane Helicopter				13. Tide Table Data at Start of Survey (ft)	
14. Weather: (Describe briefly) 60 11 SE wind light rain	15. Optics: (Type, magnification)			16. Visibility: (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / (>1.6 km)

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Mourning Dove	3				T	
Killdeer	1					
Am. Black Duck	2					
Double-crested Cormorant	6					
Spotted Sandpiper	1					
Common Tern	7					
Osprey	1					
Herring Gull	1					
Common Eider	3					
				end	41 42 150 070 43 116	

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill			2. Observation Team: B. Humphrey	
3. Date: 6/4/03	4. Time Start: 13:15		5. Time End: 13:45	
6. Segment Name: Smiths Beach			7. Segment Number: WI B-12 070	
8. Survey Length (ft):	9. Survey Width (ft): 100		10. Latitude (N): 41 44 22.4	11. Longitude (W): 43 160
12. Survey Mode: (Foot) Vehicle Boat/Ship Airplane Helicopter			13. Tide Table Data at Start of Survey (ft)	
14. Weather: 58° wind E/SE 10 (Describe briefly) rain	15. Optics: 10x40 binos (Type, magnification)		16. Visibility: (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / (>1.0 mi (>1.6 km))

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Common Grackle	4				T	
No. Mocking bird	2					
Mourning Dove	1					
Herring Gull	9					
Great Black-backed Gull	3					
Rock Dove	3					
Ruddy Turnstone	6					
Common Tern	2					
				End	41 41 11.83 070 42 56.0	

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill			2. Observation Team: D Humphrey
3. Date: 6/3/03	4. Time Start: 16:00		5. Time End: 16:30
6. Segment Name: little Island			7. Segment Number: W1C-4 070
8. Survey Length (ft):	9. Survey Width (ft): 100m		10. Latitude (N): 41 41 788 / 11. Longitude (W): 45266
12. Survey Mode: Foot Vehicle Boat/Ship Airplane Helicopter			13. Tide Table Data at Start of Survey (ft)
14. Weather: (Describe briefly) 63 wind 10-15 SW overcast	15. Optics: (Type, magnification) 10x40 binos 20x scope		16. Visibility: (circle one) <0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (>~~1.6 km~~)

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Common Grackle	9					
Mourning Dove	1					
Herring Gull	4					
Canada Goose	6					
Ring-billed Gull	1					
Osprey	1					
Spotted Sandpiper	1					
Mallard	1					
Great Black-backed Gull	1					
				end	41 42 174 070 45 538	

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill				2. Observation Team: B. Humphrey	
3. Date: 6/4/03	4. Time Start: 9:10			5. Time End: 9:45	
6. Segment Name: Planting Island				7. Segment Number: WIC-5 070	
8. Survey Length (ft):	9. Survey Width (ft): 100			10. Latitude (N): 41 41 312	11. Longitude (W): 43 211
12. Survey Mode: Foot / Vehicle / Boat/Ship / Airplane / Helicopter				13. Tide Table Data at Start of Survey (ft)	
14. Weather: (Describe briefly) 55° overcast 11 SE wind rain	15. Optics: (Type, magnification) 10x50 binos			16. Visibility: (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (>1.6 km)

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

Active cleanup just ending

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Great Black-backed Gull	9				T	Beach was littered
Common Tern	2					with dead skates
Killdeer	1					14-18" long
Common Grackle	3					
Herring Gull	3					
Mourning Dove	5					
European Starling	2					
No. Mocking bird	1					
Willet	2					
				End	41 41 690 070 44 482	

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill				2. Observation Team: B Humphrey	
3. Date: 6/5/03	4. Time Start: 13:50			5. Time End: 14:20	
6. Segment Name: Shaws Cove Area				7. Segment Number: N/A	
8. Survey Length (ft):	9. Survey Width (ft):			10. Latitude (N): 41 37 16	11. Longitude (W): 70 869
12. Survey Mode: (Foot) Vehicle Boat/Ship Airplane Helicopter				13. Tide Table Data at Start of Survey (ft)	
14. Weather: 63 drizzle (Describe briefly) 11 SSE wind	15. Optics: (Type, magnification)			16. Visibility: (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (>1.6 km)

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.
small spots of oil on rocks

2 1/4 mile

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Herring Gull	1					
Mallard	1					
Common Tern	2					
Spotted Sandpiper	2					
Am. Oystercatcher	2					one AMOY on small island out in the Bay
				end	41 37 663	the other was calling
					070 58 506	from marsh to the west.
						unable to get to due
						to tidal creek

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill		2. Observation Team: B. Humphrey	
3. Date:	4. Time Start: 9:00	5. Time End: 9:30	
6. Segment Name: Small Island North of West Island Causeway		7. Segment Number: 0/17	070
8. Survey Length (ft):	9. Survey Width (ft): 100	10. Latitude (N): 41 35 952	11. Longitude (W): 51724
12. Survey Mode: Foot Vehicle Boat/Ship Airplane Helicopter		13. Tide Table Data at Start of Survey (ft)	
14. Weather: 63 light NE wind overcast (Describe briefly)	15. Optics: 10x [illegible] binoculars 20x scope (Type, magnification)	16. Visibility: (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (>1.6 km)

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Am. Black Duck	4					
Least Tern	2					
Herring Gull	1					
Little Blue Heron	1					
Snowy Egret	5					
Willet	2					
Red-winged Blackbird	1					
Ruddy Turnstone	29					
Great Black-backed Gull	2					
Double-crested Cormorant	1					
Great Egret	1					
Am. Oystercatcher	2	2	light		41 36 167 070 51 110	Both lightly oiled on flank feathers
						Behavior suggests nesting
						but unable to reach
						Island

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill				2. Observation Team: B. Humphrey	
3. Date: 6/5/03	4. Time Start: 7:50			5. Time End:	
6. Segment Name: Pine Island Point Spit				7. Segment Number: N/A 070	
8. Survey Length (ft):	9. Survey Width (ft): 100			10. Latitude (N):	11. Longitude (W): 46170
12. Survey Mode: (Foot) Vehicle Boat/Ship Airplane Helicopter				13. Tide Table Data at Start of Survey (ft)	
14. Weather: (Describe briefly) Overcast	15. Optics: (Type, magnification)			16. Visibility: (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / (1.0 mi (1.6 km)) / >1.0 mi (>1.6 km)
17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.					

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Willet	14				T	
Ruddy Turnstone	15					
Least Tern	2					
Least Sandpiper	2					
Mourning Dove	7					
Spotted Sandpiper	3					
Double-crested Cormorant	1					
Herring Gull	5					
Mallard	2					
Osprey	1					
Great Black backed Gull	2					
Common Grackle	4					
European Starling	1					
				Cnd	41 38 958 070 46 4169	

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill				2. Observation Team R. Humphrey	
3. Date: 5/28/03	4. Time Start: 16:10			5. Time End: 16:30	
6. Segment Name: Brant Island				7. Segment Number: WLF-10 (S) 070	
8. Survey Length (ft):	9. Survey Width (ft): 100m			10. Latitude (N): 41 37 770	11. Longitude (W): 49 310
12. Survey Mode: Foot Vehicle Boat/Ship Airplane Helicopter				13. Tide Table Data at Start of Survey (ft)	
14. Weather: Ptly Cloudy 57° (Describe briefly) wind SW 25+	15. Optics: 10x40 binos (Type, magnification) 20x Scope			16. Visibility: (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (>1.6 km)

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.
some bad oil spots on rocks; clean up in progress

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Common Tern	4	—	—	—	—	
Non Marking bird	1	—	—	—	—	
Great Black-backed Gull	2	—	—	—	—	* Clean up Crew Reports nest w/3 eggs

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS
(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill		2. Observation Team B. Humphrey	
3. Date: 6/3/03	4. Time Start: 8:30	5. Time End: 8:50	
6. Segment Name: Matt. Neck		7. Segment Number: W1F-11	
8. Survey Length (ft):	9. Survey Width (ft): 100 m	10. Latitude (N): 41 37.457	11. Longitude (W): 070 48.595
12. Survey Mode: **Foot** (circled) Vehicle Boat/Ship Airplane Helicopter		13. Tide Table Data at Start of Survey (ft)	
14. Weather: (Describe briefly) 630 clear lt N wind	15. Optics: (Type, magnification) 10x40 binos 20x scope	16. Visibility: (circle one) <0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / **>1.0 mi (>1.6 km)** (circled)	
17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any. Clean up in progress some fairly heavy oil on rocks			

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Willet	3	–	–	–	T	
Great black-backed Gull	3	–	–	–	T	
Herring Gull	1	–	–	–	T	
Common Tern	3	–	–	–	T	
						end @ 41 37 658 070 48 232

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill				2. Observation Team: B Humphrey	
3. Date: 6/3/03	4. Time Start: 9:05			5. Time End: 9:30	
6. Segment Name: Mott Hill Rd				7. Segment Number: WIF-12	
8. Survey Length (ft):	9. Survey Width (ft): 100m			10. Latitude (N): 41 38 032	11. Longitude (W): 48 177
12. Survey Mode: (Foot) Vehicle Boat/Ship Airplane Helicopter				13. Tide Table Data at Start of Survey (ft)	
14. Weather: (Describe briefly) 64 clear lt. NNW breeze	15. Optics: (Type, magnification) 10x40 binos 20x scope			16. Visibility: (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / (>1.0 mi) (>1.6 km)

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

clean up in progress

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Double-crested Cormorant	14	–	–	–	T	
Herring Gull	2	–	–	–	T	
Common Grackle	2	–	–	–	T	
Common Tern	5	–	–	–	T	
Mourning Dove	2	–	–	–	T	
						end at 41 37 917 070 48 022

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill				2. Observation Team: E Humphrey	
3. Date: 6/3/03		4. Time Start: 10:00		5. Time End: 10:55	
6. Segment Name: Reservation CC				7. Segment Number: WIF-12A 070	
8. Survey Length (ft):		9. Survey Width (ft): 100m		10. Latitude (N): 41 39 111	11. Longitude (W): 49 402
12. Survey Mode: Foot Vehicle Boat/Ship Airplane Helicopter				13. Tide Table Data at Start of Survey (ft)	
14. Weather: (Describe briefly) 65 clear light N wind		15. Optics: (Type, magnification) 10x binoculars 20x Scope		16. Visibility: (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / ~~>1.0 mi (>1.6 km)~~

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
No. Mocking bird	1	–	–	–	T	
Mourning Dove	1	–	–	–	T	
Am. Oystercatcher	1	1	light	–	T	
Common Tern	2	1	light	–	T	
Herring Gull	9	–	–	–	T	
G. Black-backed Gull	2	–	–	–	T	
Osprey	1	–	–	–	T	In Marsh ↓
Great Egret	2	–	–		MARSH	41 39.322
Herring Gull	4	–	–			070 49.324
Ring-billed Gull	24	–	–			
G. Black-backed Gull	1	–	–			
Am. Oystercatcher	2	2	light			end @ 41 39 426 070 48 978
Mallard	6	–	–			

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS
(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill			**2. Observation Team** B. Humphreys	
3. Date: 6/3/03	**4. Time Start:** 11:05		**5. Time End:** 11:30	
6. Segment Name: Dot Point			**7. Segment Number:** WIE-13 070	
8. Survey Length (ft):	**9. Survey Width (ft):** 200		**10. Latitude (N):** 41 30 39	**11. Longitude (W):** 47 725
12. Survey Mode: ~~Foot~~ Vehicle Boat/Ship Airplane Helicopter			**13. Tide Table Data at Start of Survey (ft)**	
14. Weather: (Describe briefly) clear 65 w SW 10-15	**15. Optics:** (Type, magnification) 10 x 42 binocs 20 x scope		**16. Visibility:** (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (>1.6 km)

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.
active clean up on East end Snare boom on beach front

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Common Tern	1	–	–	–	T	–
Great Black-backed Gull	2	–	–		T	–
					41 39 107 070 47 718	encl

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill		**2. Observation Team** B. Humphreys	
3. Date: 6/3/03	**4. Time Start:** 11:55	**5. Time End:** 12:10	
6. Segment Name: Point Connett		**7. Segment Number:** WI E-14 070	
8. Survey Length (ft):	**9. Survey Width (ft):**	**10. Latitude (N):** 41 38 942	**11. Longitude (W):** 45 859
12. Survey Mode: Foot Vehicle Boat/Ship Airplane Helicopter		**13. Tide Table Data at Start of Survey (ft)**	
14. Weather: (Describe briefly) clear/ptly cloudy	**15. Optics:** (Type, magnification) 10x40 binoc 20x Scope	**16. Visibility:** (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (>1.6 km)

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
European Starling	1	–	–	–	T	/
House Sparrow	2	–	–	–	T	
					41 38 673 070 46 096	end
Willet	6	–			Angelica Point	Incidental observations from
Ruddy Turnstone	2	–				Angelica Point - not in transect
Common Tern	1	–				
Killdeer	2	–				
Gadwall	2	–				
Common Eider	1	–				
Double-crested Cormorant	33	–				
Spotted Sandpiper	1	–				
					41 38 673 070 46 096	end

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill				2. Observation Team: R. Humphrey	
3. Date: 5/28/03	4. Time Start: 16:10			5. Time End: 16:30	
6. Segment Name: Brant Island				7. Segment Number: W.I. F-10 (S) 070	
8. Survey Length (ft):	9. Survey Width (ft): 100 m			10. Latitude (N): 41 37 770	11. Longitude (W): 49 310
12. Survey Mode: Foot Vehicle Boat/Ship Airplane Helicopter				13. Tide Table Data at Start of Survey (ft)	
14. Weather: Pt ly Cloudy 57° (Describe briefly) wind SW 25+	15. Optics: 10x110 binos (Type, magnification) 20x Scope			16. Visibility: (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (>1.6 km)

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

some bad oil spots on rocks; cleanup in progress

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Common Tern	4	—	—	—	—	
Nor. Mocking bird	1	—	-	—	—	
Great Black-backed Gull	2	—	-	—	—	* Clean up Crew Reports nest w/ 3 eggs

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill			2. Observation Team: T. Humphreys	
3. Date: 5/28/03	4. Time Start: 13:50		5. Time End: 14:30	
6. Segment Name: W2A8			7. Segment Number: W2A8 010	
8. Survey Length (ft):	9. Survey Width (ft): 100 m		10. Latitude (N): 41 36.749	11. Longitude (W): 57 176
12. Survey Mode: Foot Vehicle Boat/Ship Airplane Helicopter			13. Tide Table Data at Start of Survey (ft)	
14. Weather: (Describe briefly) Partly cloudy 65° wind SW 10-15	15. Optics: (Type, magnification) 10x40 binos 20x scope		16. Visibility: (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / >1.0 mi (≥1.6 km)

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Herring Gull	5					
Willet	2					
Great Black-backed Gull	1					
Common Grackle	3					
Northern Mockingbird	1					
Least Tern	1					

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill			2. Observation Team B. Humphrey
3. Date: 5/28/03	4. Time Start: 15:30		5. Time End: 16:00
6. Segment Name: W2A9			7. Segment Number: W2A9 070
8. Survey Length (ft):	9. Survey Width (ft): 100m		10. Latitude (N): 41 37 493 / 11. Longitude (W): 49970
12. Survey Mode: (Foot) Vehicle Boat/Ship Airplane Helicopter			13. Tide Table Data at Start of Survey (ft)
14. Weather: (Describe briefly) 63 hazy wind SW 15-20	15. Optics: (Type, magnification) 10x70 binos 20x scope		16. Visibility: (circle one) <0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / ~~>1.0 mi (>1.6 km)~~

17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.

Oil on rocks

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Common Tern	5					
Herring Gull	2					
Canada Goose	36					
Willet	2					
						end @ 41 37 635 070 49 566

WILDLIFE FIELD RECONNAISSANCE FORM – SHORELINE OR ON-WATER OBSERVATIONS

(Bird Transect Study – Live Bird Form)

1. Incident Name: Bouchard Barge No. 120 oil spill				2. Observation Team: B. Humphrey	
3. Date: 5/28/03	4. Time Start: 13:50			5. Time End: 14:00	
6. Segment Name: W2A8				7. Segment Number: W2A8 070	
8. Survey Length (ft):	9. Survey Width (ft): 100 m			10. Latitude (N): 41 36749	11. Longitude (W): 51 156
12. Survey Mode: (Foot) Vehicle Boat/Ship Airplane Helicopter				13. Tide Table Data at Start of Survey (ft)	
14. Weather: (Describe briefly) cleaning ptly cloudy wind SW 10-15	15. Optics: (Type, magnification) 10 x 50 bino 20 x scope			16. Visibility: (circle one)	<0.1 mi (<160) / 0.5 mi (800m) / 1.0 mi (1.6 km) / (>1.6 km)
17. Briefly describe beach oiling in transect and cleanup efforts ongoing during survey, if any.					

Species Name	# Birds in group	# birds oiled	Average degree of oiling of group (None/Light/ Moderate/Heavy)	Photo Yes/No	Location (Lat/Long)	Comments on Wildlife (Recoverable? Abnormal behavior? Etc.)
Herring Gull	5					
Willet	2					
Great black-backed Gull	1					
Common Goldeneye	3					
No. Mockingbird	1					
Local Town	1					

DRAFT – WORK IN PROGRESS

REPORT FOR THE JOINT ASSESSMENT TEAM, BOUCHARD 120 OIL SPILL

BIRDS OBSERVED DURING AN AERIAL SURVEY OF BUZZARDS BAY, MASSACHUSETTS ON 2 MAY 2003

Submitted by:

Jeremy J. Hatch, Kurt Karwacky and Juli Anna McNutt

Revised by members of the Joint Assessment Team

This report summarizes observations of birds made during an aerial survey of Buzzards Bay, MA on 2 May 2003, five days after a spill of No. 6 fuel oil in the Bay (the Bouchard Tank-Barge 120 spill). At the time of the survey, oil was distributed on the water surface and had oiled some shoreline. The aerial survey route extended along the shores of Buzzards Bay with nine North-South transects in the center of the bay, and with extensions to adjacent areas where seaducks were known to be abundant (Vineyard Sound and Gay Head, Martha's Vineyard).

Aircraft and Observers

The survey plane was a Twin Otter from NOAA.

The survey crew comprised the following:

- Dr. Jeremy Hatch, University of Massachusetts, Boston
- Scott Hecker, National Audubon Society
- Kurt Karwacky, Woodlot Alternatives
- Juli Anna McNutt, ENTRIX.

The two observers sat in the forward seats, with recorders behind. Observations were located by use of landmarks (and time), and marked on maps. (No functioning GPS system was available). Hatch (left observer) and Hecker (right observer) observed for the first leg of the survey (along the shorelines of Buzzards Bay); for the second leg (after Hecker departed) observers were Hatch (left observer) and Karwacky (right observer). Observers reported over the intercom the birds and seals seen through the bubble-window on their side of the plane: an unknown area directly below the plane was not visible. After the flight, the data were transferred to Microsoft Excel and then Microsoft Access. The data were summarized spatially in ArcMap (version 8.3) as shown in Figures 1, 2, and 3 and numerically in Tables 1, 2, and 3.

Survey Route and Coverage

The plane traveled at an altitude of 150 m (500 ft), and airspeed of 166 km/h (90 knots), over the route shown in Fig 1. The first leg was from Otis AFB (take-off 1504 h [hours] on 2 May) south along the eastern side of Buzzards Bay, west along the northern shores of the Elizabeth Islands, north along the western side of the Bay and then returned to Otis to drop off Scott Hecker (return at 1704 h). In the second leg, (take-off 1726 h) the route ran from Otis to Woods Hole, then along the southern shores of the Elizabeth Islands, then to Gay Head and Squibnocket on Martha's Vineyard, and then flew 9 north-south transects in Buzzards Bay, returning to Otis at 1925 h. The transects were on average approximately 3,390 meters (m) apart (range 2,360 to 4,230 m apart).

Wind throughout the survey was 210°, 19 – 30 km/hr (10-14 knots); sky was generally cloudy; visibility was good except for thick low-level fog at the entrance to the Bay (locations indicated on Figure 1).
Observers reported all birds and seals encountered without distance information, because the limited lead-time available provided no opportunity to set up sighting-markers for ranges. The numbers of cormorants, gulls, and terns at colony-sites on islands were not precisely established. In practice, most reports of single birds were probably within 300 m of the track, while some large flocks were more distant; however, this does not mean that all birds within a transect 600 m wide were counted (Figure 3 exhibits 300 m scale). These numbers are minima observed, and not densities.

For comparative purposes, a list of the species brought to the Treatment Center was obtained from USFWS, and the numbers of pairs nesting at the principal colonies were obtained from Mass Wildlife.

Any extrapolation of the survey data to obtain an estimate of birds for the entire bay is complicated by three facts. First, the plane flew higher than the elevation typically used in seabird surveys. Second, sighting markers were not set up for estimating distances. Finally, a working GPS was not present. See the Discussion for additional information.

Results

Nineteen different taxa (species or genera) of water birds were recorded. For several of these, the component species were not enumerated separately. A numerical summary of dispersed birds (at sea or on shore) is presented in Table 1, those at nesting colonies in Table 2, and birds counted per transect in Table 3. The spatial distributions of all sightings are shown in Figure 1. Spatial distributions organized by species, including only loons, scoters, bufflehead, merganser, eiders, and cormorants (not including numbers of individuals) are shown in Figure 2. Tern spatial distributions in Buzzards Bay are exhibited in Figure 3. The sightings of grebes, egrets, gannets, geese, gulls, razorbills, willets, and oystercatchers are not exhibited visually on a map.

- **Loons.** Twenty-one individuals recorded, throughout the survey, singly or in small groups (up to 5 individuals). Common Loon was the only species identified; however, both Common Loon and Red-throated Loon were received by the Treatment Center.

- **Grebes.** None recorded on the survey but two species known to be present amongst birds collected on shore and taken to the Treatment Center.

- **Northern Gannet.** Three individuals observed: one in Buzzards Bay, two near Gay Head.

- **Double-crested Cormorant.** Abundant at the nesting colony on the Weepecket Islands in the southeastern corner of the Bay, where there were about 400 occupied nests, in 4 subcolonies. On the western side of the Bay about 80 nests were seen on Angelica Rock. Elsewhere, small numbers were recorded on rocks and very small numbers were seen flying or swimming.

- **Egrets.** Five individuals, probably all Great Egrets, noted in coastal ponds and estuaries.

- **Mute Swan.** Thirteen pairs noted in coastal ponds, none of these were on saltwater although this species does occur in estuaries and occasionally in the open sea.

- **Canada Goose.** None reported during the survey although small numbers were known to be present in the area (e.g., on Bird and Ram Islands) and the species is known to occur on saltwater.

- **Common Eider.** In Buzzards Bay, 38 were observed, but none near Bird Island where three pairs were known to be nesting (obs. JJH). No large rafts of wintering Eiders were encountered near Cuttyhunk where thousands had been present during the winter (JJH).

- **Scoters.** Each of the three species of scoter (Surf, Black, White-winged) was observed but they were not separately enumerated because too similar in appearance. 2440 individuals were noted in Buzzards Bay, most in flocks near the eastern shore. Very large flocks (about 10,000 birds) were recorded in Vineyard Sound, and also near Gay Head, where they were widely distributed in the area between the two points identified on Figures 1, 2, and 3.

- **Red-breasted Merganser and Bufflehead.** Seen in small numbers (38 and 23, respectively) along the shores.

- **Gulls.** Both Great Black-backed and Herring Gulls were identified but were not enumerated separately and the numbers may have included the smaller Ring-billed Gull. All three species were brought to the Treatment Center. Gulls were recorded at sea, along the shore and also at the principal colony-sites, on Weepecket and Penikese Is. and Angelica Rock (see Table 2).

- **Terns.** Two species were observed: Common and Roseate, but their relative numbers could not be established because distinguishing the species from the air is difficult. Figure 3 exhibits approximate number of individuals and locations of terns observed during the survey. The timing of the survey covered both the afternoon period of feeding when terns are typically distributed widely, and the evening when terns typically assemble at overnight roosts (commonly where they later nest). Most records of terns foraging were in the eastern and northern parts of the Bay and near Woods Hole (Figure 3). The numbers observed at colony-sites (Table 2) may have been influenced by the timing of the flight in relation to birds' return to roost at the end of the day: largest numbers were seen on Bird Island, visited last, and there were none at Penikese, the first site visited. Another important factor affecting the numbers at the roost is the return of the birds from the winter grounds, which is indexed by the date of the first egg; earliest on Bird Island and latest on Penikese Island.

- **Razorbill.** Six Razorbills noted: one in the Bay, five near Gay Head. (This species is the most likely alcid to be present, although specific identification was not confirmed).

- **Other species.** Twelve Willets and one Oystercatcher were seen along the west shore: these species are unlikely to be detected (except when they are flying).

- **Seals.** Fifty-five individuals were noted at three sites along the Elizabeth Islands. The majority were probably Harbor seals and none appeared to be oiled. No seals were present on Seal Island in Nasketucket Bay, Mattapoiset (near Ram I).

Discussion

The numbers reported here represent a snapshot of the waterbirds present and interpretation can be clouded by several factors:

1) The altitude of the plane (500ft), prescribed by the pilots, was higher than is usual for seabird surveys and would influence detectability, so that the less conspicuous species could have been underrepresented. Such species include grebes and small ducks at sea and numerous species on the shoreline.

2) The spill occurred during the migration period when rapid turnover is likely. Loons and seaducks occur in Buzzards Bay both as winter residents and spring transients.

3) Double-crested Cormorants lay eggs from early April to mid May: the numbers of nests observed in early May may not be representative.

4) Gulls: at the date of the survey, many gulls would be expected at the colony sites and some would have laid eggs. Some of the potential breeders would be away, foraging. Many of the gulls on the distant shorelines are likely to be immatures.

5) Terns are summer residents, arriving from mid April to mid May and laying eggs from about 10 May. In early May, the numbers visible at colony-sites vary greatly over the diurnal cycle because most are absent foraging by day and gather in the evening to roost.

TABLES

Table 1. Estimated Birds observed during aerial survey of Buzzards Bay, 2 May 2003 (not including colony-sites).*

Species	Buzzards Bay shorelines			Transects	Vineyard Sound	Gay Head	Total
	East	South	West				
American Oystercatcher			1				**1**
Osprey		1					**1**
Willet			12				**12**
Loons	5	1	1	7		7	**21**
Gannet				1		2	**3**
Cormorant	11	31	109	3	13		**167**
Egrets		1	4				**5**
Mute Swan	2		9		2		**13**
Eider	4	18	16	1	110	100	**249**
Scoters (Black, White-winged and Surf)	270	30		2139**	5050	5156	**12645**
R-b Merganser	10	16	5		7		**38**
Bufflehead			8		15		**23**
Gulls (Great Black- back and Herring)	40	67	160	52	36	17	**372**
Terns (Common and Roseate)	224	63	46	147	20		**500**
Razorbill				1		5	**6**

* Note: Both numbers and locations of shorelines are estimated; due to time constraints, there is a potential for slight change in numbers and should only be interpreted as general area and numbers.
** Note: May include some birds counted on the first leg of the survey.

Table 2. Estimated Numbers at colony-sites in Buzzards Bay during survey and numbers in recent censuses.

Site	Individuals - 02 May 2003			Recent census - Individuals		
	Cormorants	Gulls	Terns	Cormorants	Gulls	Terns
				in 1994	in 1994	in 2002
Weepeckets	400	1000	0	3756	1036	0
Penikese	0	2000	0	0	1602	558
Angelica Rock	80	160	0	260	544	0
Ram Island	0		600	0	0	6518
Bird Island	0		2000	0	0	4414

Note:
Cormorants = apparently occupied nests
Gulls = birds in nesting area
Terns = birds flushed by plane

Note:
Cormorants = apparently occupied nests
Gulls = nest count
Terns = nest count

Table 3. Estimated Numbers observed on transects in Buzzards Bay during survey (not including colony-sites).

Transect Number	Direction	Species	Number of Individuals
1	N	SSC	1
1	N	COLO	1
1	N	HEGU	1
2	S	COLO	1
2	S	HEGU	2
2	S	HEGU	1
2	S	HEGU	2
2	S	HEGU	1
3	N	HEGU	2
3	N	HEGU	1
3	N	TERN	20
3	N	HEGU	2
3	N	HEGU	1
3	N	HEGU	3
4	S	EIDR	1
4	S	TERN	6
4	S	HEGU	2
4	S	CORM	1
5	N	HEGU	1
5	N	SCOT	4
5	N	HEGU	1
5	N	RZB	1
5	N	TERN	2
5	N	GULL	4
5	N	TERN	8
6	S	TERN	14
6	S	TERN	4
6	S	TERN	5
6	S	HEGU	2
6	S	LOON	1
6	S	TERN	2
6	S	TERN	1
6	S	HEGU	1
7	N	LOON	1
7	N	HEGU	2
7	N	HEGU	2
7	N	GULL	2
7	N	CORM	1

Table 3. Estimated Numbers observed on transects in Buzzards Bay during survey (not including colony-sites) (continued.)

Transect Number	Direction	Species	Number of Individuals
7	N	CORM	1
7	N	GULL	1
7	N	GBBG	1
7	N	GAN	1
7	N	GBBG	1
7	N	TERN	8
8	N	GBBG	3
8	S	TERN	6
8	S	HEGU	1
8	S	TERN	3
8	S	TERN	2
8	S	TERN	7
8	S	LOON	1
8	S	TERN	4
8	S	TERN	2
8	S	TERN	9
8	S	LOON	1
8	S	HEGU	1
8	S	LOON	1
8	S	TERN	16
8	S	TERN	8
8	S	HEGU	1
8	S	TERN	20
9	N	HEGU	1
9	N	SCOT	50
9	N	HEGU	1
9	N	SCOT	4
9	N	HEGU	1
9	N	SCOT	80
9	N	GBBG	1
9	N	SCOT	2000*
9	N	HEGU	6

Note: Transect 1 through 9 is from west to east of the bay.

* Some may include some birds counted on the first leg of the survey

Legend

Abbreviation	Species
COLO	Common Loon
CORM	Cormorant
EIDR	Eiders
GAN	Northern gannett
GBBG	Great black-backed gull
GULL	Gull species
HEGU	Herring gull
LOON	Loon species
RZB	Razorbills
SCOT	Scoter species
SSC	Surf scoter
TERN	Tern species

FIGURES

Legend

- Route of aerial
- Additional route
- Transect

Fog

- No Visibility
- Low Visibility

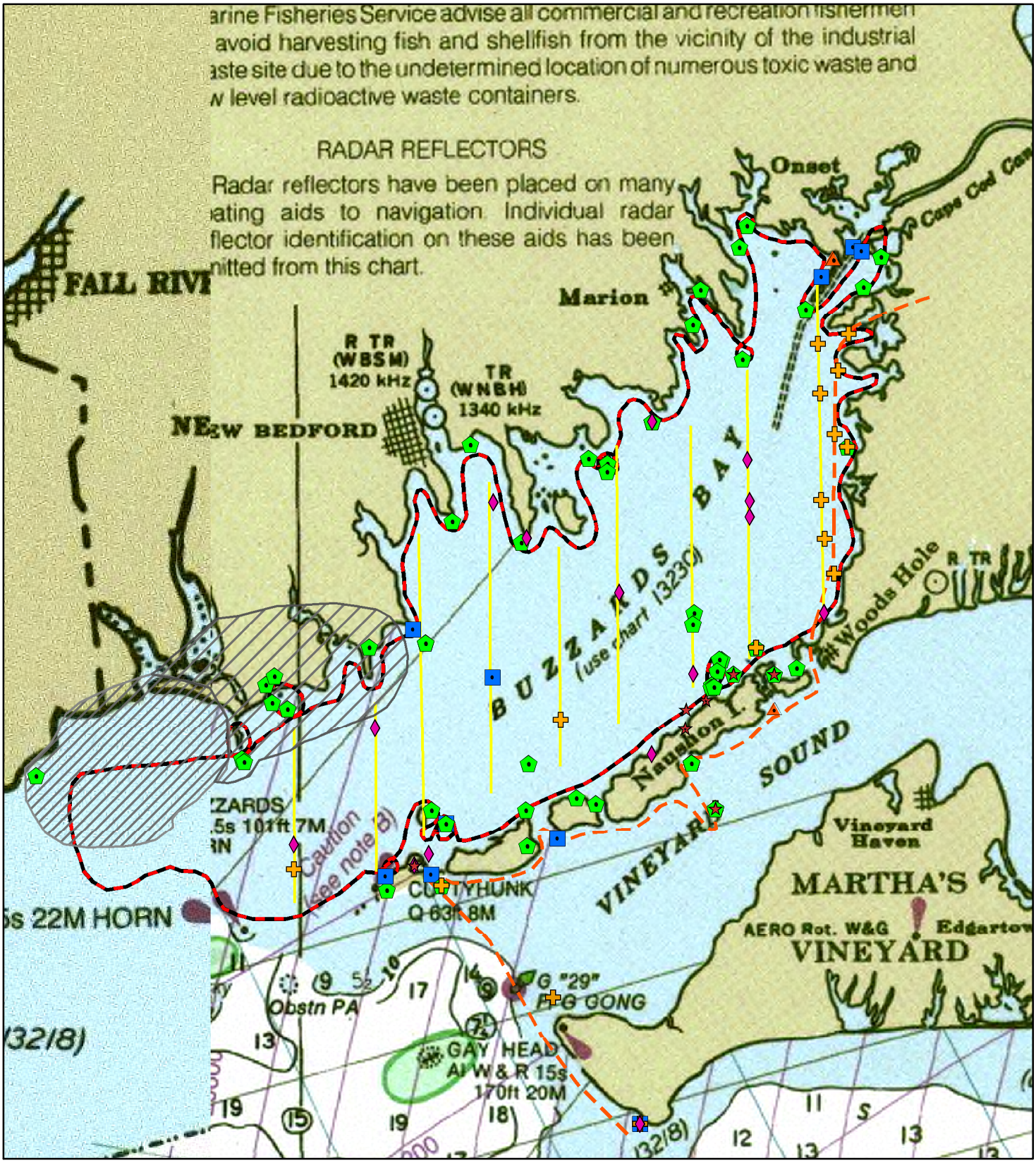
Left Observations	Right Observations	Transect Observations
1 - 40	1 - 40	1 - 6
41 - 120	41 - 150	7 - 20
121 - 250	151 - 300	21 - 80
	301 - 1000	81 - 400
	1001 - 2000	401 - 2000
	2001 - 4000	

Figure 1
Spatial Summary
Buzzards Bay Aerial Bird Survey
May 2, 2003

Draft - Work In Progress

Note: Route and bird locations are approximate.
Some of the plotted points combine observations for a larger area.

Map Document: (J:\Arcview\7079607 - BuzzardsBaySpill\Bird Route Project.mxd)
8/28/2003 – 10:02:12 AM



Legend

- Route of aerial
- Additional route
- Transect

SPECIES

- Loon
- Scoter
- Bufflehead
- Merganzer
- Eider
- Cormorant

Fog

- No Visibility
- Low Visibility

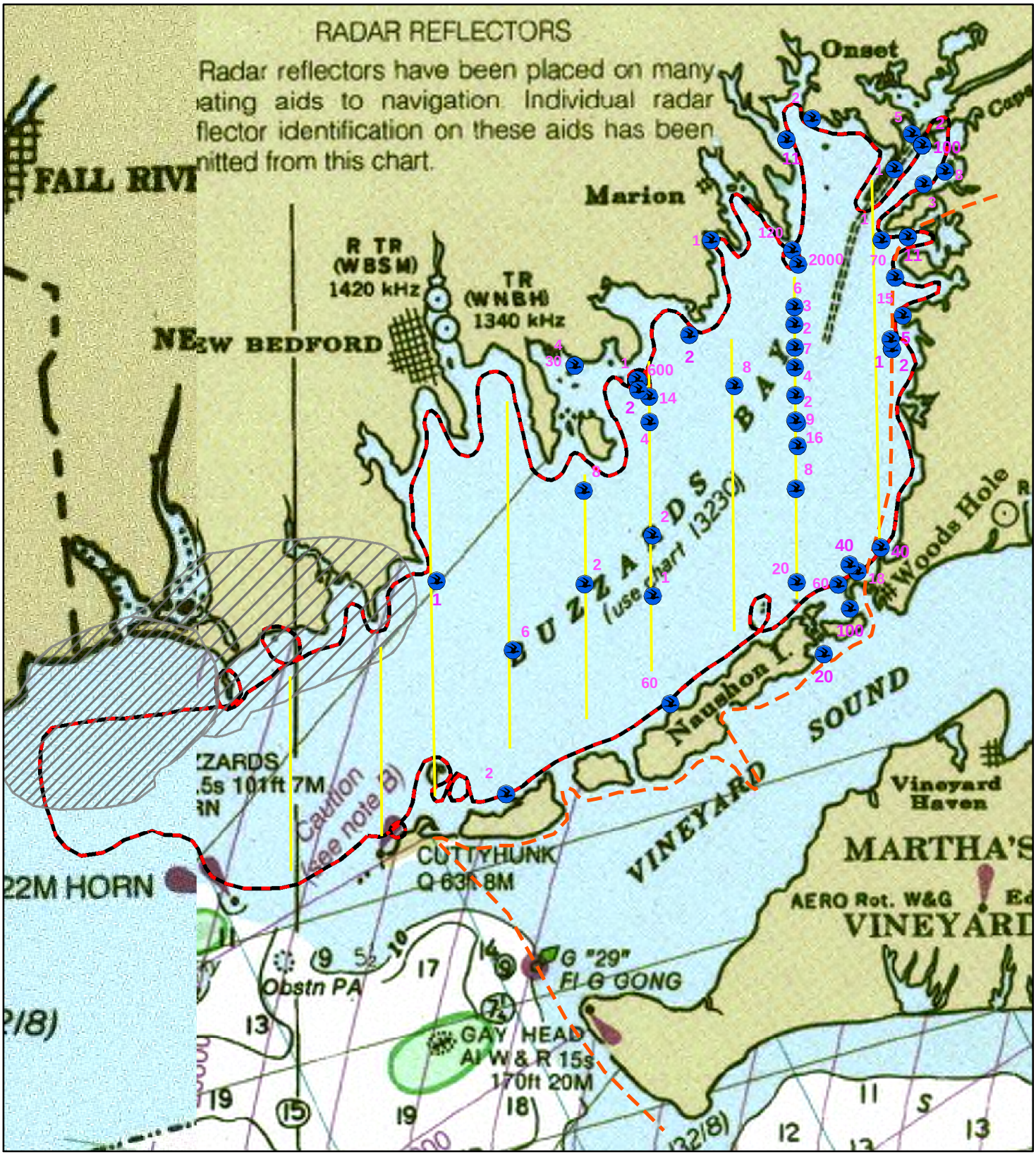
0 5 10 Miles

N

Figure 2
Species Organized by Spatial Distribution
Buzzards Bay Aerial Bird Survey
May 2, 2003
Draft - Work In Progress

Note: Route and bird locations are approximate.
Some of the plotted points combine observations for a larger area.

Map Document: (J:\Arcview\7079607 - BuzzardsBaySpill\Bird Route Sp. Project.mxd)
8/28/2003 -- 9:57:53 AM



Legend

- Route of aerial
- Additional route
- Transect
- Tern
- 10 # of Individuals

Fog

- No Visibility
- Low Visibility

0 5 10 Miles

N

Note: Route and bird locations are approximate.
Some of the plotted points combine observations for a larger area.

Figure 3
Tern Spatial Distribution
and Number of Individuals
Buzzards Bay Aerial Bird Survey
May 2, 2003
Draft - Work In Progress

Map Document: (J:\Arcview\7079607 - BuzzardsBaySpill\Bird Route Tern Project.mxd)
8/28/2003 -- 10:03:59 AM

APPENDIX G

GUIDELINES FOR RESPONSE ACTIONS IN AREAS OF HISTORIC, ARCHAEOLOGICAL AND CULTURAL RESOURCES

Guidelines for Response Actions in Areas of Historic, Archaeological and Cultural Resources
Bouchard Tank Barge 120 Oil Spill, Buzzards Bay
May 09, 2003

This document provides an assessment of the potential effects of the emergency response phase of the clean-up of the Bouchard Tank Barge 120 oil spill on the historical and archaeological resources of the State of Massachusetts. Development of this document took place through consultation with the Massachusetts Historical Commission. Application of this document fulfills the requirements of the United States Coast Guard as the lead Federal Agency under the Programmatic Agreement on Protection of Historic Properties During Emergency Response Under the National Oil and Hazardous Substances Pollution Contingency Plan, Section VI, part D.

SAND BEACHES

1. Manual removal of surface oil and oiled wrack is not expected to impact historic resources. Sand removal will be limited to the oiled layer only and is not expected to be more than 2 inches. This removal will be confined to that section of the beach that is routinely reworked by wave action.

Oiled wrack removal using beach-raking machines may be conducted only with the approval of the Unified Command (UC). The beach raking machines will be confined to the area of the supra tidal, and will remove the oiled wrack and a small amount of sand. This action will take place in that section of the beach that is routinely reworked by wave action and is not expected to impact historic resources.

REMOVAL OF BURIED OIL

2. Shallow pits (1 foot) will be dug at the high tide line to locate and delineate areas of buried oil. Once the buried oil is located, the clean overburden will be carefully removed. This clean sand will be returned to the site once the oiled sediment is removed. This removal will be confined to that section of the beach that is routinely reworked by wave action. Impacts to historic resources are not expected.

MIXED SAND & GRAVEL, GRAVEL AND RIP RAP GROINS (JETTIES)

3. Clean-up crews will manually remove as much surface oil as possible using absorbent material, rakes, and shovels. Limited sediment removal will take place in these areas and no rocks will be removed. In areas where it is necessary to have a higher standard of oil removal, high pressure and hot water flushing may be used with UC approval. The lowest water pressure and temperature that is effective will be used. This activity will heat the weathered oil and forcefully remove the oil from the rock. The force of the water could churn-up small grained sediments. However, impacts to historic resources are not expected, as this clean-up activity will be confined to the area of the beach that is routinely worked by wave action. Oiled wrack removal using beach-raking machines may be conducted only with the approval of the UC. Many of the beaches in the area are routinely raked for the enjoyment of beach goers. The beach raking machines will be confined to the area of the high tide, and will remove the oiled wrack and a small amount of sand and gravel. This action will take place in that section of the beach that is routinely reworked by wave action and is not expected to impact historic resources.

RIP RAP, SEAWALLS, BULKHEADS, PIERS, DOCKS AND PILINGS

4. Clean-up crews will manually remove as much oil as possible using absorbent material, rakes, and shovels. Limited sediment removal will take place in these areas. In areas where it is necessary to have a higher standard of oil removal, high pressure and/or hot water flushing maybe used with UC approval. The lowest water pressure and temperature that is effective will be used. This activity will heat the weathered oil and forcefully remove the oil from the rock. The force of the water could churn-up small grained sediments. Impacts to historic resources are not expected, as this activity will be confined to areas of recently man-made structures.

These types of manmade structures can be historic properties. The MA State Historic Preservation Officer listed two historic man-made structures in the impacted zone of Massachusetts: Fort Rodman and Fort Phoenix. Response workers are not to climb on or over, attach any lines or booms or otherwise come into contact with these structures. The MA SHPO must be contacted prior to cleanup of these structures, if clean-up is warranted.

ROCKY SHORELINES

5. Clean-up crews will manually remove as much oil as possible using absorbent material. Oiled wrack will be manually removed. In areas where it is necessary to have a higher standard of oil removal, high pressure and/or hot water flushing maybe used with UC approval. The lowest water pressure and temperature that is effective will be used. This activity will heat the weathered oil and forcefully remove the oil from the rock. Chemical Shoreline Cleaning Agents may be necessary for the removal of weathered oil. The use of these agents must be approved by the UC. Based on communications with the MA Historical Preservation and Heritage Commission there appears to be no known historic sites within this type of environment.

SALT MARSHES

6. Patches of oil that are found in the marsh will be removed using shovels and rakes, under the direct supervision of Environmental Unit personnel. Sediment or plant removal will not take place in these environments. Although there is the potential for historic resources to be found in salt marshes, no sediment will be removed. For this reason, impacts to historic resources are not expected.

DUNE ACCESS

7. Activity in the dunes has been restricted to all response workers. Access to the beach will take place on existing trails and roads only. No roads or trails will be made during the response.

STAGING AREAS

8. The use of paved parking lots and roadbeds are the preferred staging and parking areas. If the use of unpaved areas is required for the collection or storage of oily materials, an impervious barrier shall be placed on the ground. Care should be used to ensure that the ground surface is not disturbed.

After consultation with Mr. Ed Bell of the Massachusetts Historical Commission the Unified Command understands that cleanup in the tidal zone should not affect any historic, archaeological, or cultural resources. Should cleanup operations need to be conducted in any areas above the tidal zone the SHPO must be contacted for consultation. If during cleanup operations in the tidal zone workers uncover timbers that appear to be from sunken ships, the SHPO requests the supervisors in the field inform his office at (617) 727-8470. If human remains are found contact the local police authorities and Dr. Ann Marie Mires at (617) 267-6767 (176)

If actions other than the ones listed in this document are necessary for the successful clean-up of the Bouchard Barge 120 spill, the FOSC (or designee) shall contact the MA SHPO (or designee) on a case by case basis as needed

_____ Initial as received
Mary Landry
Captain, US Coast Guard
Federal On Scene Coordinator (FOSC)

_____ Initial as received
Ed Bell
Massachusetts Historical Commission.

_____ Initial as received
Robert Donovan
Massachusetts Department of Environmental Management
State On-Scene Coordinator (SOSC)

_____ Initial as received
Steve Lehmann
National Oceanographic Atmospheric Administration (NOAA)
Scientific Support Coordinator (SSC)

_____ Initial as received
Dave Barry
Bouchard Transportation Co., Inc.
Responsible Party (RP)