

Clopyralid Drift Following Aerial Application at Fort Hunter Liggett, Monterey County, California

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An herbicide drift study was conducted during a clopyralid application for yellow starthistle (*Centaurea solstitialis*) control at Fort Hunter Liggett, Monterey County, California. This study provided the opportunity to closely monitor an application with high potential for drift of clopyralid into adjacent vernal pool and stream sites. A 30-m buffer was established along Stony Creek and around vernal pools not supporting larval salamanders, while a 200-m buffer was established around pools supporting salamander larvae. Using ArcView[®] GIS software, sites were mapped into shape files for use with on-aircraft Trimble[®] navigational GPS to help the helicopter pilot identify buffer zones. Both land-based (inside both treatment and buffered areas) and water samples were collected for drift analysis. Clopyralid was not detectable in any of the water samples taken in Stony Creek. Within the treatment zone the average amount of clopyralid detected on a filter disk was 7.8 μg (equivalent to 172 $\mu\text{g}/\text{m}^2$). 30 m from the stream, clopyralid was found at 93% of the rate found in the treatment zone. The rate of clopyralid had dropped to 8% of the treated area 10 m away from the border. At the stream edge (30 m from the treatment zone) the rate of clopyralid was only 0.6% of that found in the treatment zone. Clopyralid was not detectable in vernal pools 1 and 4. In vernal pools 3 and 5, clopyralid was at the lowest detection limit (0.05 ppb), equivalent to 0.6% of the amount of herbicide in the adjacent treatment zone. Only vernal pool 2 had a significant amount of detectable clopyralid (3.2% of the treatment zone). Pilot error led to treatment of the downwind buffer of pool 2 and the buffer zone of pool 5, thus accounting for the detection of clopyralid. In general, drift potential for clopyralid was minimal even with aerial application and a slight breeze (<5 mph). Buffers of 30 m provided adequate drift safety. Nevertheless, it is important to minimize application error, particularly accidental encroachment into buffer zones, to ensure that movement of herbicide to water sources is minimized.