WILDLIFE INJURY ASSESSMENT PLAN FOR THE CHALK POINT OIL SPILL

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1.0 Introduction

On April 7, 2000, approximately 126,000 gallons of a mixture of #2 and #6 fuel oil were released from a break in a pipeline providing fuel to the Chalk Point Generating Station. The pipeline is owned by the Potomac Electric Power Company (PEPCO) and operated by Support Terminal Services Operating Partnership, LLP (ST Services). The spill initially leaked into Swanson Creek and the surrounding tidal wetlands. On April 8, high winds, rain, and tides resulted in the oil being spread approximately 17 linear miles downstream in the Patuxent River and into several downstream tributaries, including Indian Creek, Trent Hall Creek, Washington Creek, and Cremona Creek, oiling approximately 40 miles of shoreline.

The spill zone includes several types of habitat including openwater, tidal wetlands, fringing wetlands and sandy shoreline. Shoreline and aerial avian surveys indicated that over 1000 migratory and resident birds were present in the impacted area during the spill event, including ruddy ducks, grebes, buffleheads, cormorants, osprey, great blue herons and bald eagles.

Physical oiling often results in the loss of the insulative properties of the feathers and fur of wildlife; this can lead to hypothermia, stress, starvation and can ultimately result in the death of an animal. Consequently, those animals that spend a majority of their time in or on the water, e.g., diving ducks, are particularly susceptible. Ingestion of oil due to preening of feathers and fur can also result in toxic effects to wildlife. Approximately 180 oiled birds, mammals, and reptiles died as a result of the Chalk Point spill (USFWS 2000). Ruddy ducks and muskrats suffered the highest mortalities. Many more animals, particularly birds, were observed to be oiled but were too active to be retrieved. Based on experience at previous oil spills, it is suspected that some portion of these living yet oiled animals

eventually died due to oiling. In addition, there was potentially a large number of dead and oiled animals that were not found by the responders.

In addition to the direct impacts to wildlife, the Trustees are also concerned about the potential effects on the reproductive success of avian species, including bald eagles, osprey and great blue herons, that were nesting in the area when the spill occurred. The foraging strategy of these species and willingness to enter water and wetlands make them susceptible to oiling. Adults that become oiled may transfer the oil from their plumage to their eggs during incubation. Refined oil is highly toxic to avian embryos. In addition, the oil spill may have reduced or contaminated the prey base of these species, with ultimate effects on reproductive success.

2.0 Objective

The objective of the wildlife injury assessment is to determine the magnitude and extent of injury to wildlife receptors nesting or foraging in or near the spill zone during or shortly after the spill. Results will be used to assist in determining the level and form of compensation necessary to replace wildlife losses resulting from the spill.

3.0 Study Approach

The methodology for this assessment plan was developed cooperatively by the wildlife assessment team consisting of personnel from PEPCO, the U.S. Fish and Wildlife Service (USFWS), the Maryland Department of Natural Resources (MDNR), the U.S. Geological Survey's (USGS) Patuxent Wildlife Research Center, and the Nanjemoy Environmental Education Center (NCEEC). The National Oceanic and Atmospheric Administration (NOAA) and the Maryland Department of the Environment (MDE) also provided input to this document.

Wildlife species included for injury assessment were chosen based on proximity of breeding or foraging populations to the spill zone, frequency of observed oiling to individuals and their habitats, and/or availability of historical data and assessment methods. Based on these criteria the wildlife assessment focuses on the following species and species assemblages: ospreys (*Pandion haliaetus*), great blue herons (*Ardea herodias*), bald eagles (*Haliaeetus leucocephalus*), furbearers, and waterfowl.

The injury assessment includes two approaches, one based on observations of oiled wildlife, the number of rehabilitated wildlife and mortality counts to estimate direct impacts (furbearers and waterfowl); the second, monitoring studies designed to evaluate the potential impacts on reproductive success (ospreys, great blue herons and bald eagles).

3.1 Furbearers

An independent wetland consultant characterized Swanson Creek marsh and provided benchmarks for restoration success as it relates to furbearers and other wildlife. In addition, representatives from a local furbearer organization inspected the spill impacted areas of the marsh and provided the MDNR with estimates concerning pre- and post-spill populations in the spill zone.

Furbearer losses in wetlands (focusing mainly on muskrats [*Ondatra zibethica*]) will be estimated using oiled wildlife mortality counts maintained by the USFWS during the response, post-spill furbearer organization survey results, historical surveys from other areas, and the literature. The NRDA wildlife assessment team expects to rely heavily on NRDA Wetland Habitat Assessment results, including reference marsh comparisons, to determine the period of injury and recovery time for furbearer populations.

3.2. Waterfowl

Aerial and shoreline surveys indicated that many species of resident and migratory waterfowl were present in the impacted area during the spill, including cormorants, coots, mallards, canvasbacks, mute swans and over 700 ruddy ducks. In addition, shoreline surveys also provide an estimate of the proportion of observed animals that were oiled. As part of response efforts, the USFWS produced a technical report summarizing these wildlife observations, the aerial overflight data and wildlife mortality counts (USFWS 2000). This report, in conjunction with information in the literature on the recovery rates of dead and oiled waterfowl in other spills, will serve as the foundation for the injury assessment to local populations of waterfowl species, particularly ruddy ducks.

3.3 Ospreys

Steve Cardano of the Nanjemoy Creek Environmental Education Center (NCEEC) and Ann Wearmouth of PEPCO located and inspected 37 active nesting pairs from Truman point to Cremona (the "middle river" area including most of the spill zone) several times immediately following the spill. During their inspections, they observed 6 oiled adults, four of which were later rehabilitated and released. The four rehabilitated ospreys were from nests at Chalk Point and the electrical towers upstream of Swanson Creek on the Patuxent River. One of the rehabilitated tower ospreys was later found dead. A total of six oiled eggs were found in the two nests. The fifth and sixth oiled adults were observed at Hunting Creek and Indian Creek.

In order to evaluate potential impacts on reproductive success, nests were revisited every two weeks until fledging occurs (usually in August). Nest inspections consisted of counting and recording live young and eggs. Counts were accomplished by visual examination from a boat or using a mirror attached to a pole using methods similar to those used by Reese (1977), Woodford et al. (1998), and proposed by

McGowan (USFWS 1998). Results for # of young, # of eggs/nest, % hatchability, and fledging success will be statistically compared to 25 years of historical data for the middle river area and to 2000 data from the upper river (above the spill zone and extending to Jug Bay) to determine whether the spill impacted the nesting population. Data from the approximately twenty upper river nests were collected by PEPCO and Greg Kearns of the Maryland Capitol Parks and Planning Commission (NCPPC). The locations of all nests were recorded using Global Positioning System units and mapped using GIS ARCVIEW. The only major deviation from methods described in the published literature is that the eggs were not numbered immediately following egg laying. Had this been done, it may have resulted in an easier, more accurate assessment of osprey productivity. However, comparisons to 25 years worth of historical data obtained using the same methods proposed herein should provide enough useful information to enable statistical analysis and the formulation of conclusions regarding effects of the spill on osprey productivity.

In late June, the young were banded. During banding, chicks will be weighed, subjected to Body Condition Indexing (BCI), and examined for external abnormalities. This information will be used as an adjunct to population assessment. The BCI is a subjective measure of body condition or robustness of an individual bird. The pectoral muscles and keel (breast bone) are palpated and assessed on a numeric scale of 1-5: 1 = emaciated, 2 = thin, 3 = average, 4 = above average, 5 = robust. Used in conjunction with weight and visual inspection, it offers additional information to assess overall condition of the bird. Data sheets for health assessment will be included for ease of recording this information. Used with population, hatching, and fledging success this information will assist trustees in overall assessment of osprey status in the area of the oil spill and at a reference site above the spill site.

Statistical Analysis: Nest and fledging success will be analyzed using the Mayfield method(Bart and Robson 1982) to compare middle and upper river areas to historical data. Categorical measures of productivity (# young per nest, # eggs per nest, % hatchability) will be analyzed with contingency table methods (Stokes et al. 1995). Differences between the mean BCI and weight data for the impacted and reference areas will be evaluated via ANOVA or the non-parameteric equivalent. Future monitoring needs will be determined based on the results of the 2000 monitoring. If statistically significant effects are identified, it may be necessary to perform similar monitoring in 2001.

3.4 Great Blue Herons

Craig Koppie (USFWS), Ann Wearmouth, and Mark Causey (heron consultant/climber) inspected the heronry on Swanson Creek on April 19 and April 20, 2000. A total of 34 nests were counted. Of the 34 nests, 17 were accessible to the climbers. Thirteen out of 17 nests contained chicks and/or eggs for a total of 18 chicks and 15 eggs. Three adult birds were observed to be oiled and all eggs appeared to be un-oiled. The Swanson Creek heronry was revisited by Craig Koppie, Dan Murphy (USFWS), and Mark Causey on of May 12, 2000 to begin nesting success monitoring. Of the 17 nests monitored, 10

contained a total of 20 living chicks and 7 were empty. No eggs were found. One dead chick was found on the ground and another was found in a nest. These were collected and frozen for future analysis (they were both judged to be too decomposed for necropsy).

A reference heronry on Swamp Creek, a tributary to the Patuxent River located four miles upstream of the mouth of Swanson Creek was visited on May 15, 2000 to establish reference conditions for statistical comparisons. A total of twenty nests were selected for monitoring. Fourteen of the nests were located in a single tree and were easily accessible to the climbers, and six, located in nearby trees, were chosen because the contents could be easily observed by the climbers. Eighteen of the twenty reference nests contained a total of 41 chicks.

The heronries were revisited weekly until fledging to monitor nesting success. Methods employed are similar to those used by Blus et al. (1997), Erwin et al. (1996), Parsons (1996), and Parsons and McColphin (1995). Results for # of young, eggs/nest, and fledging success at Swanson Creek will be compared to the literature and statistically to results from the reference heronry at Swamp Creek to assess detectable impacts on the nesting population.

There may be some difficulties associated with evaluating nesting success in the heronries. First of all, since heron egg laying began prior to the spill, the actual number of eggs initially laid in each nest is unknown. Secondly, great blue heron nests are relatively difficult to access, so marking individual eggs and nestlings to follow their progress over time is not feasible. However, Parsons (1996) and Parsons and McColphin (1995) were able to statistically compare productivity of two heronries using the average maximum number of young observed per nest and average number of young observed (per nest) at the age when they are capable of sustained flight. Hence, if results for the traditional parameters described above prove to be statistically unusable, we propose to use these metrics to compare productivity of the heronries at Swanson Creek and Swamp Creek.

In addition, the number of eggs lost due to oiling will be estimated by using the average number of eggs expected per nest (from the literature), the number of oiled adults and, a multiplier, determined by the Trustee Council.

Statistics: Nest and fledging success will be analyzed using the Mayfield method (Bart and Robson 1982) to compare Swanson Creek to Swamp Creek, if a sufficient number of visits are realized. At least 3 visits are required per nest in which the number of eggs or chicks are counted in each nest until the time of fledging. Categorical measures of productivity (# young per nest, # eggs per nest, % hatchability, average maximum number of young, and (if possible) average number of young at time of sustained flight) will be analyzed with contingency table methods (Stokes et al. 1995).

Adult site fidelity will be monitored in 2001 by counting the number of breeding pairs that return next spring. A large reduction in return breeders may be a result of the spill. Future monitoring needs will be determined based on the results of the 2000 and site fidelity monitoring. If statistically significant effects are identified, it may be necessary to perform similar monitoring in 2001.

3.5 Eagles

Three eagle nests located within the spill zone were inspected by USFWS following the spill. Upon initial inspection, the nest in Prince George's County on Swanson Creek contained two chicks that appeared normal and un-oiled. The adults at this nest were also un-oiled. During the week of May 1, this nest was revisited and appeared to have been blown from the tree by high winds. All that remained of the fledglings were several bloody feathers.

Although an adult pair of eagles had been observed to be nesting earlier in the year, the nest on the Charles County side of Swanson Creek contained no young. Eggs had been observed in the nest prior to the spill. It is assumed that the eggs failed to hatch and were eventually removed from the nest. The third nest, at Cremona in St. Mary's County, contained two fledglings that appeared healthy despite an odd coloration and two healthy, un-oiled adults.

Ann Wearmouth continued to observe the Cremona nest weekly until the fledglings left the area. Both nestlings successfully fledged and no signs of oiling were observed.

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