BOUCHARD BARGE 120 (BUZZARDS BAY) OIL SPILL
NATURAL RESOURCE DAMAGE ASSESSMENT AND RESTORATION

RARE BEETLE PREASSESSMENT SCREENING
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1.0 INTRODUCTION

The Joint Assessment Team identified two beetle species as resources of potential concern: the American burying beetle (*Nicrophorus americanus*) and the northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*). Both of these species are federally listed under the Endangered Species Act (16 U.S.C. 1531 *et seq.*)—the tiger beetle is listed as threatened, while the burying beetle is endangered. Both are listed as endangered in Massachusetts (321 CMR 10.00 *et seq.*) During the oil spill, shorelines in beach tiger beetle habitat and in the vicinity of American burying beetle habitat were oiled to various degrees. Potential injury pathways include direct oiling of individuals, oil ingestion, and oil cleanup activities that may have harmed individuals or their habitats. This document evaluates the potential for natural resource injury to rare beetles.

2.0 PREASSESSMENT SCREENING

In the Preassessment Phase of natural resource damage assessment, the Natural Resource Trustees determine if they have jurisdiction to pursue restoration under the Oil Pollution Act (OPA), and if so, whether it is appropriate to do so. The criteria that must be satisfied in order to meet these two thresholds are described in the OPA NRDA regulations, 15 CFR Part 990 Subpart D. If both thresholds are satisfied, the Trustees can move forward with an injury assessment (a.k.a., Restoration Planning) for beetles.

The Trustees determined that they have jurisdiction to pursue restoration, because a non-exempt oil spill incident occurred that may have injured natural resources (e.g., rare beetles) under the trusteeship of the Trustee agencies. Determining the second threshold requires a review of pre-existing data to, among other objectives, determine whether injuries have resulted, or are likely to result, from the incident. The primary goal of this document is to describe such data reviews for both beetle species and to make a final recommendation on the determination to conduct restoration planning for beetles.

2.1 AMERICAN BURYING BEETLE

The American burying beetle is located in two areas where some limited oiling is reported to have occurred: Block and Penikese Islands. Shoreline at Block Island received oiling ranging from very light to moderate in the areas for which oiling data exists. Penikese Island received very light oiling. Cleanup activities in these areas on both islands were conducted below the high tide line using manual removal techniques and generally did not stray into the upland areas.

The burying beetle primarily uses upland shrub/grassland habitats and does not come out of winter dormancy until night temperatures are sustained above upper 50s / lower 60s degrees Fahrenheit. However, once active, the burying beetle seeks out carrion which are buried for brood-rearing, mostly during June and July on Block Island (USFWS 1991). When not engaged in brood-rearing, adults feed on a broad range of carrion. The optimum weight of carrion for breeding purposes is 100 to 200 grams, about the size of a belted kingfisher, herring gull chick, or mourning dove.

American burying beetles in the Buzzards Bay area came out of winter dormancy around the beginning of June 2003. Night time temperatures on Block and Penikese Islands reached an average temperature of more than 55°F (moving average using an interval of 3 days) on June 9, 2003 (based on data from the Block Island Airport) and approximately June 14, 2004 (based on data from the Martha's Vineyard Airport), respectively. The night time temperature first reached 55°F on May 31, 2003 for Block Island and on June 5, 2003 for Penikese Island. Endangered Species Biologists from the U.S. Fish and Wildlife Service and the Rhode Island Division of Fish and Wildlife observed about 40 burying beetles on Block Island during the week of June 9-13, 2004 (Raithel 2004). Thus, there is evidence that some of Block Island's burying beetles became active during or before the work week ending June 13, 2003. Beetle surveys on Penikese Island, normally performed by the tern monitors on the island, did not occur in 2003 during the optimal sampling window of mid-June to early July, due to the increased effort required of the tern monitors to document the effects of the oil spill on terns. It is likely that burying beetles on Penikese Island became active a short time after Block Island beetles did.

The American burying beetle is not usually associated with coastal shoreline habitats, and particularly intertidal habitats, on Block and Penikese Islands. Thus, it is not likely that direct oiling or cleanup activity affected individuals on Block and Penikese Islands.

To assess the potential for burying beetles to encounter oiled bird carcasses, data on the prevalence of oiled carcasses on islands were evaluated. The Sub-team reviewed the carcass recovery database, carcass search effort database, SCAT documentation, and other wildlife recovery documentation. Tables 1 and 2 list the carcasses collected or observed and the debilitated birds collected from the shorelines of Block and Penikese Islands.

No information is available on the occurrence of oiled bird carcasses within upland areas of the islands, where burying beetles would be most likely to encounter oiled carcasses if at all. Oiled birds could have flown to the interior of Block and Penikese Islands and died there any time after April 27, 2003. However, direct observation of these areas was not performed as part of the spill response.

Nevertheless, it can be surmised that the likelihood of American burying beetles encountering oiled, 100-200g carcasses in the upland areas of Block and Penikese Islands was low. Of the carcasses collected from all of Buzzards Bay from the time of the spill until June 18, 2003, only three species (i.e., common tern, roseate tern, and a species of yellowlegs) were of the optimum size class for burying beetle reproduction. These three species comprise less than 15 total carcasses and approximately 3% of all dead birds

Table 1: Bird/carcass information for Block Island shorelines, 2003.

Date	*Carcasses Observed*	*Live Debilitated Birds Collected*
5/19	1 common loon, unk. oiling	0
5/20	1 great black-backed gull, unk. oiling 3 herring gulls, unk. oiling 1 unidentified bird, unk. oiling	0
5/21	1 unidentified bird, unk. oiling	0
5/22*	0	0
5/23	1 common eider, unk. oiling 1 common loon, unk. oiling 2 great black-backed gulls, unk. oiling 1 razorbill, unk. oiling 1 red-necked grebe, unk. oiling	0
5/25	1 razorbill, unk. oiling	0
5/30	2 black-backed gulls, 1 common eider, not oiled 2 unidentified gulls, 1 unidentified loon, oiled 1 unidentified seabird, oiled	0
6/3	1 common loon, not oiled 2 red-necked grebes, not oiled	0
6/17	1 unidentified seabird, oiled 1 unidentified egret, oiled 1 unidentified grebe, unk. oiling 1 unidentified gull, unk. oiling 1 greater shearwater, unk. oiling	0

*SCAT search performed, found nothing.

collected in Buzzards Bay. Only three of the 15 carcasses (only one known to be oiled) were collected from the burying beetle islands (i.e., Penikese Island), and these were collected in late May, before burying beetles would have been active. Thus, it may have been possible that burying beetles encountered oiled bird carcasses within their upland habitat on Block Island, but it was not likely, due to the small number of oiled, 100-200g carcasses that may have been present within beetle habitat. On Penikese Island, the chance that burying beetles may have encountered dead small birds was slightly greater than on Block Island, due to the presence of the tern and gull colonies on the relatively small island. However, the natural mortalities generally associated with tern and gull nesting colonies, combined with the relatively low numbers of burying beetles on Penikese Island, reduces the chance that burying beetles on Penikese Island encountered any *oiled* carcasses, large or small.

In summary, it is not likely that American burying beetles suffered exposure to oil within Buzzards Bay due to the Bouchard 120 oil spill.

Table 2: Bird/carcass information for Penikese Island shorelines, 2003.

Date	*Carcasses Observed*	*Live Debilitated Birds Collected*
4/30	0	1 common loon, oiled
5/1	1 common eider, unk. oiling	0
5/4	0	1 common eider, oiled
5/7	1 common loon, unk. oiling 1 common eider, unk. oiling	0
5/10	1 herring gull, unk. oiling	0
5/11	1 common eider, unk. oiling	1 common eider, oiled
5/14	1 common eider, unk. oiling	0
5/16	1 common eider, unk. oiling	0
5/27	1 red-necked grebe, unk. oiling 1 red-throated loon, unk. oiling	0
5/30	1 common tern, oiled	0
5/31	1 common eider, unk. oiling 2 common terns, unk. oiling	0
6/5	0	1 herring gull, not oiled

2.2 NORTHEASTERN BEACH TIGER BEETLE

The northeastern beach tiger beetle is located at several sites in Massachusetts. The only beach known to be inhabited by northeastern beach tiger beetles and also known to have been impacted by oil is the western half of Horseneck Beach (a.k.a., Westport Town Beach). The maximum degree of oiling in this area ranged from very light to moderate and affected the intertidal zone.

At Westport Town Beach, adult beetles dwell on sandy beaches at and above the high tide line, although they may also be found at the toe of the dunes. Adults typically remain dormant until mid- to late-June, after which time they emerge from the sand to feed, mate, and lay eggs (USFWS 1994). The peak period of adult activities is in mid-July. Larvae inhabit burrows in the intertidal and supratidal areas. Larvae generally overwinter in supratidal areas, but move toward the upper intertidal zone by early summer. Second and third instars (from the same cohort) emerge from winter hibernation in mid-March and resume hunting surface arthropods from burrows. On Martha's Vineyard, Simmons et al. (1996) encountered tiger beetle larvae in deep burrows (up to three feet deep) above the high tide line at the foot of dunes and in dune blowouts during mid-May. No larvae were found active in April. Both adults and larvae feed upon small arthropods.

The major concerns regarding the northeastern beach tiger beetle and the oil spill involve potential direct oiling of beetles, potential consumption of oiled prey, potential reduction of prey, and potential mortality caused by cleanup activities.

Direct Oiling of Adults and Larvae

To investigate potential oiling of either larvae or adults, the BWAT reviewed data from all SCAT surveys that describe oiling in the area of Westport Town Beach. These data, listed in Table 3, indicate that very light to light oiling occurred primarily in the intertidal zone in the area of northeastern beach tiger beetle habitat. No buried oil or buried oily wrack was reported for this area. Additional information on the presence of oil was found in the plover monitoring datasheets. Observations of sporadic tarballs were reported on June 29 and July 28, 2003. However, there were several reports of "no oil observed" during the month of July 2003 and through to August 13, 2003.

Since there was extremely little, if any, oil present or buried on the beach during June and July, it was unlikely that adult beetles would have suffered direct oiling. Larvae that may have become active in mid- to late-March, could have encountered oil during the spill, but the chances would have been slim. Oil would have had to come to rest on top of a burrow in order to cause an adverse effect to larvae. When present, oil generally covered less than one percent of the intertidal zone. Thus, the chance for oil to encounter the relatively few larval burrows that may have been in the area would have been small. It was also not likely that larvae migrating with the accretion and erosion of the beach would have encountered buried oil.

Table 3: SCAT data for Northeastern Beach Tiger Beetle Habitat

Date / Reference	*Oiling Data*
5/1/03 P52	1-2 mm tarballs comprise swash lines of oil from high tide line to low tide line (a 10 yard width). <1% coverage of intertidal zone, for 1700 yards along beach. Oiling category: Light.
5/7/03 P162	Very lightly oiled wrack. Oiling category: Very Light
5/10/03 P199	Trenched intertidal zone in several places looking for buried oil – none found. Dug 6-10" below grade. On surface, oil speckles in 1-5 ft width of <1% coverage. Cleanup crews picking up oil. Oiling category: Very Light
5/11/03 P204	A few small tar patties found. <1% coverage of intertidal zone. Cleanup crews present looking for oil. Oiling category: Very Light
5/28/03 P454	A few small tarballs found. <1% coverage of intertidal zone. Cleanup crews present looking for oil. Oiling category: Very Light
6/2/03 P511, plover survey datasheet	A few tar patties found within the symbolically fenced area, reported by plover monitor.
6/4/03 P523	No oil present.
6/10/03 IRAC form	Segment met IRAC endpoint (i.e., no visible surface or subsurface oil).

Consumption of Oiled Prey / Reduction of Prey

Both adults and larvae consume small arthropods (e.g., flies, amphipods) from the beach surface. These highly mobile prey could have picked up oil from the beach, becoming a consumption hazard for tiger beetles. Amphipods are generally concentrated in wrack at the high tide line or in the supratidal zone. Amphipods in the wrack at the high tide line may have been removed by cleanup crews with oiled wrack. Thus, it is possible that the forage base for northeastern beach tiger beetles was impacted by either contamination or removal.

This potential loss of foraging opportunity is better assessed in the context of losses of ecological services provided by the beach rather than as a loss of northeastern beach tiger beetle individuals.

Mortality Caused by Cleanup Activities

At the time of the spill and response, larvae were located in the frontal dune and the dune grass and beach interface. These areas were symbolically fenced for the protection of nesting piping plovers during the response and received little or no foot or vehicle traffic by cleanup personnel. Adult beetles did not emerge to the beach surface until July or August. By that time, response activities were largely completed in the area of northeastern beach tiger beetle habitat. Thus, it was not likely that mortality was caused by cleanup activities.

3.0 SUMMARY AND CONCLUSIONS

The Rare Beetle Assessment Sub-team concludes that no directly quantifiable natural resource injury likely occurred to American burying beetles due to the B-120 oil spill or response. No direct injury occurred to northeastern beach tiger beetles via direct oiling or cleanup activity. However, the prey base for northeastern beach tiger beetles was possibly impacted either by contamination of the prey or by the reduction of the prey population.

This potential loss of foraging opportunity is better assessed in the context of losses of ecological services provided by the beach rather than as a loss of northeastern beach tiger beetle individuals. Restoration projects considered as compensation for shoreline and intertidal impacts associated with the Bouchard 120 oil spill should include potential benefits to the northeastern beach tiger beetle as one of the evaluation criteria in project selection. No other injury assessment activities involving beetles is necessary.

4.0 REFERENCES

Nothnagle, P., P. Goldstein, and T. Simmons. 1997. *Cicindela dorsalis* Population and Habitat Conditions on Martha's Vineyard 1996. 1996 Final Report submitted to the Massachusetts Natural Heritage Program. 13 pp.

Raithel, C. 2004. Performance Report, Monitoring and Management of American Burying beetle, 1 April 2003 to 31 March 2004. A report to the U.S. Fish and Wildlife Service pursuant to Section 6 of the Endangered Species Act. 11 pp.

U.S. Fish and Wildlife Service (USFWS). 1994. Northeastern Beach Tiger Beetle (*Cicindela dorsalis dorsalis* Say) Recovery Plan. Newton Corner, Massachusetts. 60 pp.

U.S. Fish and Wildlife Service (USFWS). 1991. American Burying Beetle (*Nicrophorus americanus*) Recovery Plan. Newton Corner, Massachusetts. 80 pp.