1023-92-110   **Daniel L Kern*** (`kernd@unlv.nevada.edu`), Dept of Mathematical Sciences, 4505 S Maryland Parkway, Box 454020, Las Vegas, NV 89121, and **Suzanne M Lenhart** (`lenhart@math.utk.edu`). *Optimal Flooding and Native-Invasive Plant Population Dynamics.*

This work examines a two-species competition model with flooding as a control variable. Flooding in arid or semi-arid regions is often critical to the life-cycle of native plants; without it invasive species have a opportunity to displace native ones. A question, then, is whether the restoration of flooding disturbance can restore a native plant as the dominant species - and without excessive economic damage to human development. The model, based on a somewhat simplified version of cottonwood-tamarisk population dynamics, is a system of partial differential equations where some of the parameters are control dependent. The cost functional balances the economic impact against the desire to maximize the native population. The control is constrained such that it can not exist outside of a limited time. The sensitivities and the adjoint system are used to find the optimal flooding at various times. (Received July 31, 2006)