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Aquatic Invasive Species as Hazards on Water Resources and Ecosystems in Texas

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Invasions by plants, animals, and pathogens, are regarded by biologists as one of the major threats to biological diversity worldwide and can have major impacts on water resources and economics. Here, we describe basic ecological research on aquatic exotic fish, gastropods, macrophytes and parasites in Texas and describe the applied/policy implications of that research. The research encompasses spatial and temporal dimensions, population dynamics, trophic studies, tracking and migration, abiotic tolerances, biodiversity and community structure and ecosystem function and conservation biology. The applied and policy implications involve interbasin water transfers, instream flows, aquifer management, sports fisheries, endangered species, water quality, restoration, law suits and public education. Economic impacts associated with scientific findings from the studies translate into millions of dollars per year for Texas. Ecological impacts show dramatic changes in aquatic communities, increased threats to biodiversity and altered ecological structure and function. Water losses due to invasive species cost Texas hundreds of thousands of acre feet of water per year, water unavailable for instream flows, irrigation and other human uses. Innovative, proactive ecological research and public and policy awareness and education initiatives are instrumental to preventing further invasions and managing existing exotic species impacts in Texas aquatic ecosystems. Water saved by curbing invasive species may be critical to future water planning efforts and coping with projected population growth.

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