



Odiak Pond Stormwater Assessment

C O R D O V A A L A S K A

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EXECUTIVE SUMMARY

The purpose of this assessment is to characterize and quantify stormwater runoff and pollutants within the Odiak Pond watershed. Odiak Pond is a highly visible water body within the City of Cordova and is an important factor in maintaining a healthy, providing overwintering and rearing habitat for juvenile salmon. However, the presence of grasses and foreign vegetation in the Odiak Pond watershed is a sign of a damaged wetland system. Previous stormwater studies have identified fine-grain sediment, nutrients, hydrocarbons, and metals as pollutants likely present within the Odiak Pond watershed. Storm drain outfalls near the Cordova Community Medical Center, local snow storage areas, discharges to the stream flowing parallel to the Copper River Highway (Odiak Ponds largest tributary), and a capped landfill northwest of Odiak Pond have been previously identified as pollutant sources. Anecdotal evidence, along with historical aerial and satellite imagery, suggests that Odiak Pond has been gradually filling in with sediment and vegetation, gradually reducing the surface area and volume of the pond.

The Odiak Pond watershed is approximately 109 acres in size, of which approximately 60% of the watershed has been developed. Development consists primarily of residential properties, though scattered industrial, commercial, and park areas are also present. Four primary sub-watersheds drain to Odiak Pond, which is approximately 4.38 acres in size. Odiak Pond drains to Orca Inlet by way of Odiak Slough. Three culverts beneath the Copper River Watershed control flows out of Odiak Pond into Odiak Slough. The culverts are tidally influenced and likely present a barrier to fish passage.

Cordova has a maritime climate heavily influenced by the proximity of the Gulf of Alaska to the south and the heavily glaciated Chugach Mountains to the north. Annual precipitation is 162 inches, and with recorded annual precipitation ranging from 121 inches to 250 inches. The average annual temperature in Cordova is 41.9 degrees Fahrenheit. The annual average snowfall in Cordova is 101 inches, resulting in an average snowpack of 13 inches. Four weather stations are located in the Cordova vicinity providing climatic data, including precipitation, temperature, and snowfall accumulation.

This project establishes a water quality design storm flow to use for evaluating water quality treatment alternatives. The 2-year, 6-hour design storm values are recommended for use in

projects that will require State of Alaska Department of Environmental Conservation approval of stormwater improvements and where treatment effectiveness will be determined based on peak flows, such as bioswale design. The 90% capture rule is the recommended design approach for small, localized projects, such as rain gardens, to size stormwater treatment Best Management Practices. Odiak Pond sub-watershed sizes, 2-year, 6-hour peak flows, and 90% capture rule runoff volumes are shown in Table 1. Refer to Figure 1 for a map of sub-watersheds.

Table 1: Summary of Sub-Watershed 2-year, 6-hour Peak Flows and 90% Runoff Volumes

| Basin | Basin Area (acre) | 2-yr, 6-hr Peak Flow (90% Confidence Interval) | | | 90% Capture Volume (cf) | 90% Capture Volume (acre-ft) |
|-------|-------------------|--|---------------|------------|-------------------------|------------------------------|
| | | Low (cfs) | Average (cfs) | High (cfs) | | |
| 1a | 10.97 | 0.88 | 1.96 | 3.79 | 18959 | 0.44 |
| 1b | 12.73 | 2.42 | 4.15 | 6.83 | 24906 | 0.57 |
| 1 | 23.70 | 3.25 | 6.04 | 10.54 | 43865 | 1.01 |
| 2a | 18.56 | 1.92 | 3.75 | 6.74 | 40553 | 0.93 |
| 2b | 32.70 | 0.81 | 2.48 | 6.06 | 11632 | 0.27 |
| 2 | 51.26 | 2.43 | 6.02 | 12.54 | 52185 | 1.20 |
| 3a | 14.04 | 0.42 | 1.36 | 3.18 | 11415 | 0.26 |
| 3b | 2.03 | 0.30 | 0.56 | 0.99 | 3971 | 0.09 |
| 3 | 16.07 | N/A | N/A | N/A | 15386 | 0.35 |
| 4 | 2.55 | 0.88 | 1.31 | 1.93 | 5571 | 0.13 |
| 5 | 14.81 | 1.68 | 3.45 | 6.41 | 18821 | 0.43 |

A runoff model is developed to predict pollutant loading, including sediment, hydrocarbon, and excessive nutrients, to prioritize water treatment efforts. Stormwater modeling is used to prioritize treatment alternatives. Based on pollutant modeling predictions, Basins 1b and 2b are considered high-priority areas for improving water quality of stormwater draining to Odiak Pond. Recommended alternatives for improving water quality include treating stormwater flowing through vegetated ditches near Chase Avenue, addressing sediment transport at Artie Hanson’s lot, remediating the stream channel damaged from snow storage near the Copper River Highway, removing a wooden culvert at the Odiak Pond inlet, constructing a bioswale to treat runoff from the Cordova Community Medical Center, and addressing snow storage practices on the north shore of Odiak Pond.

Recommendations for further study that could be used improve pollutant modeling and predictions on the effectiveness of Best Management Practices alternatives include performing water quality sampling and monitoring, investigating potential pollutants at the capped landfill near Odiak Pond, collecting area specific street sweep data, collecting area specific snowmelt data, and developing a snow storage management plan.