

## **Control Options for Floating and Emergent Aquatic Species**

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Emergent and floating aquatic plants pose a significant proportion of the nuisance problems encountered in aquatic environments. Emergent plants, which are rooted in the bottom underwater but have leaves that extend into the air, are exemplified by plants such as cattails, bulrush or tule, and giant reed (*Arundo*). Some floating-leaved plants are rooted in the bottom, with leaves floating on the surface. Some examples of these plants are yellow floatingheart, fragrant waterlily, and yellow pondlily. Free-floating plants are typically not rooted in to the bottom, and the plant floats freely in the water, allowing these plants to readily disperse. Free-floating plants in California include duckweeds, waterhyacinth, South American spongeplant and mosquitofern. A final group of interest are mat-forming species, which form dense mats of tangles stems which may have emergent stems from the mat. This group includes waterprimrose, alligatorweed, and waterpenny. Common species in California will be reviewed, and the ecological and economic issues of their growth discussed. Management options for these species include biological, chemical, mechanical and physical approaches. Few biological control options are available for aquatic plants in California. While there are 16 or more active ingredients labeled for aquatic use by the US EPA, there are severe restrictions imposed on their use in the State of California by various and sundry regulatory agencies. If using a foliar application of an herbicide, be sure to also include an approved surfactant or adjuvant. Mechanical control options include harvesting, hand pulling or cutting, mechanical cutting, and a wide variety of specialized machines. Physical control options alter the environment to limit plant growth, and include dredging, drawdown, shading and nutrient inactivation. An overview of pertinent management options in California will be discussed, and their various merits and demerits mentioned. When possible, scientific evidence for potential techniques should be weighed as part of the evaluation process.