Draft Report
Survey of sea otters affected by the M/V Selendang Ayu fuel spill

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Summary

The wreck of the M/V Selendang Ayu near Skan Bay (west coast of Unalaska Island) and the resulting release of ca. 200,000 gallons of fuel oil placed an unknown number of sea otters at risk of oiling, debilitation and death. As a result, the USFWS asked International Wildlife Research (IWR) to prepare a plan to capture, stabilize and rehabilitate any otters that became oiled and debilitated. This report focuses on the search for sea otters in the area affected by the spill. In addition, we determined the minimum number of otters and their distribution in an area extending 13 miles north and south of the wreck along ca. 140 miles of coastline (from 53° 48.870' N, 167° 9.556' W to 53° 26.442' N, 167° 20.539' W) from January 11-20, 2005. We conducted the survey from a 17 ft aluminum skiff with assistance from a larger support vessel. When an otter was observed, we approached to within ca. 50 m and recorded the time, location and general behavior. In addition, we recorded the presence of other marine mammals and some bird species. We saw a total of 225 sea otters (ca. 1.6 otters per mile of coastline) of which 205 were adults and 20 (10% of total) were dependent pups. We observed sea otters throughout the survey area, although their distribution was not uniform. The highest concentrations were found in Anderson Bay, Makushin Bay and outer shore leading into Makushin Bay. In addition, many otters were observed in Kashega and Kismaluik Bays. Smaller numbers of otters were found in Skan Bay and Pumicestone Bay. In all cases, the animals actively avoided the skiff indicating that they were not lethargic, hypothermic or severely distressed as a result of oiling. Oiled beaches frequently occurred near habitat regularly used by and important to otters. Of special concern are heavily oiled shoreline in Humpback Bay, Portage Bay, Skan Bay and some areas of Kashega Bay. Even if some of these areas did not have many otters, remobilized oil can be carried by wind and waves into areas with high densities of otters. In addition, sea otters in the spill area move around frequently over an unknown range Although the greatest threat to sea otters is another release of fuel oil from the wreck, moderate and low level oiling may result from remobilization of oil from contaminated beaches due to storm generated waves and during beach cleaning operations in the spring. The rapid and unpredictable spread of oil once it is on the water poses a threat to otters throughout the area. To prevent further impacts on sea otters, we recommend that the response program 1) Prevent another release of oil from the wreck and remobilization of oil from contaminated shoreline, 2) Continue aerial monitoring of sea otters during the winter, 3) Maintain the sea otter capture capability, stabilization facility in Dutch Harbor and contingency plan for a rehabilitation facility, 4) Conduct another comprehensive, skiff-based survey of sea otters in the same area in the spring.

Background

Sea otters are the smallest marine mammal and rely entirely on their fur for thermal insulation in the marine environment. Fur is a major barrier to heat loss because it traps air next to the skin. Contamination of their fur with oil eliminates this air layer and reduces its thermal insulation by 70%. This increases heat loss and can result in lethal hypothermia (decrease in core body temperature). Depending on its composition, the toxic effects of petroleum hydrocarbons can also kill or debilitate sea otters. The wreck of the M/V Selendang Ayu (Figure 1) near Skan Bay (west coast of Unalaska Island) and the resulting release of ca. 200,000 gallons of IFO (Intermediate Fuel Oil) 380 placed an unknown number of sea otters at risk of oiling, debilitation and death (Figure 2). As a result, the USFWS asked International Wildlife Research (IWR) to prepare a plan to capture, stabilize and rehabilitate any otters that became oiled and debilitated. IWR prepared a three-part response plan: 1) Search the area potentially affected by the spill for oiled sea otters, 2) Assemble a stabilization facility in Dutch Harbor, and 3) Prepare contingency plans for setting up a rehabilitation facility. This report focuses on the search for sea otters in the area affected by the spill. In addition to searching for oiled sea otters, we determined the minimum number of otters and their distribution in an area 13 miles north and south of the wreck along ca. 140 miles of coastline. This information will be vital for assessing the vulnerability of otters to a new release of oil from the wreck and oil that is remobilized from heavily contaminated beaches.

Objectives

1. Locate and capture oiled and debilitated sea otters.
2. Determine the minimum number and distribution of sea otters along the coastline potentially affected by the release of fuel oil from the M/V Selendang Ayu
3. Assess the vulnerability of otters to an additional release of oil and/or oil that is remobilized from contaminated beaches.

Methods

We (R. Davis and F. Weltz) conducted a survey of sea otters along the west coast of Unalaska Island (from 53^{o} 48.870' N, 167^{o} 9.556' W to 53^{o} 26.442' N, 167^{o} 20.539' W) from January 11-20, 2005. The support vessel was the F/V Norseman, a 108 ft Marco crab fishing boat (Figure 3). We conducted the survey from a 17 ft aluminum skiff (Figure 4) during the late mornings and afternoons (1030-1700), which was the period of best light conditions. Weather conditions were generally good, and surveys were discontinued if the wind speed exceeded 15 knots and sea state was greater than Beaufort 3. On many days, wind speed was less than 5 knots and sea state was Beaufort 1-2. We motored about 200 m from the shoreline and scanned for otters from both sides of the skiff with and without binoculars (10 and 8 power). When an otter was observed, we approached to within ca. 50 m and recorded the time, location and general

behavior. In addition, we recorded the presence of other marine mammals and some bird species.

Results

Approximately 140 miles of coastline were surveyed during 10 days (Figure 5). We saw 225 sea otters (ca. 1.6 otters per mile of coastline) of which 205 were adults and 20 (10% of total) were dependent pups. The largest raft we saw was 16 otters at the north end of Peter Island in Anderson Bay. In all cases, the animals actively avoided the skiff indicating that they were not lethargic, hypothermic or severely distressed as a result of oiling. We saw no animals that behaved abnormally. However, on January 13 we observed a large area (ca. 0.3 square mile) of sheen at the entrance of Anderson Bay near Peter Island. In addition, at least one otter, three harbor seals and several birds were seen swimming in heavy sheen along the northwest coast of Peter Island. The sheen was not observed during resurveys of Peter Island on January 14 and 19, and no oiled and debilitated otters were observed. The following are specific survey descriptions by date. Numerical data are shown in their respective tables.

1. January 11, 2005: Anderson Bay, Naginak Cove and Udamak Cove (Table 1)

A total of 41 adults and seven pups was observed. Five of the seven pups were less than ca. one month old. Many of the otters occurred as single adults or mother/pup pairs. However, 22 otters including a single raft of 16 were seen very close to shore at the north end of Peter Island in Anderson Bay. This area is protected from winds and waves that arise at the head of the bay and may be a refuge that is attractive to females with pups. However, the north end of Peter Island also faces into Makushin Bay and is vulnerable to oil that is carried by wind or ocean currents into Anderson Bay. As a result, it is an area of high risk to otters and should be monitored.

2. January 12, 2005: Cannery Bay (Table 2)

We saw no sea otters or other marine mammals.

3. January 13, 2005: Peter Island in Anderson Bay (Table 3)

We approached the island from the northeast and observed four single adult otters and three females with very young (less than one month in age) pups. As we moved to the northwest side end of the island, we observed oil sheen and smelled petroleum. The prevailing wind and waves were from the northeast out of Portage Bay; this had also been the case the day before, but the wind had been much stronger (ca. 25 knots). We roughly mapped the location of the sheen, which may have covered an area of 0.3 square miles or greater. We then circled the island and observed another five adult otters. We returned to the Norseman to obtain I-Chem jars and sorbent material for sampling the sheen.

We relocated the sheen to the northwest of Peter Island and were preparing to take samples when we received a call from Beth Pattinson (USFWS). She, Joseph Connor and Scott Byrne (also USFWS) were inspecting the northwest shoreline of Peter Island (AND 2-3 on Peter Island; 53.69605 N, 166.84466 W) and observed heavy sheen in the cove and washing ashore. They had also seen three harbor seals, one sea otter, some Harlequin ducks and cormorants swimming in the sheen. We motored to the cove, observed the heavy sheen and took samples (two water samples and two samples using sorbent material). The samples were placed into new I-Chem jars. There were no otters in the cove, so we returned to the Norseman to contact USFWS.

On January 11, we had observed 23 adults and three pups around Peter Island, including a raft of 16 among the rocks on the northern coast of the island. Although we observed fewer animals during the present survey, these included three females with pups. Historical summer surveys had also reported many otters in the Peter Island area. This may be a sensitive area for otters that might be exposed to oil.

4. January 13, 2005: Humpback Bay (Table 4)

We saw no sea otters but observed one harbor seal. This area has some of the most heavily oiled beaches and is still being cleaned by shore teams.

5. January 14, 2005: Resurvey of Peter Island in Anderson Bay (Table 5)

We approached the island from the northwest and inspected the cove (AND 2-3 on Peter Island; 53.69605 N, 166.84466 W) in which heavy sheen oil had been observed the previous day. We saw no sheen on the water in the cove. It had either washed ashore or had been blown out of the cove. We circled the island and observed eight adult otters and two pups. All of the animals avoided the skiff and appeared to behave normally.

6. January 15, 2005: Skan Bay (Table 6)

A total of seven adult otters was observed. Skan Bay was the most heavily oiled area, and we found a couple of beaches that were covered with heavy black oil or mousse and did not appear to have been cleaned. As a result, these beaches are areas from which oil might be remobilized and present a high risk to otters. We saw many harbor seals, one of which was heavily oiled but behaved normally. We also saw several Steller sea lions. We passed the beach covered with soy beans from the wreck (strong smell). Sea gulls were on the beach, but we did not observe any marine mammals hauled out or along the shoreline. Based on its location, the wreck of the Selendang Ayu poses a serious risk to sea otters in the area until all fuel oil is removed.

7. January 16, 2005: Pumicestone Bay (Spray Cape to Kashega Point) (Table 7)

A total of eight adult otters and three pups was observed. We also saw many harbor seals, Steller sea lions and Emperor geese, none of which showed signs of oiling. The northeast coast of Pumicestone Bay has many rocky reefs and small islands among which sea otters could find refuge from wind and waves. Deeper in the bay, the terrain becomes steeper (deep water adjacent to the shore) until it shallows again near the head. We saw few signs of oil except for an oiled buoy that may have floated into the bay. However, Joseph Connor and his team (USFWS) found light oiling on a few beaches that faced into the entrance to the bay. Pumicestone Bay is close enough to the wreck of the Selendang Ayu that another release of oil could pose a serious risk to sea otters in this area. However, there is very little existing oil along the shoreline that could be remobilized.

8. January 17, 2005: Kashega Bay (Kashega Point to near Sedanka Point) (Table 8)

A total of 33 adult otters and six pups was observed. We also saw harbor seals, Steller sea lions, Emperor geese and Steller's Eiders, none of which showed signs of oiling. This appears to be good sea otter habitat because the bay is shallow and there are many rocky reefs and islands. We saw traces of sheen on the water, but no oil on the beaches. However, Joseph Connor and his team (USFWS) found tar balls and one area of black oil on a few beaches that faced into the entrance to the bay. Kashega Bay is close enough to the wreck of the Selendang Ayu that another release of oil could pose a serious risk to sea otters in this area.

9. Sea Otter Survey of North Shore of Makushin Bay (Humpback Bay to Makushin Point (Table 9)

We saw 18 adult sea otters and no pups. We saw some possibly signs of oiling along one beach

10. January 18, 2005: Portage Bay (Cathedral Rocks to Cannery Point) (Table 10)

Only one adult otter was observed. This area receives strong northeast winds that travel down the bay. On the same day as this survey, Joseph Connor and Scott Byrne (USFWS) observed heavy oil on the beach in area PTN 4 (central north coast of Portage Bay) that was producing sheen in the intertidal. We hypothesize that this is the source of sheen that was observed and threatened the sea otters on Peter Island on January 13. Until remediation is complete, this area of Portage Bay could be a source of sheen that could threaten sea otters at Peter Island, northern Anderson Bay and other areas in Makushin Bay throughout the winter.

11. January 19, 2005: Resurvey of Peter Island in Anderson Bay (Table 11)

We approached the island from the northwest and inspected the cove (AND 2-3 on Peter Island; 53.69605 N, 166.84466 W) in which heavy sheen oil had been observed the previous day. We saw no sheen on the water in the cove. We circled the island and observed four adults otters and one pup. None of the animals avoided the skiff and appeared to behave normally.

12. January 19, 2005: South Shore of Makushin Bay and the outer coast to the entrance of Skan Bay (Table 12)

We saw 22 adult sea otters and one pup. Sea conditions were excellent for the survey. This area would be vulnerable to oiling if there were another release from the wreck.

13. January 19, 2005: Volcano Bay and South Coast to Makushin Point (Table 13)

We saw 43 adult sea otters and 2 pups. Most of the otters were observed along the rocky coastline south of Volcano Bay to Makushin Point. This area would be vulnerable to oiling if there were another release from the wreck.

14. January 20, 2005: Kismaliuk Bay and entrance to Alimuda Bay (Table 14)

We saw 32 adult sea otters and two pups. This area would be vulnerable to oiling if there were another release from the wreck.

Conclusions

We began this survey one month after the wreck and oil release. Otters that are heavily oiled usually die within one to two days, and even moderately oiled otters may not live more than one week. Therefore, we can not be certain of the initial mortality of sea otters. Three oiled otter carcasses were recovered from the shoreline by other response teams. Other carcasses could have sunk or been carried to sea. It is noteworthy that Skan Bay, which was one of the most heavily oiled areas, had one of the lowest numbers of sea otters and yet was excellent otter habitat. During our survey, we observed no obviously oiled or debilitated otters. However, on January 13, at least one otter was swimming in heavy sheen. Subsequent surveys of Peter Island discovered no distressed animals. As a result, we made no capture attempts. In addition, we saw one heavily oiled harbor seal which behaved normally.

We observed sea otters throughout the survey area, although their distribution was not uniform. The highest concentrations were found in Anderson Bay, Makushin Bay and outer shore (Makushin Point to Volcano Bay and Staricakof Point) leading into Makushin Bay. In addition, many otters were observed in Kashega and Kismaluik Bays. Smaller numbers of otters were found in Skan Bay and Pumicestone Bay. A comparison of our surveys with those made by

others suggests that sea otters in the spill area move around frequently over an unknown range. Our repeated observations at Peter Island showed variation in the numbers indicating some individuals may have moved. Even when surveys show few animals near heavily oiled beaches, sea otters could easily move into these areas, so those oiled beaches pose a risk to otters.

Since our team worked from the same support vessel as a USFWS team doing beach surveys, we were made aware of many areas of mapped (Figure 6) and unmapped beach oiling which might threaten sea otters by direct contact or by oil remobilized into the water. Oiled beaches frequently occurred near habitat regularly used by and important to otters. Of special concern are heavily oiled shoreline in Humpback Bay, Portage Bay, Skan Bay and some areas of Kashega Bay. Even if some of these areas did not have many otters, remobilized oil from beaches in these areas can be carried by wind and waves into areas with high densities of otters. For example, we hypothesize that the oily sheen that affected otters at Peter Island and January 13 came from Portage Bay and was swept into the head of Anderson Bay by strong northeast winds.

Although the greatest threat to sea otters is another release of fuel oil from the wreck, moderate and low level oiling may result from remobilization of oil from contaminated beaches due to storm generated waves and during beach cleaning operations in the spring. Warmer temperatures in the summer may also contribute to oil leaching from contaminated beaches. In addition to oiling the fur, the toxic effects of chronic, sub-lethal oil exposure must be considered. Another concern is the chronic exposure of the fur to sheen oil leading to the eventual loss of insulation and subsequent hypothermia. As a result, every effort must be made to prevent remobilization of oil to prevent further internal and external impact on the otters in the spill area. The rapid and unpredictable spread of oil once it is on the water poses a threat to otters throughout the area we surveyed and possibly further north and south.

Recommendations

Implementation of the following recommendations will prevent further injury and mortality to sea otters:

1. Prevent another release of oil from the wreck and remobilization of oil from contaminated shoreline. This will require the removal of all fuel oil from the wreck and remediation of heavily oiled beaches. During beach remediation, any remobilized oil must be contained with boom and completely removed.

2. Continue aerial monitoring of otters and oiled shoreline during the winter

3. Maintain the sea otter capture capability, stabilization facility in Dutch Harbor and contingency plan for a rehabilitation facility.

4. Conduct another comprehensive, skiff-based survey of sea otters in the same area in the spring.