

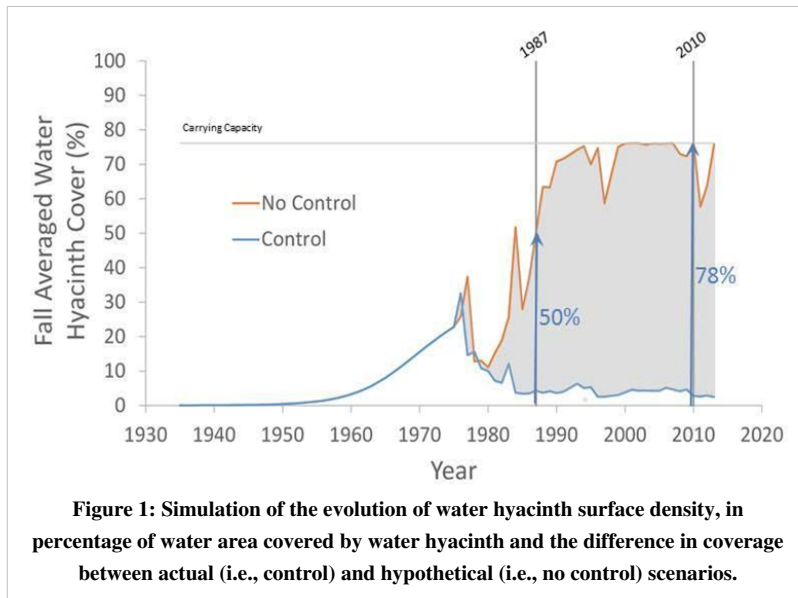
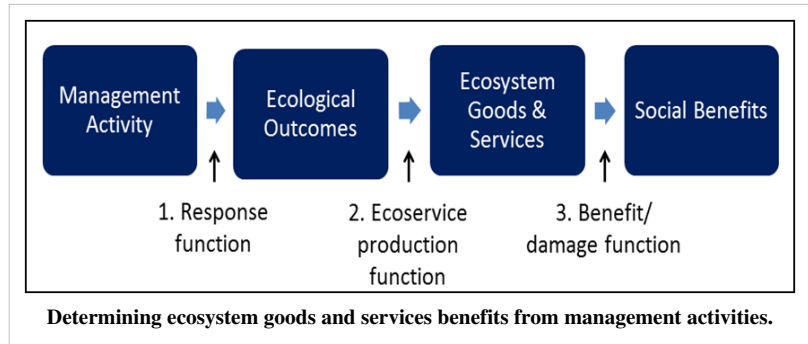
APCRP: Economic and Environmental Benefits of Invasive Aquatic Plant Management

Capability

Aquatic invasive plant (AIP) management in the U.S. costs upwards of \$100 million each year. Despite the substantial resources dedicated to AIP control, few ex post facto assessments are ever made to justify costs and report benefits related to management actions. These assessments are

especially rare on a large-scale basis due to (1) the disjointedness of management efforts often split between local, state, federal, and private entities, (2) the associated lack of adequate data or non-standardized data collected by various practitioners, and (3) the difficulty of determining and communicating non-monetary benefits (i.e., ecosystems goods and services (EGS)) obtained through management.

Several aquatic and wetland species have a long history of management in the U.S. with little recognized gain despite overall reductions in the problems associated with infestations. This is particularly true for water hyacinth (*Eichhornia crassipes*), a non-native invasive aquatic plant that forms free-floating mats, which can impede navigation, provide habitat for mosquitoes, and negatively impact a wide variety of aquatic organisms through shading and oxygen depletion. Over the last 40 years, practitioners in Louisiana have used a combination of biological control and herbicide application to reduce the extent of waterhyacinth infestation, though few detailed analyses have examined the long-term benefits of management.



The major objective of this work unit is to (1) develop an example analysis of benefits by quantifying EGS benefits that are impacted by invasive aquatic plant species and management, and (2) link research and development (R&D) activities to management efficacy and resulting ecological and economic benefits. To begin, historical waterhyacinth (*Eichhornia crassipes*) management in Louisiana was used as a primary test case. Currently, the case of flouridone-resistant hydrilla in Florida, its management costs, and the research that led to increased management efficacy is under

examination to demonstrate benefits of R&D for aquatic plant management

Applications

The waterhyacinth case study provides a straightforward assessment that is useful for understanding how to apply the EGS framework to aquatic plant management and suggests how future data collection can be modified to support economic analyses. Additionally, this work gives decision-makers the tools necessary to objectively assess future invasive aquatic plant R&D needs and objectives.

Status

This work is ongoing and funded through FY18.

Documentation and References

- Nesslage et al. 2016. Quantifying the population response of invasive water hyacinth, *Eichhornia crassipes*, to biological control and winter weather in Louisiana. *Biological Invasions*.

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- Magen, C, L Wainger, A McMurray, NE Harms. In review. Ecosystem service benefits of waterhyacinth control in Louisiana.
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Impact	Affected Users/Entities	Cost of Impact (~1,000 \$2010/year)	
		1987	2010
Recreational freshwater fishing	583,483 anglers	\$412,872	\$675,512
Recreational waterfowl hunting	19,400 waterfowl hunters	\$5,159	\$8,335
Boat-related businesses	400 marinas (Southern Louisiana only)	\$4,550 – \$8,050 ¹	\$5,200 – 9,200 ¹
Drinking Water Supply	77 drinking water intakes	\$59 - \$210	\$83 - \$295
Total		\$424,466	\$691,236

Table 1. Summary table of EGS costs due to waterhyacinth in Louisiana.

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