Humboldt Bay and Watershed Symposium

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Salmon Creek has long been recognized as one of the most important salmon and steelhead producing tributaries to Humboldt Bay. The Salmon Creek watershed is typical of the north coast region where private land ownership in the watershed has resulted in intensive management of the land for timber production over the last five decades, or longer. Recently, the upper part of the watershed (formerly owned and managed by the Pacific Lumber Company) was publically acquired and is now managed for resource protection by the Bureau of Land Management. Much of the lower watershed is owned and managed for timber by Simpson Timber Company. The field inventory identified future sediment sources from approximately 57 miles of logging road in the watershed, including 57 miles on Simpson lands in the lower basin and 21 miles on former Pacific Lumber Company (now BLM) lands in the upper watershed. Database analyses for the Salmon Creek watershed identified a number of high priority, high yield abandoned roads and road segments that threatened to deliver large quantities of sediment to the stream system if they were left untreated. In Salmon Creek, a variety of treatments have been applied to prevent erosion and sediment delivery to stream channels from roads and other eroding areas. Erosion prevention work completed in 2000 - 2001 consisted of the permanent decommissioning of over 7.0 miles of high risk, abandoned logging roads located on the steep, unstable inner gorge slopes adjacent Salmon Creek and its tributaries. Road decommissioning work funded by the Department of Fish and Game, National Fish and Wildlife Foundation, Water Resources Control Board (EPA grant monies administered by Redwood Community Action Agency) and Simpson Timber Company is estimated to have prevented the delivery of over 25,000 yd^3 of sediment to the stream system from future erosion and road-related landslides at over 60 discrete inventory sites. In addition, complete topographic recontouring and landscape restoration of over 5.0 miles of road in the Headwaters Forest Reserve has provided both an increased level of protection and site restoration to sub-watersheds and streams in upper Salmon Creek.

Conclusion - As with each of the four major Humboldt Bay drainages that have been targeted for assessment, the implementation of upland erosion prevention and erosion control work is a very significant step toward realization of long term salmon habitat protection and recovery. In Salmon Creek, an additional 18 roads, totaling 8.45 miles and incorporating least 78 discrete erosion sites, are targeted for erosion prevention treatment over the next two years (2002 - 2003). All these roads are scheduled for permanent decommissioning and it is expected that at least 36,000 yd^3 of sediment will be prevented from being delivered to the stream system as a result of the restoration work that is planned. Storm-proofing (upgrading) of the remaining network of active, maintained roads (especially in the lower, privately owned and managed portion of the watershed), as well as restoration currently planned for the Salmon Creek estuary in Humboldt Bay, will also be needed before the full benefits of watershed restoration can be achieved. Elsewhere, erosion assessments have been completed, and treatment of road-related sediment sources is well underway, in two other major Humboldt Bay tributary watersheds (Freshwater Creek and Elk River). This work is being undertaken by the Pacific Lumber Company as a part of their approved Habitat Conservation Plan. In addition, on-the-ground treatments of upland areas in the Jacoby Creek watershed can be expected to begin soon after the 2002 erosion inventory and prioritized erosion prevention plan has been completed.

Disturbance by Pyrotechnics to a Waterbird Rookery on Indian Island in Humboldt Bay, California

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Indian Island in Humboldt Bay, California has been a continuously occupied rookery site of Great Egrets (*Casmerodius albus*), Snowy Egrets (*Egretta thula*), Great Blue Herons (*Ardea herodius*) and Black-crowned Night Herons (*Nycticorax nycticorax*) dating at least as far back as 1966. The area above Indian Island is also the site for the annual Independence Day pyrotechnics celebration for Eureka, CA, and many studies have shown that human disturbance may cause increased mortality in colonial waterbird nestlings. We quantified nestling mortality in the Indian Island rookery on the three nights preceding the pyrotechnics celebration, immediately after the pyrotechnics, and on the night following the pyrotechnics. We noted the frequency of general disturbance (flushing) of the rookery, and whether it occurred during the pyrotechnics. We also surveyed the rookery for the average number of Great Blue Herons, Great Egrets, Snowy Egrets, and Black-crowned Night Herons per night. Nestling mortality due to the pyrotechnics was equal to nestling mortality the previous night, and was greater than two other study nights by only one mortality. A general disturbance in the form of flushing was observed among the Black-crowned Night Herons when the pyrotechnics began. No other general disturbances were noted. Although this study indicated that nestling mortality was not greater than average due to the pyrotechnics that particular night, studies of more than one pyrotechnics event should be performed in order to more accurately determine the effects of pyrotechnics on waterbird nestling survival.

Ebb and Flood Dynamics at Humboldt Bay, California

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Humboldt Bay comprises two distinct bays (Arcata Bay to the north, South Bay to the south) which are connected by a long thalweg. Overall, Humboldt Bay is relatively well-mixed vertically, although horizontal gradients in water properties are often observed from the ocean to deep within the bay. Several drifters, drogued at 1.5 m below the surface, were released from sites north and south of the Humboldt Bay entrance over the course of an ebb tide. Within one hour of low tide, flow from Arcata Bay was faster than South Bay by a factor of 2-3, with peak flow speeds reaching 75 cm/s. In addition, drifters from Arcata Bay were transported across a wide area within the entrance, while those released from South Bay were held close to the south jetty. This pattern continued until roughly one hour before low tide, when flows from both bays became comparable. We suggest the most likely cause for this evolution is the large difference in tidal prisms for Arcata and South Bay and the location of the main (dredged) navigational channel, which runs alongside the south jetty near the bay entrance.

We also attempted to determine whether or not a portion of an ebb plume returned to the bay on the subsequent flood. To identify and differentiate plume and ocean waters, several