APCRP: Factors Influencing the Spread, Establishment, and Management of the Invasive Ludwigia Species

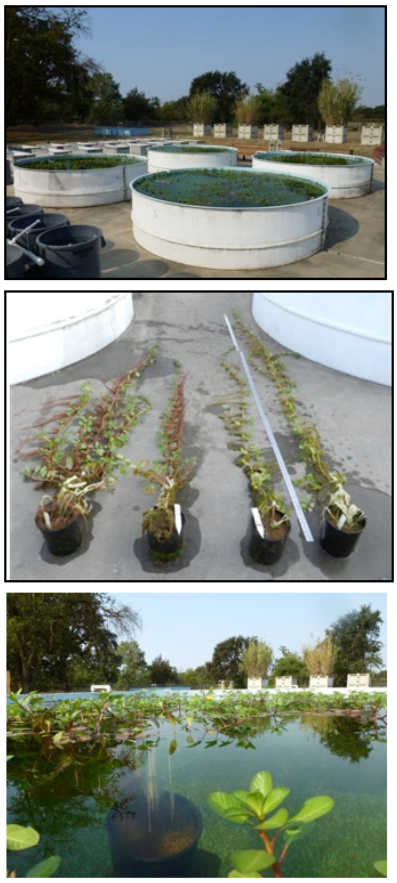
Capability

The invasive exotic plant *Ludwigia* is rapidly spreading throughout the Russian River in California. This pattern of expansion is being repeated in many other sites in both California and Florida.

Recent aggressive spread of two invasive *Ludwigia* species (Family: Onagraceae *Ludwigia hexapetala* and *Ludwigia grandiflora*) has impacted aquatic and riverine ecosystems in the Pacific West states and Florida. *Ludwigia* taxa are considered among the most aggressive plant invaders in the world and the recent rates of invasion in both the West Coast and Florida are of significant concern to both managers and researchers. These emergent aquatic weeds rapidly form dense floating mats that degrade water quality, increase flood risk, alter fish and wildlife habitat (including those of endangered species), and displace native vegetation. It has been established that the invasive *Ludwigia* species in California and Florida are polyploids (decaploid and hexaploid), and this may partially explain the invasive nature of these plants. As pressure increases to manage *Ludwigia* in different aquatic environments, there is a need to develop baseline biology and management data for these species to optimize control efforts in a variety of lotic and lentic sites. There is currently no consensus on best management practices for *Ludwigia* control.

Rapid expansion of *Ludwigia hexapetala* on the Russian River in California and continued expansion in the Sacramento/San Joaquin Delta as well as at numerous other sites in California, Oregon, and Washington has western water resource managers taking note. A similar rapid expansion of *Ludwigia* has been observed in Florida on the St. John's River, the Kissimmee Chain of Lakes, and the Kissimmee River Restoration site. Continued expansion of invasive *Ludwigia* into restoration projects such as the Sacramento Delta and the Kissimmee River, and acquired lands under the Comprehensive Everglades Restoration Program (CERP) looks to be inevitable.

As aquatic *Ludwigia* species increasingly invade and displace critical habitat and degrade a range of aquatic and riparian ecosystems, we suggest a comprehensive research approach to develop and demonstrate relevant management strategies to counter this growing problem. While water primroses have been present in the United States (U.S.) for decades, the recent rate of spread in crucial water bodies in states such as California and Florida, and the longer-term experience in Western Europe, is of significant concern. How should we respond to a rapidly emerging problem in the midst of numerous other invasive plant priorities? Research to address these questions will allow for improved decision making by resource managers, policy makers, and stakeholders throughout Pacific, Gulf, and Atlantic coastal states.



Mesocosm studies to determine factors that promote invasive *Ludwigia* growth can generate information that resource managers can use to determine sites that are at risk of invasion. These mesocosm systems also allow for evaluation of various management strategies that can be further tested at the field scale.

Applications

This research project is being conducted in conjunction with the U.S. Department of Agriculture (USDA) Agriculture Research Service in Davis, CA. Determination of factors influencing the growth and spread of these *Ludwigia* species (i.e., invasion biology and invasion ecology) will be key in providing resource managers with improved strategies for promoting selective control of these invasive plants.

Status

This research is being funded by the Aquatic Plant Control Research Control Program. This work was initiated in FY14 and is scheduled to run through FY17.

Documentation and References

B.J. Grewell, M.D. Netherland, and M. S. Thompson. 2015. Establishing Research and Management Priorities for Invasive Water Primroses (Ludwigia spp.). Government Publication/Report

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Article Sources and Contributors

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