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Pacific Ecosystem Management and Restoration: Applying Traditional and Western Knowledge Systems

Poster Session: ***Ecological Restoration***

P-37 Stealth Sediment: Reducing Hydrologic Connectivity and the Impacts of Fine Sediment Delivery for Watershed and Coral Reef Restoration

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Fine sediment, whether in suspension or settled, negatively impacts aquatic ecosystems. In Hawai‘i, fine sediment delivered from upland (*mauka*) sediment sources suffocates and can eventually destroy downstream (*makai*) freshwater stream, wetland and estuary habitat (DBEDT, 2006), and offshore coral reefs (Wolanski, et al., 2009). Certain aquatic species and ecosystems are highly susceptible to fine sediment impacts. Management actions that reduce anthropogenic sediment loading in streams can produce immediate biological and water quality benefits. Where roads, construction sites, and agricultural lands are hydrologically-connected to stream channels, chronic surface erosion will result in fine sediment delivery and impacts to aquatic habitat, wetlands, estuaries and coastal reefs. Roads are connected to streams primarily through direct routing of turbid surface runoff. Our field inventories in coastal Oregon and California typically show 35% to over 75% of a road network is directly plumbed into the stream system. Depending on site conditions, each mile of connected road can annually deliver over 30 tons of fine sediment. Total Maximum Daily Load studies in Hawai‘i indicate that similar practices have significantly elevated fine sediment loads and turbidity in receiving waters. Reducing hydrologic connectivity here is essential to protecting and restoring water quality and aquatic health. We describe two strategies to reduce fine sediment delivery and its impact: *reducing site erosion*, and *reducing delivery* of eroded sediment to streams. Management practices that reduce hydrologic-connectivity or maximize filtering of runoff are the most effective treatments. We show how a variety of practical drainage treatments can reduce hydrologic connectivity by 90%.