

## APPENDIX F

### Pesticide Application Best Management Practices

Application of pesticides requires site specific assessment, taking into account a variety of factors including the nature and density of the pest to be controlled, the timing, weather and soil conditions, the proximity to water courses, drainage patterns, and the sensitivity of species not targeted for control or elimination through the application of pesticides. Listed below are a number of best management practices and considerations intended to guide the application of pesticides in watersheds supporting anadromous fishes. For up-to-date information on pesticide use in California see California Department of Pesticide Regulation 2012a, 2012b; for mosquito control best management practices, see California Department of Public Health and Mosquito and Vector Control Association of California 2010:

- Select the lowest toxicity pesticide necessary to control the targeted species. Research the products by consulting Material Safety Data Sheets, EPA registration documents, or other sources of information that provide ecological toxicity data (*e.g.*, No Observable Effect Concentrations (NOEC), Lethal Concentration 50% (LC50)). Avoid using materials for which such data are unavailable.
- Apply pesticides in a manner that prevents migration from the application area and exposure of listed anadromous fish and their habitat components (*e.g.*, aquatic invertebrates or native riparian plant species).
- Applications within riparian areas (*e.g.*, for invasive plant control) should be made with backpack sprayers, hand-held wands or other devices that give the applicator maximum control of the spraying. If this is not possible, apply the product using the largest droplet size possible to control drift. Have a dedicated observer to monitor for drift of the pesticide.
- Use a non-toxic dye to assist in identifying spray coverage and pesticide drift whenever needed.
- Use a hand-held anemometer or on-site weather station to monitor wind speeds during applications. Do not rely on visual estimation methods.
- Whenever possible, apply pesticides when listed species are not present, and maximize avoidance of reproductive or juvenile life-history stages.
- Avoid indiscriminate drifting of pesticide products into riparian areas or waterways. If applying to properties adjacent to water bodies with anadromous fish, ensure sufficient riparian vegetation is present to serve as a screen against potential drift.
- Utilize aquatic approved formulations of pesticides rather than terrestrial formulations in riparian areas or where pesticide drift into a water body may occur.
- Capture all runoff from areas using higher levels of pesticides (*e.g.*, some agricultural crops, golf courses) and

retain the runoff long enough for the pesticides to degrade to safe levels. Treat runoff if necessary through aeration or other means. Settle out and retain sediments if possible, or selected pesticides.

- Use non-chemical control methods (*e.g.*, cleaning orchards of fallen or leftover fruit to prevent overwintering of pests) to minimize pesticide applications.
- Monitor for pests before spraying to ensure that the application of pesticides is necessary.
- Avoid adding adjuvants such as surfactants (*e.g.*, R-11, polyoxyethyleneamine (POEA)) or synergists (*e.g.*, piperonyl butoxide (PBO), N-octyl bicycloheptene dicarboximide (NGK 264)) to the pesticides' active ingredients unless toxicity information for these adjuvants is known and they can be safely used. Adjuvants may be more toxic to nontarget organisms such as fish and aquatic invertebrates than the pesticide active ingredient itself.
- To select the least toxic alternative, research the toxicity of adjuvants in a manner similar to the active pesticide ingredient.
- Avoid broadcast applications of pesticides to large areas or areas bordering impermeable surfaces. Utilize spot treatments.
- Promote careful use of granular formulations of pesticides when they are needed, especially by the general public. Pesticide concentrations are often highest

immediately downstream of urbanized areas. Replace granular applications with other methods (*e.g.*, spot treatments for weeds, spraying around the foundation of a building as an insect barrier rather than treating the entire property).

- Avoid the application of pesticides within 48 hours of predicted rain. (This timeframe may vary greatly depending upon the pesticide selected.)
- Avoid "water-in" granular pesticides to lawn or turf applications if another application type (*e.g.*, spray products) can be utilized. Avoid generating pesticide runoff.
- Avoid planting or promoting known invasive plants such as Giant Reed (*Arundo donax*), Tamarisk (*Tamarix ramosissima*), Water primrose (*Ludwigia uruguayensis*), Water hyacinth (*Eichhornia* spp.), Cape ivy (*Delairea odorata*), Creeping myrtle or Common periwinkle (*Vinca minor*), Pampas grass (*Cortaderia jubata*), Spanish broom (*Spartium junceum*), *etc.* that frequently become the target of control programs using herbicides.\*
- Consult and coordinate with licensed Pest Control Advisors in the development of Integrated Pest Management Plans that include multiple strategies addressing cultural, mechanical, biological, and chemical controls.

\*For a periodically up-dated list of invasive plants identified by the California Invasive Plant Council see: [www.cal-ipc.org](http://www.cal-ipc.org).