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### ***SOUTHWEST RANGELAND INVASIVE PLANTS INITIATIVE***

**OBJECTIVES:** Three primary goals are defined for this project: 1) Raise public awareness of the economic and ecological threats of invasive plant species in the Southwest U. S., 2) Encourage citizens to participate in invasive plant monitoring, control and prevention efforts, and 3) Strengthen the institutional infrastructure for invasive plant management in the Southwest. Research and extension programs will be designed to address economic, social, psychological, cultural, and institutional infrastructure questions and issues that are pertinent to the development of community-based, grassroots weed management efforts. Research findings will contribute to the evaluation of the overall success of the project, and will help guide future Extension efforts. Economic objectives are to: 1) Perform a cost-effectiveness analysis for an integrated weed-management program on a given landscape, and 2) Perform a benefit-cost analysis on the entire landscape using the least-cost-plus model. Social/Psychological/Cultural objectives are to: 1) Determine the type and level of involvement of each kind of group in invasive plant management, 2) Identify the factors that lead to increased involvement and effectiveness in invasive plant management by citizens' groups, or that deter involvement, 3) Identify the most effective methods of recruiting and training citizens in different types of groups for invasive plant management, 4) Identify individual characteristics and institutional and situational factors that lead to sustained participation in community-based resource management generally, and invasive plant management specifically, 5) Determine how well each type of group is integrated into local and regional institutional frameworks for invasive plant management, and 6) Evaluate the success of Extension programs aimed at recruiting and training citizens' groups in invasive plant management. Institutional Infrastructure objectives are to: 1) Increase the speed and efficiency which new invasions are reported and mapped, 2) Improve planning and coordination to promote rapid and effective responses to new infestations, and 3) Achieve these objectives by integrating community groups and volunteer rapid response teams into the institutional framework for invasive plant management.

**APPROACH:** We propose a multi-disciplinary, multi-institution, multi-state outreach and research project that will evaluate low-cost, community-based approaches to management of invasive plants. Research will address economic, social, psychological, and institutional infrastructure questions and issues that are pertinent to the development of community-based, grassroots weed management efforts. Results of this research will be used to develop and expand extension programs that are specifically tailored to constituencies, policy contexts, and invasive plant threats affecting range and forestlands in the Southwestern United States. However, the general conclusions and methods can be applied to extension activities in any U.S. location or for any agricultural land type where plant invasions are incipient or thought to be imminent, but have not yet reached epidemic proportions. The desert Southwest (Arizona, New Mexico, southern Utah and southwestern Colorado) contains some of the most biologically distinctive, visually striking and nationally treasured landscapes in North America. Plant invasions in this region - defined ecologically by the Sonoran, Chihuahuan, and Colorado Plateau deserts and their associated grasslands, mountains, and riparian areas - occur widely but have not yet changed these landscapes as in regions to the north and west. However, rangelands in the Southwestern U. S. are threatened by large-scale invasions: yellow starthistle (*Centaurea solstitialis*), leafy spurge (*Euphorbia esula*), and spotted knapweed (*Centaurea maculosa*) have all been identified in the region and Russian knapweed (*Acroptilon repens*) has been reported in more than half of the region's counties (Mullin et al. 2000). Due to the relatively recent and small-scale nature of these invasions, we believe the opportunity exists to eradicate existing infestations and effectively prevent future invasions using timely, low-cost early detection and control strategies. However, because invasive plants have not yet permeated our ecosystems, public awareness of the threat is low and the institutional infrastructure and fiscal resources for invasive species management are weak (Cramer 1995). The technical knowledge exists to control invasive plants in the Southwest. What we lack are effective means of educating and mobilizing the public to act. This initiative will provide social, psychological, and economic research essential to developing extension programs that will expand public awareness and community involvement in invasive species management. It will also identify ways to improve coordination among local, state, and federal authorities, thus addressing the goal of the President's Executive Order on Invasive Species of February 1999.

**NON-TECHNICAL SUMMARY:** This is a multi-disciplinary research and cooperative extension project that will promote and evaluate low-cost, community-based approaches to managing invasive plants in the Southwestern U.S. Research projects are designed to answer economic, psychological, and cultural questions pertinent to the development of collaborative stewardship for integrated weed management. Research results will guide the development and expansion of extension and outreach programs that are specifically tailored to local constituencies, policy contexts, and invasive plant threats affecting range and forestlands in the Southwestern U. S. However, our general conclusions and methodologies can be applied throughout the U. S., wherever incipient or imminent plant invasions have not yet reached epidemic proportions.

**PROGRESS: 2001/01 TO 2001/12**

This is a multi-disciplinary research and cooperative extension project that will promote and evaluate low-cost, community-based approaches to managing invasive plants in the Southwestern U.S. Research projects are designed to answer economic, psychological, and cultural questions pertinent to the development of collaborative stewardship for integrated weed management. Research results will guide the development and expansion of extension and outreach programs that are specifically tailored to local constituencies, policy contexts, and invasive plant threats affecting range and forestlands in the Southwestern U. S. Several surveys on invasive plant management have been designed. One was pilot tested and sent to some 50 local invasive plant management organizations, including county programs, weed management areas, weed districts and volunteer groups in the Colorado Plateau and Southwest desert regions of Arizona, New Mexico, Utah and Colorado. To date 72 % of the survey recipients have responded, data has been entered into a database, and preliminary analyses have been conducted. We expect to complete survey analysis by early 2003. Another survey was developed to measure Southwest citizens knowledge about weeds and weed management, their attitudes toward weeds and management methods, and their willingness to participate in volunteer weed management activities. Separate surveys were designed for different parts of the Southwest with different invasive plant problems (southern Utah, northern/central Arizona, southeastern Arizona, southern Rockies). These surveys were then mailed to 2,700 citizens in the region. Survey administration was completed in Summer 2002, and detailed analysis is now under way. Extension programs have included a 2-day Arizona Noxious, Invasive Plant Summit held in Tucson in April 2002, and a 3-day Noxious, Invasive Plant Short Course held in Farmington, NM in late July of 2002. One of the outcomes of the Summit was to initiate the development of a Strategic Plan for Noxious, Invasive Plant Management for the state of Arizona. A web site is being developed that will chronicle the results of our research and extension projects. Another Short Course is being planned for July 2003.

**IMPACT: 2001/01 TO 2001/12**

We expect our survey data will provide the first systematic and quantitative description of the different types of local weed management organizations working in the southwest, and enable us to assess the relative effectiveness of groups with and without the participation of county government, multiple agencies, and citizen volunteers. These results should be useful in guiding invasive plant policy and efforts to organize community-level weed management groups. As a result of the Arizona Noxious, Invasive Plant Summit we have begun to show weed managers across the region what citizens knowledge and attitudes currently are, how those attitudes are formed, and what their consequences are for improving weed management.

**PUBLICATIONS: 2001/01 TO 2001/12**

Brunson, M. and M.E. Fernandez-Gimenez. 2002. Factors influencing public acceptance of actions to enhance rangeland sustainability. Abstract and paper presented at the

International Society for Range Management meeting in Kansas City, MO, February 16, 2002.

Hershdorfer, M., M.E. Fernandez-Gimenez, L. Howery. Community-based weed management on southwestern rangelands: proposal for a comparative study. Abstract and poster paper presented at the Society for Range Management Annual Meeting, February 13-19, 2002, Kansas City, Missouri.

Sommers, W. D., M. W. Brunson, M. Fernandez-Gimenez, J. Gleason, N. Haynes, M. Hershdorfer, L. D. Howery, and R. D. Lee. 2002. The Southwest Rangeland Invasive Plants Initiative. Abstract and poster paper presented at the Ecological Society of America meeting in Tucson, AZ, August 6, 2002

Tidwell, L.S., and M.W. Brunson. 2002. Public knowledge, willingness to volunteer, and attitudes toward weeds in the Desert Southwest. Abstract and paper presented at the Society for Range Management Annual Meeting, February 13-19, 2002, Kansas City, Missouri.

Tidwell, L.S., and M.W. Brunson. 2002. Attitudes and knowledge about invasive plants in the U.S. Southwest. Abstract and paper presented at the 9th International Symposium on Society and Resource Management, June 2-6, 2002, Bloomington, Indiana.

Tidwell, L.S., and M.W. Brunson. 2003. Community-based management of invasive plants: Behavioral intentions and willingness to volunteer in management efforts. Abstract and paper presented at the Society for Range Management annual meeting, Feb. 1-6, 2003, Casper, Wyoming.

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